



House of Commons
Environment, Food and Rural
Affairs Committee

**Bovine TB: badger
culling**

Sixth Report of Session 2005–06

Volume II

Oral and written evidence

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Environment, Food and Rural Affairs Committee

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Contacts

All correspondence should be addressed to the Clerk of the Environment, Food and Rural Affairs Committee, House of Commons, 7 Millbank, London SW1P 3JA. The telephone number for general enquiries is 020 7219 5774; the Committee's e-mail address is: efracom@parliament.uk.

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Mr Tim Bennett, President, and Mr Meurig Raymond, Vice President, **National Farmers Union** and Mr David Williams, Chairman, and Mr Trevor Lawson, Media Adviser, **Badger Trust**

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Oral evidence

Taken before the Environment, Food and Rural Affairs Committee

on Tuesday 7 February 2006

Members present:

Mr Michael Jack, in the Chair

Mr David Drew
Patrick Hall
Lynne Jones
Daniel Kawczynski

Mrs Madeleine Moon
Mr Dan Rogerson
David Taylor

Memorandum submitted by Central Science Laboratory (CSL) (BTB 02)

Our interpretation of the scientific evidence is that the Randomised Badger Culling Trial shows that the two culling strategies tested will increase rather than decrease cattle TB breakdown rates. It has been suggested that by culling more efficiently the negative edge effects of culling might be reduced. However, there is no empirical evidence for this, and more efficient culling could extend the area of negative influence over a larger area by creating a greater vacuum effect. It is important to point out that the results of the Irish Four Area Trial need to be treated with caution and cannot be simply applied to mainland Britain. The option of intensive culling over areas large enough to eliminate the negative edge effects would clearly have substantial logistical and practical difficulties in implementation, apart from any considerations of cost, acceptability and sustainability.

The key question that needs to be addressed is whether there is any badger culling strategy that could be recommended on the basis of efficacy (ie reducing the disease in cattle, preferable without negative edge effects) that is practical, cost-effective, acceptable and sustainable?

January 2006

Memorandum submitted by the Independent Scientific Group on Cattle TB (ISG) (BTB 15)

SUMMARY

1. Over the next 12–15 months the ISG will be working towards finalising its scientific advice to Ministers to inform the development of an effective and sustainable policy to control TB in cattle.

2. We have already reported that localised reactive culling of badgers in response to TB being confirmed in a cattle herd was associated with an estimated 25% increase (95% confidence interval, CI: 2.6 to 52% increase) in the incidence of confirmed TB herd breakdowns, and concluded that reactive culling as performed in the Randomised Badger Culling Trial cannot contribute constructively to the control of bovine TB in Britain. We have also reported that a strategy of proactive culling of badgers indicates an incidence of confirmed TB herd breakdowns 19% lower (95% CI: 6.2 to 30% lower) in the proactive culling areas than in trial areas where no culling took place, but that analyses also revealed that the incidence of confirmed TB herd breakdowns was 29% higher (95% CI: 5.0 to 58% higher) on land neighbouring proactive culling areas, relative to land neighbouring trial areas where no culling took place.

3. Despite this evidence having been presented to Ministers in advance we are concerned to see that the badger culling consultation then proposed two strategies that scientific findings show will increase rather than decrease cattle herd breakdowns. Scientific evidence suggests that the third strategy option in the consultation—a general cull—could in principle reduce herd breakdown rates, but only if systematic and prolonged culling could be achieved, and over a larger area than that proposed (“at least 100 km²”). But this, in itself, presents serious implementation difficulties, and its cost effectiveness must be seriously considered.

INTRODUCTION

4. The ISG is a group of independent scientists who advise Ministers on how best to tackle the problem of cattle TB. Set up in 1998 following the acceptance by Ministers of the recommendations contained in the Krebs Report (1997), the role of the ISG is to provide the scientific evidence base for an effective policy to control TB in cattle.

5. The ISG’s Terms of Reference are to advise Ministers on the implementation of the Krebs Report on bovine TB in cattle and badgers by:

- (a) overseeing the design and analysis of the randomised trial to test the effectiveness of badger culling as a means of controlling bovine TB;
- (b) regularly monitoring the progress of, and outputs from, the trial and assessing any important differences in results between the treatments;
- (c) monitoring data on the *Mycobacterium bovis* situation in areas and species outside the trial;
- (d) reporting to Ministers on progress; and,
- (e) advising, as requested, on related issues.

THE RANDOMISED BADGER CULLING TRIAL

6. The Randomised Badger Culling Trial (RBCT), one component of the research effort put in place by Defra on the advice of the ISG, and which we have directed since 1998, is now nearing completion: the badger culling programme ended in 2005 and the final trial surveys are in progress.

7. The RBCT was designed to test the effect on the incidence of cattle TB of two different approaches to badger culling, each of which represented a possible policy option, as well as to provide a range of other epidemiological information.

8. The RBCT investigates 10 matched triplets each consisting of three trial areas of approximately 100 square kilometres. The 30 trial areas are located in areas of the highest TB incidence in cattle in England. Within each triplet, trial areas were randomly allocated to one of three experimental treatments: proactive culling; localised reactive culling in response to TB being confirmed in a cattle herd; or no badger culling (ie survey-only, this being the scientific control against which the findings of the other two treatments are measured). A calculation made when the RBCT was planned showed that the data from 50 triplet-years (eg 10 triplets over a five-year period) should provide sufficient precision to detect a reduction in TB incidence as small as 20%.

9. We have presented four annual reports and a number of progress reports to Ministers during the course of our study and plan for a final report, reviewing the trial and other related research, to be ready in 2007. This will conclude our work.

THE SCIENCE

10. From the outset the ISG has adopted a holistic approach, recognising that sustainable control policies could only be achieved through a better understanding of the epidemiology of TB in cattle and wildlife reservoirs. Implicit in our approach was the requirement to consider badger welfare issues related to the trapping and killing of badgers and that the widespread elimination of badgers from large tracts of the countryside would not be politically or socially acceptable. Hence we have sought to explore a much wider consideration of the problem and possible solution(s).

11. Statistical analyses of the effect of culling treatments have been undertaken at intervals since 2000 and the findings reported to the independent statistical auditor. Analyses of data on herd breakdowns up to 31 August 2003 revealed that reactive badger culling was associated with an estimated increase of 27% (95% CI: 2.4% decrease to 65% increase) in the incidence of confirmed herd breakdowns. This was the first time that any clear indications with potential implications for policy had emerged from the RBCT and, subsequently, Ministers decided that the reactive element of the trial should be suspended with effect from November 2003.

12. In October 2005 we published a paper “The impact of localised reactive badger culling versus no culling on TB incidence in British cattle: a randomised trial”.¹ The paper extended and supported the findings of our paper entitled “Impact of localized badger culling on tuberculosis incidence in British cattle”² published in *Nature* in December 2003. Our 2005 paper reported that localised reactive badger culling was associated with an estimated 25% increase (95% CI: 2.6 to 52% increase) in the number of cattle herds disclosing TB. This lent further support to the view that localised reactive culling, as carried out in the RBCT, could not contribute constructively to the control of bovine TB, and would make matters worse.

13. In order to meet the timetable of the 2005 Autumn Ministerial announcement the findings of the proactive element of the RBCT, based on data available up to 4 September 2005, were released earlier than we had planned. However, since data for only another five of the planned 50 triplet-years remained to be collected, the results were near final and certainly not considered to be either provisional or uncertain. Details of our correspondence and advice to Ministers and published papers in the period 5 September to 14 December 2005 can be found in the “Latest news” section of the ISG web site, under the “15 December 2005” heading.³

¹ Andrea M. Le Fevre *et al.* Available at <http://www.defra.gov.uk/animlh/tb/isg/pdf/lefevre1005.pdf>

² C A Donnelly *et al.*, *Nature* 2003 426 834–837 doi:10.1038/nature02192

³ <http://www.defra.gov.uk/animalh/tb/isg/index.htm>

14. The findings reported to Ministers were subjected to stringent peer review and published in *Nature* in December 2005 to coincide with the Autumn Announcement. That paper, “Positive and negative effects of widespread badger culling on tuberculosis in cattle”⁴ reported on the proactive element of the RBCT. The paper concluded that the incidence of confirmed TB herd breakdowns has been 19% lower (95% CI: 6.2 to 30% lower) in proactive trial areas than in survey-only trial areas. Analyses also revealed that the incidence of confirmed TB herd breakdowns was 29% higher (95% CI: 5.0 to 58% higher) on land neighbouring proactive areas, relative to land neighbouring survey-only trial areas.

15. A supporting publication “Effects of culling on badger *Meles meles* spatial organization: implications for the control of bovine tuberculosis”,⁵ published simultaneously in the *Journal of Applied Ecology*, demonstrated that culling badgers profoundly alters their spatial organisation as well as their population density, with badger home ranges found to be consistently larger in culling areas. These changes have the potential to influence contact rates between cattle and badgers, both where culls occur and on adjoining land. These results may help to explain why localised badger culling appears to have failed to control cattle TB, and should be taken into account in determining what role, if any, badger culling should play in future control strategies.

16. The wealth of other data, such as on pathology and infection prevalence in badgers, and spatio-temporal data, have not yet been fully analysed but these are expected to shed further light on our understanding of disease dynamics. Further analysis of cattle breakdown incidence and other data from the RBCT will continue throughout 2006 and early 2007, during which time we will submit reports to Ministers and prepare reports for publication in peer-reviewed scientific journals. We do not expect any major change in the outcome with respect to the decreased incidence inside culled areas (about 20% lower) and the increased incidence in neighbouring areas (the so-called “edge effect”) (about 30% greater) although there may be sharpening of confidence intervals.

17. The availability of new data (up to early December 2005) recently allowed us to update our analyses. These indicate a significant 20% reduction (95% CI: 8.5 to 31% lower) in cattle TB incidence within proactive trial areas, but a 30% increase (95% CI: 5.2 to 67% higher) in cattle TB incidence in areas neighbouring the proactive trial areas.

THE CONSULTATION

18. We have read with interest the consultation paper “Controlling the Spread of Bovine Tuberculosis in Cattle in High Incidence Areas in England: Badger Culling”. It contains valuable suggestions, but it is inaccurate in important respects. In view of this the ISG was obliged to write to the Parliamentary Under-Secretary (Commons) on 11 January 2006, in advance of a more detailed submission that the ISG will make later.

19. The comments in paragraphs 21 and 22 below closely reflect those contained in our 11 January letter to the Minister, and those in a letter we sent to a number of stakeholders and interested parties on 20 and 23 January, and in an open letter that we included in the delegates pack for our 25 January 2006 Open Meeting.

20. In particular there is solid scientific evidence that two of the culling strategies proposed will increase rather than decrease cattle breakdown rates, yet the consultation paper fails to make this finding clear. The remaining strategy, intensive culling over a large area and over an extended time period, could in principle reduce cattle breakdown rates, although clearly there are substantial logistical and other difficulties in implementing such a strategy.

21. At this stage the ISG is not in a position to offer specific comments on the questions asked in the consultation paper. Nevertheless, we would wish to make the following initial observations in respect of the scientific findings highlighted in the consultation paper, and have already made the same points to Ministers:

- (i) The findings of the analysis of proactive culling, and associated research, based on data available up to 4 September 2005, were released earlier than initially planned to meet the timetable for the December 2005 announcement. However only another five of the originally planned 50 triplet-years remained to be included and while some sharpening of the conclusions may be possible it is very unlikely that any major change will occur. The conclusions we reported should not be regarded as provisional or uncertain. The scientific findings were subjected to stringent peer review and published in highly respected scientific journals, *Nature* and the *Journal of Applied Ecology*. These findings clearly demonstrate that two of the proposed culling options on which stakeholder opinion is sought, licensed and targeting culling, would seriously worsen the situation;
- (ii) All of the culling strategies proposed would suffer from the edge effects described in the scientific papers and these would be maximal in localised culling, as envisaged in the option proposed for licensed and targeted culling. There are no scientific data to support suggestions in the consultation paper that targeted culling with coordinated farming groups would reduce the risk of perturbation

⁴ Christl A Donnelly *et al*, *Nature*, 2005, doi:10.1038/nature04454

⁵ R Woodroffe *et al*, *Journal of Applied Ecology*, 2005 doi:10.1111/j.1365-2664.2005.01144.x

or that culling efficiency would decrease the edge effect in non-culled adjoining areas. The suggestion in the consultation paper that the edge effect may be due to differences in cattle management in the different treatment areas is without foundation; and,

- (iii) The general cull strategy does have supporting scientific evidence if culling were to be conducted systematically over very large areas and, on a prolonged time scale. However the suggestion that 100 sq km is a big enough area is at variance with the scientific findings, which indicate a negligible impact overall when operated on this scale. It is true that the relative impact of the deleterious edge effect in un-culled adjoining areas would decrease as the size of the culled area increased. Systematic and prolonged culling extending to areas of 300 sq km or more could be expected to have an overall positive impact on cattle herd breakdown rates, if adequately resourced and coordinated to ensure high coverage, though the benefits may not exceed the costs. An informed cost benefit analysis is necessary.

CONCLUSION

22. The ISG has worked closely with Defra over the past seven years to provide what is now a solid base of scientific evidence for Ministers. Our findings provide an explanation for the failure of past TB control policies and contribute to a science base that is now robust enough, for the first time, to inform future cattle TB control policy. This evidence clearly indicates that two of the proposed culling strategies cannot be justified on scientific grounds.

23. Extrapolation from our results suggests that the general cull strategy could in principle have a positive impact, but presents serious implementation difficulties that would need to be overcome if this approach is to make a direct contribution to the control of cattle TB.

24. Further information on the ISG, our reports and the scientific evidence we have made available can be found on the ISG web pages at: <http://defraweb/animalh/tb/isg/index.htm>

February 2006

Witnesses: **Professor John Bourne**, Chairman, **Professor Christl Donnelly**, Deputy Chairman, and **Dr Rosie Woodroffe**, Independent Scientific Group on Cattle TB, **Professor H Charles J Godfray FRS**, Chairman, Independent Scientific Review of the Randomised Badger Culling Trial, and **Dr Chris Cheeseman**, Central Science Laboratory, gave evidence.

Q1 Chairman: Good afternoon, ladies and gentlemen. Before I formally welcome and introduce the first of the witnesses this afternoon, as they say, for the avoidance of doubt, I would like to remind everybody who has come today of the focus of this very short inquiry and evidence session. The terms of reference that we put out in our press notice said: "In conducting its inquiry the Committee intends to focus on the key questions that ministers must address in reaching conclusions on the issue set out in the consultation paper." I say that because, unsurprisingly, a number of people have been kind enough to send us their thoughts in the form of written evidence and they have gone somewhat wider in, once again, debating issues which this Committee has reported on more formally on a number of occasions, looking at the whole issue of bovine TB and the way in which policies can be developed to deal with it. That is not the focus of this inquiry, although, inevitably, it will touch upon some of those issues. I wanted to remind everybody that that is what we are about. Could I welcome, first of all, representatives of the Independent Scientific Group on Cattle TB: Professor John Bourne who has been kind enough to give us evidence on many occasions and we are grateful to you for coming again; Professor Christl Donnelly, the Deputy Chairman of the Group; and Dr Rosie Woodroffe. They are accompanied, from the Independent Scientific Review of the Randomised Badger Culling Trial, by Professor Charles Godfray, its Chairman, and from the Central Science Laboratory, by Dr

Chris Cheeseman. Dr Cheeseman, I do not know whether it will make you feel good or nervous, but you are sitting exactly where the Prime Minister sat earlier today when he gave evidence to the Liaison Committee.

Dr Cheeseman: The seat is warm!

Q2 Chairman: The seat is warm, that is good. There may be a little aura around you which may assist this afternoon. I know there are a number of you here and it may well be that one of you has been deputed to be the principal spokesman, but, if there is a question that comes up or a point that you want to amplify personally and you have not started the question, perhaps you would indicate to me by raising your finger or a pen and I will bring you in, because obviously there may be more than one view on it. I would like to ask whomsoever wants to respond to this question: Defra is a department which prides itself on making decisions on the basis of sound science. In the context of the decisions which the minister is consulting about, do you believe that still should be the case, that any decisions that are made in this area must be based on sound science?

Professor Bourne: I do not think there is any question that decisions should be based on sound science, but of course I do accept that scientific assessment is only one aspect of developing policy. Certainly the ISG¹, when we were asked to fulfil our

¹ Independent Scientific Group on Cattle TB.

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Professor H Charles J Godfray FRS and Dr Chris Cheeseman

role seven years ago, recognised at that time that the science base underpinning future TB policy control was lacking in many respects. With Defra, we have worked very hard and effectively over the last seven years to develop a science base based on high quality research. We are now in a position where the science base is in place—science which is focused on the badger issue and the cattle issue, but sound enough science to inform future policy. I have no doubt that that the science is strong enough to inform ministers, but I do accept it is just one aspect of development of policy.

Q3 Chairman: Clearly, you could say in respect of the questions which the Minister has put in the consultation document, that all of those could be answered with an objective, quality, scientific base.

Professor Bourne: As you know, we were occasioned to write to the Minister, having seen the consultation document. We were concerned that science had been misrepresented, and in fact two of the policy options on which stakeholders were being asked to comment were, on the basis of scientific findings, not appropriate; in the sense that, in our view, the scientific view, it made matters worse rather than going towards improving matters directly. You will notice I used the word “directly” in my letter to the Minister, and I used that word very purposefully.

Q4 Chairman: The Minister has listed what he thinks are the key questions to consult about on the question of whether to cull or not to cull. Are there any other questions that he should have posed in the consultation document? Putting aside for a moment the questions on which you have commented, are there any remaining questions which you think perhaps are either not well phrased or should not be asked? In other words, is he asking the right questions?

Professor Bourne: Seeing that the document was focused solely on the culling issue, he was asking questions solely about the culling issue, I think the right questions were asked. But, as I have already said, I think the consultation document was badly framed.

Q5 Chairman: Can you help me in terms of understanding. Each one of the questions laid out in the consultation document, in the way that it is posed, is given equal weight. The Minister does not attempt in the way that they are phrased to say this one is more important than that one. He will get a range of information, from objective opinion underpinned by science to subjective observations reflecting some of the emotion that is in this particular subject, but, when he comes to weigh these answers, are there some questions which are more important than others? If he is trying to determine where the weight of information comes, does he give all the questions equal weight or does he give some more weight than others?

Professor Bourne: I think the consultation document is imbalanced, in the sense that two of the options from the scientific perspective are simply not tenable.

Q6 Chairman: Would you remind us which those are.

Professor Bourne: That would relate to localised culling, involving licensing farmers individually, or targeted culling, where the expectation is to get farmers together and work as a cooperative, if you wish, and cull badgers out from, still, relatively small areas. Scientifically—which is why we felt obliged to write to the Minister—those are not supportable. The issue becomes whether widespread culling, which we accept—there is scientific evidence to suggest that could be tenable—but not on the scale that is proposed in the consultation document. The document refers specifically to 100 km² for the size of a trial area, and we have shown, on the balance of a protective effect within a trial area which is culled and the worsening effect on the edge of a trial area which is not culled, that over 100 km² there will be just about a zero impact—based, of course, on the culling efficiency that we are able to operate and the way we carried out the trial. So I think the question relates to a more extensive cull carried out systematically for a very prolonged time period. My view is that the consultation should have focused on that single question, rather than identifying questions, two of which, as I have said, are scientifically untenable.

Professor Godfray: I wonder if I could make a brief comment on the first question you asked and then a comment on what Professor Bourne has just said. We have an immeasurably better scientific base for making decisions about bovine TB than we had before the ISG started work, but I think it is important that ministers realise—and I think they do realise—that getting evidence about badgers, in particular, which are nocturnal animals that live underneath, is extraordinarily difficult, and so there will always be gaps in what the scientific base can inform ministers, and ministers have to make difficult decisions on imperfect scientific knowledge—even though, thanks to the people on this table, it is much better than it used to be. For the precise point you just asked Professor Bourne on the different questions, although I would not disagree with the broad answer that he gave you, I think I would temper it slightly and say the overwhelming evidence suggests that localised culling licensed for farmers or groups of farmers is unlikely to be a sensible approach—so a very slightly different nuance from Professor Bourne.

Q7 David Taylor: Professor Bourne just said that the option of culling over larger areas is just about sustainable, and Dr Cheeseman in his evidence implied that there would be some practical difficulties in sustainability. I would like to examine the difference between the two.

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Professor Bourne: I did say it would be supportable but it would need to be sustained over a long period and done systematically, and, as we have indicated in our letters to ministers and reports elsewhere, there are serious logistical problems that would need to be overcome to ensure that this was done satisfactorily.

Q8 David Taylor: Dr Cheeseman, did I quote you accurately?

Dr Cheeseman: First of all, Chairman, apologies for my voice—I will try to make myself heard. I think the key question—which I have put in my submission—that the Minister has to address is whether there is any badger culling policy that could be recommended on the basis of efficacy (that is, that reduces the disease in cattle, preferably without any edge effects) that is practical, cost effective, acceptable and sustainable. This question of sustainability is a key question. I would venture to suggest now that I do not believe that any culling policy is sustainable in the long term. There has to be a better way to control the disease. The Irish, if you recall, said that at the end of their paper. They have demonstrated a significant reduction in TB in cattle in excess of 50% but even they said culling of badgers is not a sustainable long-term option for the control of TB in cattle in Ireland.

Q9 David Taylor: So you depart from the ISG and Professor Bourne at that point on the question of sustainability, do you?

Dr Cheeseman: I do not think we depart. I think we are saying that sustainability is a key question that must be addressed—long-term sustainability.

Q10 Mr Rogerson: On the perturbation effects, is there any conclusive proof that is a factor?

Dr Woodroffe: There is very strong evidence to suggest a deterioration in the cattle TB situation close to/bordering culled areas. There is also very good evidence to indicate that there is some substantial disruption of badger populations and territorial behaviour and movement patterns which could plausibly increase contact rates between cattle and badgers. At present, the causal relationship between those two is not 100%, but certainly the ecological pattern is consistently there, the cattle pattern is consistently there and the relationship between the two suggests that that badger perturbation effect is currently by far the strongest candidate explanation for the effect we see in cattle. It is becoming quite broadly accepted by scientists that that is the case.

Q11 Mr Rogerson: In your opinion, do you think that should have consequences for the approach that Defra takes in terms of any culling strategy? We talked about area and—

Dr Woodroffe: I think it certainly should be taken into account, but I think it is very important to stress that the ecological explanation for the pattern that is seen in cattle is one thing—it is strong, but it is not 100%—but the fact that we see these unintended

negative consequences of badger culling on cattle TB is very strong, so, even if you did not know what the cause was, still you have the empirical evidence to suggest negative effects of culling and that certainly needs to be taken into account.

Q12 Mr Rogerson: Would that also have implications in terms of the efficiency of the culling method: making sure that if you are doing it you are doing it effectively?

Dr Woodroffe: I am really glad you asked that question. This is another concern we have with the consultation paper. The consultation document states that if a more efficient culling method could be used it would counter these edge effects, these perturbation effects. That statement is without any scientific support. Wherever badger culling has been performed and anybody has looked at what happens to the badger population, there is perturbation. That is true not only in the UK, where the badger removal has primarily been with cage traps, but also in Ireland, where snares have been used. You do see this disruption of badger populations also under snaring. If you were to use a potentially more efficient capture method, unless you have a geographic boundary that is impermeable to badgers you are still going to have edge effects.

Q13 Mr Rogerson: You have been critical of Defra's proposals. They have suggested that cattle management difficulties could be another cause for this effect potentially. Can you see any evidence of that?

Professor Bourne: That comment is without any foundation.

Dr Cheeseman: Chairman, I completely endorse everything Rosie Woodroffe has just said about perturbation and I would go further. I think the evidence now is more compelling for this being a serious issue in the context of control than it ever has been. It is something that is not new. We first recognised this over 20 years ago, when badger populations were removed in respect of TB outbreaks. We saw the exacerbated movements and we were even told by farmers at the time that this was the cause of a rash of outbreaks around control zones. We did sound warning messages at the time. It was a difficult concept, I think, for the Department to take on board then. But we have seen over the years various strategies being implemented with the disease slowly getting worse. I think there is very compelling evidence now that perturbation is possibly one very good reason for that. You have mentioned the efficiency of culling. I, again, agree with Rosie that if you cull more efficiently you do not necessarily reduce the perturbation effect; you may actually make it worse and create a bigger vacuum and you may pull badgers in from further afield and extend the zone of negative influence even further. I would finish by saying there is no linear relationship between culling efficiency and the degree of perturbation.

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Professor Bourne: When my committee reported two years ago, although we considered perturbation we did not think the evidence there was particularly strong. I agree completely with what Dr Woodroffe has said, that recent evidence the ISG have produced on the perturbation effect is extremely compelling, and, while the case is not proved, especially that disruption of badger social structure actually has a direct effect on the epidemiology, it is by a very long way the most plausible hypothesis out there at the moment.

Q14 Chairman: Could I follow up a point Mr Rogerson made—and this comes back to the science base. In the Defra consultation paper, they say “at this stage it is not possible to rule out other possible contributing factors such as cattle management differences between treatment of areas” and your reaction to that was that this was a suggestion “without foundation”. I presume that Defra’s questions are informed by sound science. How is it that their science takes such a diametrically opposed view or comes to such a diametrically opposed conclusion to yours?

Professor Bourne: I do not know the answer to that.

Q15 Chairman: You would not like to hazard a guess, would you—or is that not allowed?

Professor Bourne: I assumed it was associated with some misunderstanding of our interpretation of science that we obviously reported to Defra and was subsequently reported in the scientific paper in *Nature* and in the *Journal of Applied Ecology*. We were given an opportunity of commenting on the scientific component, which is two or three pages of the consultation document, only a few days before the deadline of December 15—I think it was one week before—and we had 48 hours or 72 hours to respond to that, and respond we did. Some of our response was accepted but much was not. That obviously was purposeful. I really think you need to ask Defra why they differed from our interpretation. I just do not know.

Q16 Chairman: That is fair comment. There was no feedback as to why there was this difference of opinion. Whilst we are talking about edge effects and perturbation, one of the areas, which I cannot see, but there is a question to be consulted on—and forgive me if I have misunderstood what is in here—is this question of the size of the area where Defra are proposing that culling should take place, because there was an indication given when the announcement was made that you could join together some of the areas. I was interested to know whether that is something that should have been consulted about. In other words, if you look at the incident rate in the South West, some might conjecture that you could join the whole of the South West together in a giant culling zone, but there is not any question in the document that tries to tease out what is the zone size, what is the optimum size. Is that something that should have been there?

Dr Woodroffe: I think it is important to think not only about the size but also the shape of the zone. If you are thinking about an edge effect, of course your edge is going to be smallest the closer you come to a perfect circle. That was one of the reasons we tried to make trial areas that were circular. One concern that one would have for allowing the culling areas to form naturally by agglomeration of smaller culling areas, is that you are going inevitably to end up with a culling area which may be large but it is going to be a very contorted shape, with a very high perimeter to area ratio, and you are therefore are running a risk of having an even more substantial edge effect than you would have otherwise.

Q17 Chairman: Do I interpret from that answer—I do not want to lead you to the conclusion—that there should have been something in the consultation document which would have allowed a debate about the nature and size of the culling area? As I say, it does not appear to be there.

Dr Woodroffe: I am not sure I would go that far. It is something that we have been cautious about extrapolating. We can tell you what happens if you cull over about 100 km². We have replicated that ten times and ten times the same thing happened, more or less. I think that extrapolating beyond that one has to do with greater caution. But the ecological patterns we see, both in localised culling and larger scale culling, do suggest that it is certainly an issue for serious consideration and concern.

Q18 Chairman: It might merit a question.

Dr Woodroffe: It might merit a question.

Q19 Daniel Kawczynski: On the point of the size of the area, have you at all looked into cross border areas? Of course my constituency is on the Welsh-English border, Shrewsbury, and I have farmers who own land on both sides of the border. I am just wondering whether the Government has spoken to you at all about crossing national boundaries.

Professor Bourne: No. When we agreed on the siting of trial areas, it was at that point agreed that they would be sited entirely within England with no areas in Wales at all. The decision of the Welsh Assembly at that time was that they did not want the trial area in Wales: if there was good, compelling scientific reason for a trial area to be in Wales, then they would consider it. Well, there was no good, compelling reason for the trial area to be in Wales and it was never considered. That is why they were all sited in England.

Dr Cheeseman: In relation to the size of the area, it is true that, as it gets bigger, the proportion of the negative edge effects will be smaller in comparison with the positive effects in the inside. But, unless you go to an area that is bounded by the sea or an area where there are no badgers or no cattle, you will always have that negative edge effect. I think it is true that in the consultation document it has not been satisfactorily aired as to how we can address that particular problem. It does not matter how big they might be—and I see no reason why they should not

cross national boundaries, county boundaries or any boundaries—they need to be constructed according to the disease pattern in cattle and, hopefully, some sort of natural geographical boundary that will stop its negative edge effect. But that is almost an unachievable goal.

Q20 David Taylor: I am not sure I accept what Dr Woodroffe said, that the optimum way of reducing the edge effect is a perfect circle. It does depend, does it not, on the topography of the areas being enclosed, the distribution of badger populations, the extent of urban fringe—all sorts of other factors. But that is just an observation. We have been dealing with perturbation and I think Defra are perturbed to a certain extent—if that is a rather weak link—in that they have put up three options which address the issue as they might see it, and, as we heard clearly from Professor Bourne in his opening remarks, the scientific community has come down quite heavily on individual licensing and targeted culling and has major reservations about generalised culls over large areas. If that is so, are the scientists saying that there is not a case for badger culling, or, if there is, what sort of cull would address the reservations that the scientific community have used in casting doubt over the three options the Government have come up with?

Dr Cheeseman: I think we would probably all agree that the only cull that would have an expectation of making a worthwhile impact on the cattle situation would be an extended, large-scale, continuous cull over several years, where the aim would be to remove 100% of the badgers and have full compliance, where there are no holes inside the culled area where farms are not culled out which would introduce further negative effects, and I suggest that is an extremely difficult thing, in terms of practical and sustainable issues, to achieve. So, yes, I think we all agree that very thorough widespread culling is an option that might reduce . . . You have to remember you still have a problem in the cattle themselves, so you will not completely eradicate the disease until you have eradicated it in the cattle population as well.

Q21 David Taylor: Professor Bourne, do you agree with that summary?

Professor Bourne: We have consistently interpreted the evidence to suggest that a general cull is supported by scientific evidence. But culling must be carried out systematically over very large areas for a very long time, several years. Dr Cheeseman has made the point that one has to question the sustainability of that, in the sense that it has to be continued certainly beyond the five years that we were involved with in the trial. But it does come down to a question of badger numbers: if you reduce badger numbers to a very low level by a general cull, you do reduce badger-cattle contacts—so the question becomes less of a scientific one and more of a political one. Science supports that if it is done systematically. One accepts that within culled areas there will be no-go areas. We accepted that in our

own particular trial: we knew there would be land we would not have access to; farmers would not cooperate. We did in fact find that we could cull only, on average, about 66% of the land in trial areas, but we still got an effect on cattle breakdowns of 20% by culling over the areas we did—and it is possible one may improve culling efficiency, but we do not know what impact that would have on further reducing cattle breakdown rate. You still have the edge effect, and by extending culling areas you dilute that out, and by reducing badger populations you further reduce the effect of perturbation. Could I ask my colleagues if they would like to add further to that.

Dr Woodroffe: Yes, I would like to. It also comes back to the issue you raised earlier about geographical boundaries. Professor Bourne talks about improving culling efficiency and I think it is very instructive to compare our findings with those from the Republic of Ireland, where two experimental studies were carried out. The one in East Offaly used snares, which are probably a more efficient way of removing badgers, and, whilst we are not confident of the badger densities in East Offaly and the Four Area Trial after the culling occurred, it appears that a more thorough eradication of badgers was achieved. The reduction in cattle TB incidence in East Offaly was about 26%, comparable with what we detected. When you read the papers, one of the things on which they commented was that badgers continued to immigrate into the area and they considered this a problem. That is one of the reasons, when they went to the Four Area Trial, that they chose areas that were geographically isolated, either by coastline or by major rivers, and under those circumstances were able to achieve greater reductions in cattle TB incidents, averaging about 58%. As Professor Bourne says, scientific evidence would suggest that if you do a very large cull, preferably in an area that is geographically isolated, then culling badgers can, under the right circumstances—at least as it appears from Ireland—contribute substantially. Unfortunately places like Gloucestershire are not geographically isolated, so how do you deal with that situation? I would like to add that I think the scientific evidence is suggesting, as Professor Bourne says, that a very large-scale, extensive, continued, well-maintained cull could contribute if it is done correctly. The question then of whether that is sustainable, in view of things like the Berne Convention and public perception and so on, is a political question; it is not a scientific question. But I would like to add that it is portrayed in the consultation document as culling badgers or doing nothing, and I think it is very important to stress that not culling badgers does not necessarily entail doing nothing: there are a lot of things that could be done.

Q22 David Taylor: All the contributors so far have made it clear, in terms of practicability and in terms of political impact and other factors, that there are serious reservations that you have—even if you also set aside economics and animal welfare and

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conservation considerations. Okay, if not culling, then is there some other optimum TB control policy which you can briefly suggest? I heard the Chairman say at the start of our session that this is a relatively narrow inquiry, but, if you are going to shoot down every option that comes over the horizon, is there some other, non-culling option perhaps which you think is preferable?

Professor Bourne: We are digressing from your remit but we are coming back to issues that we have discussed in the past with you. At the outset I indicated that we were determined to adopt a holistic approach to the whole problem, including work to give us a better understanding of the disease in cattle with respect to pathogenesis and epidemiology. One can state without any contradiction—and I think there is general acceptance now that you certainly would not have got five or six years ago—that there has to be an improvement in diagnostic testing, the strategic use of diagnostic testing, the complementary use of the gamma-interferon test, to avoid the large numbers of undetected TB infected animals that are present in the national herd at the moment. There is clear evidence of the movement of infected animals around the countryside which leads to the disease appearing in new areas—very clearly established over the last few years. There is a clear recognition of the importance of biosecurity. Defra have moved a long way in this regard, with respect to introducing tighter controls on testing timetables, and is also now introducing pre-movement testing of animals—which is directly related to bio-security, in preventing infected animals moving around the country. Added to that, there has to be a more realistic adoption of on-farm bio-security by farmers. Again, I have gone on record repeatedly by saying that government alone cannot control this disease. Much of the answer and many of the issues can be addressed only by the farming industry, by recognising that they are dealing with an infectious disease. It is foot and mouth in slow motion—in some cases, not so slow either. They have to recognise they are dealing with infectious disease and treat it accordingly. I do not think there is any demurring on that at all. I attended a meeting of the British Cattle Veterinary Association last Thursday and it was really heartening to me to recognise that 80% of the day was devoted to talking about cattle control. That would not have happened five years ago: they would have dismissed it.

Professor Godfray: Most of the points I wanted to make have been made, but, very briefly, I think there has been a reasonable scientific consensus, almost since Professor Krebs reported ten years ago, that badgers are a source and that if you remove badgers you will remove a source of bovine TB. The evidence has changed in the last couple of years: the null hypothesis that the more badgers you remove, the better the situation, no longer occurs. By doing a small cull or an inappropriate cull, you can make matters worse. That is a major thing that has changed in the last 18 months or so.

Q23 Mr Drew: Could I ask a question about the scientific basis of a large cull, inasmuch as the only experience we have that has been scientifically

evaluated—and there are doubts whether it was done properly—was the Thornbury experiment—which I know rather well because my constituency abuts it. We are moving from a situation currently of randomised badger culling to what is effectively indiscriminate badger culling. By the very nature of that, it is different from cattle. Apart from when there is whole herd removal, we only cull cattle where they are tested—they may be inaccurately tested, but tested—and subsequently we see lesions, we have some proof that they have bovine TB. In terms of badgers, with indiscriminate culling we will be killing clean badgers. Is there at least an issue there that you are killing out the immunity which some badgers will have to bovine TB? Are there dangers in that? Because eventually clearly we either have to vaccinate—which seems to be what the Irish have suggested—or we have to look at the way in which the wildlife reservoir breeds this disease out. There is a danger, is there not, of culling clean badgers?

Dr Cheeseman: It is one of the factors that needs to be taken into account when you are considering the sustainability. You are correct that culling is indiscriminate: it kills healthy as well as infected animals. After culling ceases, you have immigration and recruitment in the population, and that population will be naïve to disease, so you may have a worse picture down the road than before you actually culled. That needs to be taken into account in the long-term planning of these sorts of strategies. That is all I would say.

Professor Bourne: I find it difficult to answer that question. We do know from the literature that there is some evidence, in some bovine species, for instance, that there is a degree of resistance to TB, but there is no suggestion that any animal is totally resistant: if it is exposed to a TB organism, if it is given in the right place it will develop disease. I really cannot comment on the dynamics of the disease as it might be affected by culling, but I would like to comment briefly on the prevalence of the disease in badgers. Much of this work that has come from the Randomised Badger Culling Trial has yet to be published, but it will show a very large variation, both across space and in time, with respect to the prevalence in badgers, and it will range from something like 4% in some areas to perhaps 40% in other areas. We do, of course, with any diagnostic test, underestimate the prevalence, and there is work to suggest we could multiply both those figures by two. But I am persuaded that TB in badgers occurs over a very wide area, and, if you are going to tackle the badger problem, finding badger TB-free areas is going to be jolly difficult. Equally, of course, the comments I have made about the inadequacy of diagnosis—and we are talking here about diagnosis at post mortem—which relate to the badger also relate to the cattle. I add that point simply because of confusion in many people's minds created by the fact that only 50% of reactors are prone to carry TB. I think that is more an inadequacy of the post mortem procedures and growing bacteria than it is an inadequacy of the tuberculin test. I think the

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problem with diagnostic testing in cattle is not the false-positive you get but animals which are positive but which are falsely diagnosed as negative. I am rather digressing there but it gives you a picture of the complex dynamics of disease in the badger and in the cattle, much of which we do not fully understand.

Q24 Mr Drew: But that would suggest there is at least a possibility, if you choose the wrong culling strategy—given that you have already identified that localised culling could well be problematical—that it could make things worse rather than better.

Professor Bourne: It could. Not only that, you could change geographical boundaries as well if you involve yourself in wider-scale culling. Those are the factors that we can only guess at and we do not have data to support that. But one can consider that, yes.

Q25 Dan Rogerson: I was intrigued by your hypothesising over an area that is surrounded by the sea. As an MP in Cornwall, where we are virtually surrounded by water, with the River Tamar as well, and it is an area that has obviously been a real hot spot, is this something where you think that could be overcome, were there to be a cull across the county?

Dr Cheeseman: You could certainly define an area with geographical boundaries but you still have to overcome the internal problems of compliance. How you are going to catch all the badgers? As somebody who has spent 35 years using every method available to catch badgers, I can tell you that you will never get 100%. Unless you cull and eliminate badgers, you still have the problem afterwards of immigration and disease coming back, and, as I have said, a more naïve population, and you have the possibility of reservoirs in other wildlife, such as deer, that could re-infect the badger population. I just put to you that the practical difficulties of achieving eradication, never mind the acceptability and the sustainability, are huge and probably insurmountable.

Dr Woodroffe: I would like to add an additional comment, as somebody also from Cornwall, that our level of compliance in West Cornwall was the lowest of any of the trial areas. In that particular area, whilst geographically it looks very well suited to this sort of approach, the level of compliance with culling was the lowest that we experienced.

Q26 Chairman: Should the consultation document present people with some different scenarios? There has been an interesting debate about the effectiveness of different culling strategies, with an underplay of: “But there are other things we could do.” The one thing I do not derive from this document are trade-offs; in other words, if you culled and achieved a certain reduction of the incidence of bovine TB but at the same time increased your cattle movement testing, better bio-security and so on, what is an acceptable model? There are no alternative models put in there with, if you like, financial outcomes. In other words, you do not have a menu of choices. Should this document

have gone a bit further and given some alternative strategic options rather than simply focus on questions about culling?

Professor Bourne: There was an attempt, as you know, to present a cost-benefit analysis. We have commented on that at the moment simply by saying that we would expect a proper cost-benefit analysis. I think our wording is: “An informed cost-benefit analysis is necessary”. Certainly, from our perspective, there was not an informed cost-benefit analysis, and I think Defra would agree with that because the cost-benefit analysis excluded any of the more recent findings that we reported to Defra on September 29.

Q27 Chairman: Just to be clear, in your judgment a proper cost-benefit analysis should be produced for public view before a firm and final decision on this matter is made.

Professor Bourne: I think it is absolutely essential, yes.

Chairman: Fine. Thank you very much.

Q28 Patrick Hall: Just to put it in context—because one can listen to all this and get the impression that the final solution, which may be impractical, of the elimination of all badgers would deal with the problem of TB infection in cattle, but it would appear not—could somebody give me a broad indication of the main percentage sources of TB infection in cattle, badgers and other?

Dr Cheeseman: We do not know. You were looking at me, I am sorry.

Q29 Patrick Hall: Well, I am looking at anybody.

Dr Cheeseman: Okay. We certainly do not know what proportion of TB in cattle comes from badgers. The estimates range from 20 to 50%. The Irish put it at over 50%. But, if you remember, the objective originally of the Randomised Culling Trial was to quantify the role of the badger, but, because it was not possible in practice to eliminate badgers, that objective had to be abandoned, so we still do not know and I do not think we ever will.

Q30 Patrick Hall: So cattle to cattle?

Dr Cheeseman: Cattle to cattle is a big problem and I think all of us would agree that it is serious and it has to be addressed and it is probably bigger than the badger contribution. That is all I would say.

Q31 Patrick Hall: Professor Godfray?

Professor Godfray: I would just make the point that normally when one has a disease with a wildlife reservoir, the strategy is not to eradicate completely the wildlife reservoir but to reduce it to such a level that the disease is no longer sustainable in the wildlife reservoir. One of the particular difficulties of the epidemiology of bovine tuberculosis is that it is an extraordinarily difficult disease to study, particularly because of the problems with diagnostics, as Professor Bourne has already said, so we do not know the level one has to get the badger population down to, we do not know the

geographical level in which that happens. This is one of the things I referred to earlier—and it is through no-one's fault; this is just a particularly intractable decision—there are elements where it would be nice to have better scientific evidence to inform policy making where it is just absent at the moment.

Q32 Daniel Kawczynski: I would just ask a brief supplementary question of Professor Bourne before I go on to my main question. You said that this is not something the Government can deal with by itself, but the farming community has to be involved. I am very concerned for my Shropshire farmers. If they had trial badger culls, they were attacked by all these animal welfare rights people. What role are you, the scientists, going to play, through government, to ensure that people are well informed as to the necessity of a cull, thus protecting my farmers from intimidation?

Professor Bourne: I thought the whole endeavour was to inform government and the general populace and stakeholders of the science behind a cull—which is one of the reasons, of course, why we felt obliged to write to government, as we did in the last few weeks.

Q33 Chairman: You are going to suggest born to the barricades, then!

Professor Bourne: Could I answer this question by also answering the last question about the cattle contribution. You can state that the disease in relatively TB-free areas of the country is associated 100% with cattle transfer: there is no wildlife involvement there; it is cattle to cattle transfer. I would suspect that if you went back 20 years, you would see the development of TB in new areas, again as a result of cattle to cattle transfer. One then saw the badger element having an impact on this disease. It is very easy for us to suggest that farmers in Cumbria, Northumberland and Yorkshire should simply put up the barricades. I agree, it is far more difficult to advise farmers in hot-spot areas on what they should do when there clearly is a wildlife involvement and their view is: "If we kill the badger it must make it better." Science says, "If you do that, I am afraid it is not going to make it better; it could well make it worse. You really need to focus very aggressively on the cattle issues, cattle to cattle transfers, which you can do something about." It is then a question of will, whether farmers would wish to do that, particularly when they believe: "What is the point of doing that if badgers are going to re-infect my cattle?" There is no simple answer. I think the science underpinning these issues is becoming clearer and clearer. I accept, as Professor Godfray said earlier, there are still enormous gaps in our knowledge but the science base is nonetheless firm enough to advise not only government but also farmers and other stakeholders on a sensible way forward. Whether one kills badgers over a very large area or not, as I have stated, I believe is more of a political issue. Certainly there are serious logistics to be considered, but it is political rather than scientific.

Q34 Daniel Kawczynski: Various members of the panel have touched upon the size of the culling area that will be required. Are you in overall agreement as to the size that is required? Given the fact that you have suggested it is going to be a relatively large area, do we have the capacity to manage such a large culling area? Do we have the teams in place? How long will it take to set them up? That is what I am interested in, because I am led to believe that the teams that are set up for the Krebs' trials have been disbanded and we will have to start from scratch.

Professor Bourne: The trial data does indicate that if one culls, as we did in the trial, over 100 km², over that area one would have a zero impact on cattle TB. Professor Donnelly has modelled what an extension of the trial areas would deliver and it does suggest that at 300 km² you get a positive impact—a balance between the positive impact on the inside and the negative on the outside, but overall a positive impact—with very wide confidence intervals, but around, say, 20% impact. Extending beyond that, the model suggests, provides no great advantages on increasing the percentage impact on cattle breakdowns, but of course it does mean you are covering a much larger area of the country. You have to recognise that TB hot spots do affect a very large area of the country. Even though 300 km² is a large area, you would need a number of those to cover all hot-spot areas.

Professor Donnelly: To clarify, that was really an extrapolation based on the area of circles and their relative perimeter areas within two kilometres. One of the issues with this sort of extrapolation is that the 20% reduction inside and the 29–30% increase outside are relative terms. Ideally, you would like to have a big culling area that covers all your high-risk areas, so you get the 20% reduction in there, and, then, if you have to stomach a 30% increase on the outside, at least it would make that a 30% increase of a relatively low incidence.

Q35 Chairman: When you talk about "even a large area" and you said there is a 20% reduction, if you achieve a 20% reduction, does that mean all the other measures (bio-security, cattle movement, pre-movement testing) would then have an opportunity of cracking the spread of the disease?

Professor Donnelly: We are starting to get into some very complex areas. From a disease dynamics point of view, all we want to do is reduce it so that we are getting to: "For every case we have now, we get less than one new case coming up" and then we will be in a declining situation. It is extremely difficult to extrapolate from the basis of an experiment like this, where you have matched pairs, to what happens dynamically.

Q36 Chairman: I come back to this consultation document. I am interested in the questions that should be posed. It does strike me that the document, maybe in the questions it has put down, has not in fact exposed the debate of uncertainty, even within the careful work that you are now describing to us, because you are talking about what

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I was asking about earlier; namely the trade-off between the decline in incidents achieved by culling and the ability to break the cycle of the further incidents of bovine TB. To come back to the questions that are being asked, do you think the questions are there to tease out the analysis that you are putting before the Committee?

Professor Donnelly: I do not think they address this dynamical feed-back nature of the infectious disease.

Q37 Chairman: Should they do that?

Professor Donnelly: Ideally, yes, but if they are so difficult I am not sure they would be able to get to the issue in simple questions.

Q38 Chairman: It may be very difficult, but that is exactly what the Minister has put out for consultation: a difficult issue. And I am interested in making certain the right questions are being asked so that when ministers come to make their political decision informed by science they have the best information available to them. The message I am getting from you is that there may be a question mark as to whether they are getting the full rich analysis that you are giving us.

Professor Donnelly: This includes the other companion issues as well that we talked about of other methods of control. You asked would this be sufficient; one of the things that we have shown with the modelling paper that we recently published in *Proceedings in the National Academy of Science* is that simply by leaving badgers alone completely so that their contribution stays static, simply by increasing the sensitivity of TB testing, which could be either by improving the way the test is used or using another test, and/or increasing testing frequency, it could be sufficient to bring this reproduction number below one and therefore turn an increasing trend into a decreasing trend. That modelling shows that with leaving the badgers alone, just focusing on the cattle controls, would be sufficient to turn that trend around. That does not guarantee that you go straight to eradication, but it certainly in the short term turns your increasing problem into a decreasing problem.

Q39 Chairman: If I have understood you correctly, unless you get 100% removal, which is conjecturable, whichever route you go down you cannot guarantee what the steepness of the slope to eradication is.

Professor Donnelly: That is true, it is always extremely difficult in this modelling to predict when the end will come, even if you have a fast-moving disease like foot and mouth; it was very difficult to say when would the last case be.

Q40 Chairman: Thank you. Professor Godfray?

Professor Godfray: At one level of abstraction I think what one can say at the moment—and this is only partially helpful—is that there are certain things that you can do that will do no harm and will probably do good. Working on the cattle to cattle

transmission, working on better diagnostics and working on farm biosecurity will all clearly help and may make substantial progress to getting below the threshold that Professor Donnelly has just mentioned. Where the badger culling is different is we do not now think that increasing badger culling, reducing the population of badger, will necessarily do good; it probably will ultimately if you get to eradication, but at least in the short term it may be counter-productive and move you away from this eradication threshold that you are trying to get at.

Q41 Lynne Jones: Defra says that it bases its policies on sound scientific advice, yet it is clear from your comments on the consultation document that it is badly framed and ignores scientific evidence. To what do you attribute this difference between what you as scientific advisers that they have appointed are telling them and what they actually are disseminating in these documents? Why have they not listened to you?

Professor Bourne: It has been puzzling to us for some time because, consistently, the Secretary of State has commented that a TB control policy must be based on sound science, yet over the past 18 months Mr Bradshaw and also the Chief Veterinary Officer have stated on a number of occasions that they are able to and would develop future policies without waiting for the end of the randomised badger culling trial. We found that very difficult to understand.

Q42 Lynne Jones: Do you think there are any political pressures?

Professor Bourne: I am sure there are political pressures.

Q43 Lynne Jones: What you are saying is they have put forward options that will make things worse, not better; what on earth would any Government department be doing in suggesting such a policy if it is based on sound science, or is supposed to be?

Professor Bourne: I do not know. There have certainly been very serious political pressures, pressures from the NFU on the one hand with respect to badger culling and, I am bound to say, pressures from the Select Committee as well. If you read the reports of previous Select Committees there has been pressure on Government with respect to badger culling and I believe there has been all party support for badger culling, so I sympathise somewhat with the Minister and the position he has found himself in, but I just cannot answer your question, it is a question you need to address to Defra.

Q44 Lynne Jones: As a new member to this Committee I can ask such questions. It is clear to me that what you are saying is that the most important way we need to go forward is to improve diagnostics. Are there any other things we could do, for example in reducing contact between badgers and cattle?

Dr Cheeseman: We have not really touched on husbandry at all but biosecurity has been mentioned. There is potential for improvement in

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farm management in order to reduce the risks from wildlife, and although you will probably hear the NFU later today say that these things are impractical, I could show you some very interesting videos of badgers visiting buildings where the farmers were completely unaware that they were being visited by badgers. There is a need for educating the farming community better and there is certainly a need for research that is focused on identifying and quantifying the risks. I am not saying it is as simple as shutting a door, but really we have to reach out to the farming community and say, look, you do have a responsibility to try and tackle this disease yourself. Although I know colleagues in the NFU have said they find these things impractical and expensive, there are some simple measures that they could take which would reduce risks.

Professor Godfray: It is not my brief to defend Defra, but I do have huge sympathy for the difficulties that they have and I think it is very important to realise that there is never going to be any one time where we have the perfect scientific information by which we can develop policy. All the way along it is going to be a trade-off between the quality of the information that you have at any one time—much better now thanks to John Bourne and his group—and the amount of money it is costing the country. Every single time it is going to be for Defra to make decisions based on imperfect knowledge. If I could just briefly support what Dr Cheeseman has said, as someone coming much more as an outsider into this field, the absolute importance of biosecurity on farms and incentivising farmers such that they take this very seriously will do a huge amount to help with this problem.

Q45 Mr Drew: I am going to ask you a scientific question, but you may see it as a political question, and it is not in any way trying to catch you out but you talked about cost-effectiveness, practicability and sustainability; I want to look at the middle of those, practicability. At what level of non-compliance would you as a scientist begin to think that any level of badger culling becomes counter-productive? You have talked about localised culling being something that you have got evidence now that it could lead to increased bovine TB. If you have these huge areas and you have significant non-compliance, non-agreement by either farmers or wildlife trusts or A N Other who are landowners in those areas, at what level would you as a scientist feel very unhappy with pursuing a culling strategy?

Professor Donnelly: One of the immediate things is that one of the additional analyses that we did in the analysis of the randomised badger culling trial was looking to see if the impact of proactive culling differed in areas based on the consent level that was achieved. Over the consent levels that we observed we did not find a significant interaction, so we found no evidence of a systematic variation on the basis of the consent level that was achieved. There are two things to consider with that: one is that obviously the trial was not designed to be powered up to find the interaction, so there could be an interaction and we

just have not detected it; the other thing is I think it is probably very likely that the impact of non-compliance would not just be a simple function of what proportion of the land was non-compliant but how it was distributed, so if there is a big patch of non-compliant land that is probably very different than if there were lots of little patches, but I certainly do not think that from the trial itself we could say what the threshold was.

Professor Bourne: No, that is right, we could only comment on what we found in trial areas and, taking the trial overall, we had something like 89% co-operation from farmers, 11% did not wish to co-operate at all. Of the 89% 71%, or something like that, opted for survey and cull and of the other 18% the majority agreed to survey only and no cull, in other words they had nothing to hide by us going onto their farms—one suspected they just did not want their badgers culled. If one looks forward to an application of this as a policy, it is very likely that those percentage figures will not change very much or, if they do, I would suspect there would be less farmer co-operation because if farmers do not have TB—and the majority of farmers do not—there would be concerns if badgers were taken out that it would disturb their badgers which they regard as disease-free and lead to them having TB breakdowns. Inevitably, therefore, if one pursues a policy of culling there is going to be quite an element of non-co-operation, similar to or perhaps a little bit greater than we experienced in the trial, but you must accept that although we had this non-co-operation in the trial, we were still able to reduce the incidence of the disease in cattle by 20% with the culling methods that we operated.

Q46 Mrs Moon: There is an issue over the method of culling, and I know that there are suggestions of, I believe, four alternatives. What is the scientific consensus on the most appropriate and most effective method of culling and where does that lie in terms of complying with circumvention of European standards in terms of animal welfare?

Dr Cheeseman: There are five methods—there is trapping, snaring, gassing, poisoning and shooting. If we take shooting first, shooting is generally regarded as the method where you use a high-powered lamp at night and shoot badgers in the open. The restrictions on that are obvious: you have to have badgers in the open and you cannot shoot them in the woodland. It is also quite dangerous and I am sure you will be aware of some of the tragic fatal accidents that have occurred recently. The other type of shooting would be shooting on setts and shooting on setts suggests that the first shot would be the last on most nights because they would just retreat below ground and not come out again, so I think shooting would be rather inefficient. Taking poisoning—incidentally, chairman, I have actually over the course of my career legitimately used all of these methods so I do speak from some experience—we have poisoned badgers inadvertently when we were targeting foxes in a rabies control trial. They are very easy animals to target with poison, as was

evidenced by the fact that we poisoned a lot of badgers when we were targeting foxes. The risks of poisoning are that you have no control over non-target species taking the poison, and there is also a safety issue to the operators. Gassing—we abandoned hydrogen cyanide gassing in 1982 when it was found to be inhumane in action, and there was also a problem of reaching the farthest extremes of a badger's sett and achieving lethal concentrations of gas, so badgers were surviving in the blind ends and loops in the complex structure of a badger's sett. There is also the issue of the porosity of soils that badgers commonly dig their setts in, you also have an issue of safety and, again, a risk to non-targets. With snaring, snares carry a very significant risk in terms of the welfare of any captured animal: the longer an animal is in a snare, the more likely it is to sustain injury. When we operated snares the frequency of the inspections were not more than three hours, but I do not think that is a very practical option for a control method. There is also a significant risk to non-target species: no matter how hard you try you will end up sooner or later probably catching somebody's dog or a deer or even a steer, as was the case in my experience. There is a need for a closed season to avoid catching and removing lactating females and leaving the cubs to starve. With trapping, you are probably aware that some badgers are trap-shy and at best you are going to catch 80 or 90% of badgers. The efficacy varies hugely with the weather and the season. Traps are bulky, they are easily targeted by animal rights activists and, again, you have to have a closed season. None of these methods is perfect, therefore, and all of them require a very high degree of skill in their operation.

Q47 Mrs Moon: Can I be clear, my understanding is that poisoning is not an option that the Government is considering.

Dr Cheeseman: It was not put in the consultation document.

Q48 Mrs Moon: You say that all of these need a high level of skill; given the potential volume that we are talking about here, do we have those large numbers of people with these specific skills?

Dr Cheeseman: Defra's wildlife unit had an enormous body of expertise in trapping and the associated skills of surveying—you have to find the setts first—but that is where it really ends. A few of those people did have some experience of snaring that goes back at least a decade, but there are not very many of them left so the answer to your question is really no.

Q49 Mrs Moon: Thank you. What about the culling approach contravening the Bern Convention and the European Convention on Wildlife and Natural Habitats, what are we talking about here?

Dr Cheeseman: We have been taken to task under the Bern Convention before. I had to go to Strasbourg and argue the case and it rested upon the issue of local extinction. If any strategy achieved the

extermination of a species, even locally, it was a concern, and we managed to persuade the secretariat that this was not going to be achieved in the randomised culling trial. I think if it was the objective of any policy we would have to explain to the secretariat why we were seeking to achieve that because there is provision in the Convention for action to be taken where there is a serious problem and obviously disease is a serious problem. I dare say we would be back before the Bern Convention if a culling policy were introduced that would achieve the local extinction of badger populations.

Q50 Mrs Moon: From what has been said earlier it is 100% that is the target, albeit the fact that you will acknowledge that there is no chance that you would achieve that, so it is failure rather than a lack of policy. The policy would be 100%, but your actual success rate could never be achieved at 100%.

Dr Cheeseman: I agree it is an issue and it would be something that would have to be resolved.

Professor Godfray: The policy would not be 100%, it would be to reduce badgers below a level at which bovine TB was not sustainable in that or in other wildlife reservoirs. It could be very low and it could risk extinction, but the policy would not actually be 100%.

Dr Woodroffe: I would just like to come back on Professor Godfray's point. I absolutely acknowledge that the aim would be to reduce badger densities to such a level that TB completely disappeared from the badger population, and I would just like to comment that however low we have managed to get badger populations, we have never seen the infection disappear and, indeed, there has not been any relationship found between the population density of badgers and the prevalence of infection with TB.

Chairman: Fine. A quick question for David Drew.

Q51 Mr Drew: I am intrigued, John Bourne, to what extent Defra—either through the Minister directly or through his officials—sought your advice on culling strategies? If they have not sought your advice, on what basis are they able to carry through these strategies because they have not been used on a large scale—you could argue ever—certainly for some considerable time?

Professor Bourne: Neither I nor any other member of the ISG have had regular meetings with the minister, in fact they have been very infrequent, but of course the Minister does have senior civil servant colleagues attending all of our ISG meetings which we hold on a monthly basis, so contact and I assume feedback through that mechanism would be fairly complete. With respect to the consultation paper—we were not asked to comment on the consultation paper, but we were involved in some of the discussions that were organised on a national basis with stakeholders some 12 months ago on developing the consultation document, but our input was no different to the input of other stakeholders. We only had the opportunity, as I said earlier, of commenting on the scientific component

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of the paper, the three or four pages or whatever it was, a few days before the publication of the consultation paper. I first saw a draft of the consultation document on the evening of December 14—it was published, if you recall, on December 15—and my colleagues did not see it until it was on the website, so we played no part in drawing up that paper and, as I have indicated, we were concerned about the scientific interpretation. I immediately informed Defra—and I do mean immediately—that we would need to write to ministers and I also informed Defra that that would be in the form of an open letter.

Chairman: Thank you very much indeed. That, as always, has been fascinating, challenging, interesting and you have given us in a relatively short space of time a great deal of food for thought, and I am sure better informed our thinking about the nature of the questions which Defra have posed as far as this consultation exercise is concerned, so can I not only thank you for coming once again and giving of your expertise and your time, but also for your written evidence and the copies of various presentations which I did my best to understand. I got the general message, but this pupil could do better. Thank you very much indeed for coming.

Memorandum submitted by the National Farmers' Union (NFU) (BTB 20)

BOVINE TB: BADGER CULLING

1. INTRODUCTION

The National Farmers' Union of England and Wales (NFU) represents the interests of some 55,000 members involved in commercial agriculture, horticulture and farmer controlled businesses. We are grateful for the opportunity to submit evidence to this inquiry into bovine tuberculosis (bTB) on behalf of our membership.

2. We understand this inquiry will consider “the key questions that Ministers must address in reaching conclusions on the issues set out in the [Controlling the Spread of Bovine Tuberculosis in Cattle in High Incidence Areas in England: Badger Culling] consultation paper” which was launched on the 15 December 2005. Clearly this consultation and its implications are of great importance to our members; however we feel there are a number of other, broader issues which need to be raised in advance of our detailed comments on the consultation document itself.

3. Of primary concern is the issue of timing of the implementation of Defra's new policies. Pre-movement testing and tabular valuations are to be introduced within the next few weeks. These will result in an increased financial and bureaucratic burden being placed on farmers; an inequitable method of valuation and an unfair reduction in compensation payments being paid to farmers.

4. These increased cattle controls will be imposed on livestock producers in the absence of effective wildlife controls, at least in the short term. Farmers will face increased costs and difficulties as outlined above, whilst at the same time they will remain unable to do anything to address the bTB reservoir in badgers.

5. Throughout our negotiations with Defra over a number of years, the combined policies of pre-movement testing, tabular valuations and badger control have always been seen by the NFU to go hand in hand. Despite our objections to aspects of this trio—in particular tabular valuations—we have always seen the measures as a package, and understood that this is how they would be implemented. We believed that while pre-movement testing has the potential to reduce the spread of TB to clean areas, in the absence of badger control its impact within 12 and 24 month testing areas would be negligible.

6. Following consideration and discussion of Defra's announcement made on 15 December 2005, the NFU has adopted a more robust stance. This is based on our continued objection to the introduction of tabular valuations; a lack of firm government commitment towards addressing the bovine TB reservoir in wildlife; and the introduction of pre-movement testing. It is our belief that as these policies stand there will be no reduction in TB incidence, but there will be an increase in hardship for farmers.

7. The NFU recently wrote to the Secretary of State to highlighting our concerns and calling for a delay in the introduction of pre-movement testing. The letter, to which a response has so far not been received, made the following points:

7.1. The two disease control measures proposed in the Defra's recent announcement are pre-movement testing of cattle and the control of the wildlife reservoir of bTB. Suitable disease control must tackle bTB in all affected species. The NFU is concerned that pre-movement testing will be imposed on the industry in advance of badger control. Our primary objection to this is the imposition of extra costs and bureaucracy on farmers in return for negligible benefits, as the disease will still be present in badger populations.

7.2. The NFU has urged the Secretary of State to reconsider her decision and delay the implementation of pre-movement testing until the consultation on badger control is over and a policy of effective culling can begin.

8. We highlighted the likelihood of a lack of co-operation amongst our members as a result of these new policies:

8.1. “I cannot overemphasise the strength of feeling in the beef and dairy sectors. Indeed at the NFU Council meeting yesterday, the view was unanimous, in a very heated debate, that in a partnership approach, all parts of the strategy must start together. This is true not only in the worst-hit areas, but also in all other areas which feel threatened by the continual spread of this disease. As the situation currently stands, producers see December’s announcement as imposing an extra burden on their businesses, accompanied by nothing more than a further delay in tackling the major disease reservoir. Indications are already appearing that this view is leading to a decline in co-operation between farmers and Defra and its associated agencies. The NFU does of course not condone this, but we may have difficulty in preventing such activity.”

9. TABULAR VALUATIONS

The NFU continues to object to the introduction of tabular valuations, particularly for high genetic value stock, and the absence of an appeals mechanism. This new system could be grossly unfair to many farmers, and is exacerbated by the fact that farmers are unable to address the main cause of bTB and thus effectively reduce the chance of their herds being infected with bTB and animals being slaughtered.

10. The figures recently released by Defra applying to animals taken in February 2006 seem to show a complete disregard for the intrinsic value of the UK breeding herd. The NFU highlighted to Defra the problem that only a very small percentage of the breeding and productive herd is actually traded. Therefore the largest part of the UK herd is not considered when market data is collected. We believe the values in the table have substantially undervalued a significant part of the UK herd.

11. PRE-MOVEMENT TESTING

The forthcoming imposition of pre-movement testing, in the absence of the promised and appropriate public consultation, could present serious problems to beef and dairy farmers. We have serious concerns over the impact that this will have on our members ability to trade; this is at odds with Defra’s assertion, in their document “TB in Cattle—Reducing the Risk: Pre- and Post- movement testing in Great Britain,” that “the new controls will have no direct impact on market procedures.” As already explained we see pre-movement testing as nothing more than an increased regulatory cost burden imposed on beef and dairy farmers, which will have no real impact in the absence of effective badger control.

12. The policy of pre-movement testing is experimental and the NFU have always said that, as such, Defra should pay the costs rather than imposing further financial burdens on farms already unfairly under great economic stress from bTB, when the policy may not even work.

13. We also have very real concerns that pre-movement testing will reduce the through-put of cattle in markets and auctions, thus reducing the available market data used to establish cattle valuations under the forthcoming tabular valuations scheme. This could further increase the likelihood of erroneous and inaccurate valuations being made with regard to the value of reactor cattle. As it stands the system is already inherently unfair and will lead to gross inequality amongst compensation received by livestock producers.

14. The combined effect of the above two policies will greatly and unfairly endanger the economic survival of many cattle farms in bTB “hotspot” areas.

15. BADGER CULLING—PRINCIPLES

The requirement for badger control is both undeniable and unavoidable. Only by tackling the disease in all main reservoirs (cattle *and* badgers) will effective control of bTB be achieved. A number of culling trials carried out in the UK and Republic of Ireland over the past three decades has demonstrated that culling, if carried out effectively, can reduce TB breakdowns in cattle herds. Without culling, the combined weight of increased cattle controls and an uncontrolled wildlife reservoir of bTB could destroy the very industries which Government policies are trying to protect.

16. INDEPENDENT SCIENTIFIC GROUP

The Independent Scientific Group (ISG) has been at the forefront of research into badger culling in recent years. While the results of the Randomised Badger Culling Trials have contributed to the debate and provided further evidence of the benefits of badger control, we are concerned that the one method used in the trials, cage trapping over a maximum period of 12 days at any one time, is both ineffective and inefficient. The NFU hopes that further evidence will be considered by the Government alongside the RBCT results.

17. “EDGE EFFECT”

One of the main problems associated with the RBCT’s “proactive” cull was perturbation, or the “edge effect.” This method of control will have a significant impact on behaviour of these very territorial animals, and unless the majority, if not all, of the family or social group is despatched at the same time, then behaviour is likely to be disturbed and increased ranging may occur, thus increasing disease spread. We feel that the use of gas (see below) is the best option to minimise such behavioural changes and hence avoid perturbation.

18. CO-OPERATION AND PARTNERSHIP

Effective control of badgers to curb bTB in cattle is not just the responsibility of farmers and landowners, and Defra must understand this. Disease control is the responsibility of all stakeholders and the Animal Health and Welfare Strategy emphasises this. Therefore we would reject any suggestion that badger control, following the consultation, should be left to the industry alone to undertake. Defra must be involved to assist with planning, organisation and administration of culling; they must also be seen to be involved publicly to reduce the negative publicity which such a move may incur. Furthermore, Defra must remain fully involved because only by working in partnership and fully co-operating with the industry—and the industry co-operating with Defra—will the problems caused by this economically crippling disease be addressed.

19. Defra and SVS have access to specific GIS and farm breakdown data which would be required for an effective cull, and this is another area where effective partnerships must be encouraged to develop between Government and the industry.

20. In our response to the consultation, we will therefore make it clear that we would consider it grossly unfair to offer no other alternatives than for farmers to undertake culling themselves. We will also push for as many culling methods as possible to be made available for use to allow for flexibility to suit local conditions.

21. CULLING METHODS

22. *Gassing*

Gassing with CO/CO₂ from exhaust gas is a method which the NFU wishes to see considered as a means of badger control. This method of control is believed to be less stressful to the wildlife involved than others currently being investigated. Using gas would enable the occupants of whole setts to be culled in one operation, thus minimising the perturbation which has been linked to the RBCT proactive trials. The training needs for this method of control are also lower, resulting in a speedier skills delivery. With this in mind, however, we have made clear to Defra our strong objection to the loss of the personnel involved in the RBCT. We see these people as a valuable and knowledgeable resource and consider it short-sighted to end their contracts in advance of any badger cull.

23. *Organisation*

Our suggested method for badger culling is the use of gas (exhaust) within areas defined and contained by physical boundaries (such as rivers and motorways). Licences would be issued under the 1992 Protection of Badgers Act for the area as a whole, not for individual farmers and landowners, or their representatives. This would reduce the organisational difficulties of issuing licences to large numbers of operatives and alleviate the worries of many of our members about having their personal details recorded in a database.

24. Defra officials, alongside farmers and landowners, would carry out control operations on previously identified setts within the area. Follow-up operations would be carried out in the following weeks and months, and setts would be rendered uninhabitable.

25. No agreed control method would be ruled out. The use of stop-snares and shooting, which are both less attractive in terms of efficiency and time required to operate successfully, must still be available for circumstances where gassing is inappropriate or difficult.

26. It is the opinion of the NFU that such methods would achieve the greatest landowner co-operation. The NFU is currently involved in surveying members in affected areas of the South West and West Midlands to ascertain likely farmer co-operation with culling, depending on the control method chosen. It is our belief that this would be greater under the circumstances described above than with any other method.

27. *Research into use of Gas*

We are disappointed that Defra is only now evaluating the use of gas as a possible culling method. bTB has been on the increase for a number of years now, and we consider that such work should have begun when this first became clear. This lack of foresight may result in a delay in policy implementation when this decision is made.

28. The Krebs report (Bovine Tuberculosis in Cattle and Badgers, 1997) reports that gassing, used between 1975 and 1981, had the following effects:

28.1. "Cattle breakdown rate fell. Recurrence of breakdowns on controlled farms fell. In large areas of effective removal, such as Thornbury, breakdowns were fewer for ten years after removal."

29. Disappointingly, the ISG appears uninterested in the use of gassing as an effective control method for bTB, on the basis that results took seven years to achieve. However, control operations did not seem to have been carried out with any degree of urgency. The Krebs report describes the durations of operations as thus:

29.1. "Removal period relatively short (about 1 week), but post removal operations were long (usually 12 but up to 24 months following initial gassing)."

30. The NFU would argue that with organisation and commitment this timescale could be radically improved. Effective and continued clearance could be achieved more quickly.

31. *Shooting and snaring*

In the absence of gassing as a method of badger control, it would be more difficult to convince farmers to involve themselves in shooting and snaring. The skills, training, time, and expense required are significantly greater. We also believe that these methods of culling will lead to piecemeal badger control in small areas, causing maximum disturbance to badger social groups.

32. We know from ecological studies undertaken by the ISG that social disruption of badger groups can lead to increased territorial ranging and an increase in bTB spread through perturbation. Consequently, there is a danger that snaring and shooting, when used as the primary or only culling methods, could increase the incidence of bTB in cattle herds, at least in the short term.

33. When employed on their own we see these methods as being too slow and cumbersome to be effective in the high badger populations which can be found across the TB hotspot areas.

34. CONCLUSION

NFU policy has always called for healthy cattle and healthy badger populations. While incidence of disease continues to escalate and spread, we are in real danger of infecting more and more cattle and badger populations, and over a larger area. We firmly believe that it makes sense to curtail this spread before it becomes irretrievable.

February 2006

Memorandum submitted by the Badger Trust (BTB 27)

CONTROLLING BOVINE TUBERCULOSIS

A. INTRODUCTION

1. The Badger Trust welcomes this inquiry by the Environment, Food and Rural Affairs Select Committee. The Government's proposals to cull badgers in order to control bovine tuberculosis (bTB) in cattle are extremely alarming. We believe that the proposals are not based on sound science, would lead to the extermination of tens of thousands of perfectly healthy badgers and will worsen the bTB problem in cattle.

2. In addition, we contend that the undue haste with which the proposals have been rushed out betrays a deeper malaise in the Department for Environment, Food and Rural Affairs (Defra). We argue that, when it comes to making decisions about disease control, Defra retains many of the flaws that plagued its immediate predecessor, the Ministry of Agriculture, Fisheries and Food (MAFF).

3. The Badger Trust welcomes your decision to: "focus on the key questions that Ministers must address in reaching conclusions on the issues set out in the consultation paper".

4. The Badger Trust notes the submission to the EFRA Committee from Wildlife and Countryside Link. That submission, to which we are signatory, details a range of questions currently in urgent need of answers. The Badger Trust also notes the detailed submission to the Committee from the Mammal Society. That learned body has dissected the Government's consultation document, identifying a wide range of flawed assumptions and further unanswered questions.

5. In making this submission to the EFRA Select Committee, the Badger Trust asks whether the Government's proposals conform to the recommendations of the *Lessons to be Learned Inquiry*⁶ into the foot and mouth disease (FMD) outbreak of 2001. Whilst bTB does not spread with the speed of FMD, many valid comparisons can be drawn in assessing the Government's management of the two diseases. We contend that Defra has failed to learn many important lessons from FMD.

⁶ Anderson, I (2002) Foot and Mouth Disease 2001: Lessons to be Learned Inquiry.

6. We draw the Committee's attention to:

- (i) A lack of creative initiative;
- (ii) A failure to develop comprehensive contingency plans;
- (iii) A failure to communicate in a transparent and open way;
- (iv) A failure to apply risk assessment and cost benefit analysis;
- (v) A failure to use data in support of intelligence gathering and decision making;
- (vi) A failure to base policy decisions on the best available science and to use clearly understood and trusted processes for making use of scientific advice.

7. As a result, Government produced a national strategy for bTB too slowly. It has been even slower in implementing it because, we contend, officials are reluctant—contrary to the *Lessons to be Learned Inquiry's* advice—to reduce livestock vulnerability by reforming industry practice and to minimise the impact of bTB.

8. Badgers have effectively been scapegoated for industry inertia and used as a stick with which to beat the Government. The scientific data gathered by the Randomised Badger Culling Trial (RBCT) and its associated research should have provided Government with an effective, evidence-based shield against such attacks. Instead, it appears that officials within Defra, whose professional reputations have been built on the advocacy of culling, have hampered or suppressed key research, leaving Ministers with no alternative strategies to fall back on.

B. A LACK OF CREATIVE INITIATIVE

9. *“Within MAFF, and now DEFRA, I detected a culture predisposed to decision taking by committee with an associated fear of personal risk taking. Such a climate does not encourage creative initiative. It inhibits adaptive behaviour, and organisational learning which, over time, lowers the quality of decisions taken. It seems to me that a reappraisal of prevailing attitudes and behaviours within the Department would be beneficial.”*⁷

10. The Badger Trust observes that, following the discovery of a badger with bTB in 1971, the overwhelming focus of Government attention has been on badgers. Defra has failed to show creative initiative in dealing with bTB in alternative, more constructive ways.

11. The lack of creative initiative is evident in the history of bTB inquiries. Each inquiry by Lord Zuckerman, George Dunnett and latterly Professor Krebs⁸, stuck closely to the narrow terms of reference set by Government officials. In each case, the authors were asked to look only at the role of badgers in bovine tuberculosis.

12. In the case of the Krebs report, which led to the RBCT, no consideration was given to the potential role of cattle to cattle transmission. We regard this as an extraordinary and lamentable omission, not least because Professor Krebs was the author of a Royal Society report on science's role in risk assessment.

13. Had it not been for the genuine independence of the Independent Scientific Group (ISG), which followed Krebs, it is doubtful that this trend would ever have been bucked. The ISG, by looking at bTB holistically, has compelled Defra to re-examine the role played by cattle in the spread of bTB.

14. In addition, a variety of evidence suggests that Defra officials continue to demonstrate a fear of personal risk taking by, for example, failing to draw attention to emerging bTB issues that needed addressing. This is best evidenced by Defra's approach to the problem bTB in deer. It was only following our report on bTB in deer⁹ that the possibility of deer involvement in bTB transmission became part of the public debate. Yet Defra had clearly known about the problem for a very long time and suppressed it:

- (a) The TB Forum was established to consider methods for controlling bTB *other than badgers*. Defra officials refused to allow the Badger Trust to table its research paper on bTB in deer to the TB Forum. Officials refused to allow discussion of the role played by deer in transmitting bTB to cattle. Indeed, although Defra was working with the British Deer Society on ways of addressing endemic bTB in at least four populations of wild deer, members of the TB Forum were never told of this work. It emerged in a chance remark in a radio interview prompted by the Badger Trust's own report into bTB in deer. Defra invited the Badger Trust to attend a discussion about bTB in deer. This, of course, would have kept the matter offline. We insisted on a written response to be published online for the benefit of all stakeholders.
- (b) When a new bTB outbreak occurred on the Furness peninsula in Cumbria, Defra announced a study of badger road traffic accident victims to determine whether they were the cause of the outbreak. Deer were also to be included in the study, but only badgers were mentioned in the press release headline.¹⁰ It required investigations by the Badger Trust to reveal that a herd of bTB infected red deer were involved in the outbreak. The red deer had been sold on to Penwith,

⁷ Anderson, I. (2002) *op. cit.*

⁸ Krebs, J (1997) *Bovine Tuberculosis in Cattle and Badgers*, MAFF, London.

⁹ Badger Trust (2004), *Bovine TB in deer*, London.

¹⁰ DEFRA (31 December 2003) News release /NW/125/03, *Survey of badgers on the Furness peninsula of south west Cumbria following rise in bovine TB cases*, London.

triggering further bTB outbreaks amongst local cattle herds that, in turn, led officials back to the source farm on the peninsula. By September 2004, Defra had tested 19 badgers for bTB and found no evidence of the disease. Yet it had failed to assess bTB in wild deer in the area. Although deer shooting is a widespread practise, only one deer had been submitted for investigation.¹¹ To this day, Defra has failed to advise the media that badgers were not involved in the disease and that the outbreak is the result of localised deer management and farming practices (such as nose to nose contact with stock moved widely across small grazing lots). Although park fallow deer remained on the source farm and were a potential source of infection, Defra advised us that it had no legal authority to deal with the deer.

- (c) Research by the Central Science Laboratory into the presence of bTB in wildlife other than badgers was never publicised by Defra, even though it had found evidence of the disease in a very wide range of animals and had identified a particular problem in fallow deer.¹² Maps used in the study show that the fallow deer carcasses, with an infection rate of up to 16%, came from a relatively small area of Gloucestershire. Yet the Badger Trust is not aware of any action being taken to address the infection in those deer. Moreover, although this is a bTB hotspot, there have been no press releases about the existence of bTB in deer in this or other areas.

15. Similarly, the Badger Trust has observed a lack of creative initiative in Defra with regard to investigating ways of minimising badger to cattle transmission of bTB. Almost all resources have historically been focused on killing badgers. We further explore the problems that this has created in (4).

C. A FAILURE TO DEVELOP COMPREHENSIVE CONTINGENCY PLANS

16. *“Contingency planning should not be seen in isolation. It is a dynamic process, not a static document. It must be linked into a wider process of risk analysis and disease prevention. Risks should be managed so that the country can better respond to threats at an early stage. This can help to ensure that future animal disease emergencies are less likely to become crises, and that crises do not become disasters.”*¹³

17. Over the last ten years, Government has presided over the steady spread of bTB to new areas. It has watched the establishment of new bTB hotspots and done nothing. It is abundantly clear that badgers were not the cause of this spread. The Badger Trust (then, the National Federation of Badger Groups) warned on 5 December 2001 that allowing the movement of untested cattle in the wake of FMD would allow TB to spread¹⁴. We were ignored.

18. It is now clear that the ISG was also ignored. The ISG has confirmed in its Fourth Report that:

*“Geographic spread was heightened by the predictable increase in cattle movements, and its associated disease risk, that followed the lifting of restrictions imposed during the FMD epidemic. Our concern at the increased potential for the spread of TB that this represented, particularly into relatively unaffected areas of the country, as a result of inadequate biosecurity (movement of infected cattle), was forcibly expressed at the time to Government representatives and the farming community. Sadly, these warnings went unheeded and we are now seeing the consequences of this lack of caution.”*¹⁵

19. It is also clear that Defra has possessed sound scientific evidence that cattle movements are the cause of new bTB outbreaks since 2003. Long before the results were published in *Nature*, Defra’s own copy of research report SE 3034 was online, stating clearly that:

*“These analyses have demonstrated unequivocally that the movement of animals, especially those from cells where BTB is present, and particularly for locations outside the core disease areas, is a critical factor in the current exponential increase in BTB.”*¹⁶

20. The agonisingly slow response of both MAFF and Defra to the steady spread of bTB contrasts strongly with Defra’s rush to cull badgers in the wake of the publication of the RBCT’s research. As far back as 1998, members of the TB Forum had approved a tightening of bTB testing regimes to make Britain compliant with EU regulations. But the changes were not implemented for more than four years.

21. In 2001, the ISG recommended that the whole of Britain underwent annual bTB testing. In 2002, the British Cattle Veterinary Service (BCVS) supported this and recommended pre-movement testing, too¹⁷. Yet Defra did not establish a pre-movement testing stakeholder group until September 2004. It did not report until June 2005 and its recommendations only came into effect on 1 February 2006.

¹¹ Moffitt, J (October 2004), TB in South West Cumbria 2002–04, TB Forum Paper TBF 109, London.

¹² Central Science Laboratory (2004), The risk to cattle from wildlife species other than badgers in areas of high herd breakdown risk, York.

¹³ Anderson, I. (2002), *op. cit.*

¹⁴ NFBG (5 December 2001), Farmers at risk from disease triple whammy, London.

¹⁵ ISG (2004), An Epidemiological Investigation Into Bovine Tuberculosis, Fourth Report of the ISG.

¹⁶ Environmental Research Group Oxford Ltd (2003), Investigation of cattle movement records in Britain, Defra research project SE 3034, London.

¹⁷ Sibley, R (17 November 2002), Countryfile, BBC1, Birmingham.

22. Thus, despite the abundant evidence of the risks posed by the movement of infected livestock, it has effectively taken Government more than seven years even to begin to address the problem.

23. Alarming, there is no evidence that Defra has given any consideration as to how pre-movement testing will be monitored and enforced. Our informal discussions with Defra suggest that there is no legal obligation on markets to ensure that cattle must comply with the pre-movement testing requirement before being sold. There appears to be no provision for robust, scientific modelling of the benefits of pre-movement testing either.

D. A FAILURE TO COMMUNICATE IN AN OPEN AND TRANSPARENT WAY

24. The Government's consultation on badger culling should be comprehensive in its analysis and presentation of the facts. Yet we note that critical information is missing, with the result that the consultation is not open and far from transparent.

25. The consultation conspicuously lacks:

- (a) Estimates of the number of badgers that would be killed;
- (b) Estimates of the impacts on the overall population of badgers in Britain;
- (c) An assessment of the wider impacts of culling strategies on nature conservation;
- (d) Any attempt to predict the speed with which culling would deliver a benefit over cost;
- (e) Any attempt to predict how long culling would continue; and
- (f) Any proposed exit strategy from badger culling.

26. Using the Freedom of Information Act 2000, the Badger Trust has asked Defra to provide GIS datasets that would allow us to model the impacts on badger populations ourselves. This would be easy to do: Defra itself quotes studies that link badger population densities to land cover types and this data, too, is available in GIS format. Modelling the impacts of culling on badger populations should be a simple exercise for, for example, the Central Science Laboratory's Woodchester Park team.

27. But Defra has refused to provide the data on the ground that it is Crown Copyright and the location of infected farms is confidential. Anticipating this, we also asked Defra what impact on badger populations its culling strategies would have. We pointed out that Defra would need to know the answer to this question in order to ensure that the Government was complying with the Berne Convention. Again, Defra has refused to provide an answer, stating that:

*"There are no accurate figures of the badger population in England and Wales in terms of location. Defra have begun a detailed population survey in bTB hotspot areas. This would provide baseline data for monitoring the impact of any culling policy, that might be introduced following the current consultation."*¹⁸

28. It is extraordinary that Defra has launched a consultation on the widespread extermination of a protected species in its European stronghold, with no idea as to the impacts these policies would have. But such responses also fuel distrust of Government. Defra's consultation states that "culling efficiency [in the RBCT] has recently been estimated by Defra at 20-60%". Defra cannot have estimated culling efficiency without reliable badger population estimates in the culling areas.

29. So, either Defra could use those population estimates quickly to extrapolate the impacts of culling policies and provide us with an answer. Or the quoted estimate of "20-60%" culling efficiency is not reliable and might even be interpreted as a blatant attempt to undermine the results of the RBCT. Certainly, the figure is hotly disputed by the ISG.¹⁹

30. Either way, this blatant and clumsy contradiction confirms that far from communicating in an open and transparent way, Defra is actively suppressing information that is vital to an informed debate. There can be little doubt that tens of thousands of badgers would be slaughtered. The Badger Trust believes that Defra simply does not want to admit it.

31. There is further evidence that Defra pro-actively suppresses information that undermines the case against badgers or does not justify badger culling. For example, under the Freedom of Information Act 2000, we asked Defra why it failed to publicise hugely significant and ground-breaking research by the University of Oxford, which showed that cattle movements substantially and consistently outweighed all other variables for predicting bTB outbreaks. In its reply, Defra stated:

*"As a retrospective correlation of existing cattle movement data with outbreaks of TB, and with no badger data included, it is not likely that a formal press notice would have been considered appropriate."*²⁰

¹⁸ Gavigan, G (31 January 2006), response to FoI request, ref RFI 907, Defra, London.

¹⁹ Woodroffe, R (25 January 2006), personal comment at ISG Open Meeting, London.

²⁰ Tuck, C (1 November 2005), response to FoI request, ref RFI 756, Defra, London.

32. In stark contrast, Defra did publicise an early cost benefit analysis that supported badger culling even though it was incomplete and based on unverified data. Defra argued that this was worth publicising because:

*“The Government Strategic framework for the sustainable control of TB in GB specifically refers to the study to integrate scientific models to establish the overall costs and benefits of badger culling options . . . Ministers had referred to the cost-benefit of badger culling options publicly, including in the House of Commons. In view of this, and of the anticipation that there would be particular public interest in the outcome of the work, it was felt it would be helpful to highlight the key findings.”*²¹

33. It is hard to believe that the farming community would not have had particular interest in the findings of the cattle movement research, let alone the wider public. The Badger Trust notes that the Science Advisory Council has since criticised Defra for “the on-going secrecy around bTB research which resulted in different groups or individuals only seeing part of the picture at any time”.²²

E. A FAILURE TO APPLY RISK ASSESSMENT AND COST BENEFIT ANALYSIS

34. “Apply risk assessment and cost benefit analysis within an appropriate economic model.”²³

35. Is Defra using an “appropriate economic model” to justify killing badgers in its partial Regulatory Impact Assessment (partial RIA)? We contend that the answer is: No.

36. In the partial RIA, Defra’s rationale for intervention is:

*“20. Veterinary advice is that fundamental principles of infectious disease control need to be employed to reduce the risk of transmission of disease from badgers to cattle. At present, the only method known to reduce the number of infectious badgers is lethal removal. This would permit a balanced approach to bTB control that deals with the principle transmission risks.”*²⁴

37. This odd statement makes an unexplained jump, from identifying the “risk of transmission” as the problem to reducing “the number of infectious badgers” as the solution. It implies that the “fundamental principles of infectious disease control” are simply “lethal removal”. No mention is made of preventative measures, which are also a fundamental principle of infectious disease control.

38. Thus, it could also be argued that: “The risk of transmission of disease from badgers to cattle should be reduced by the implementation of biosecurity measures.” Defra simply ignores this possibility.

39. Research by the Central Science Laboratory, scheduled for completion in December 2005, should indicate what basic husbandry measures might limit badger to cattle transmission.²⁵ Some early work in this area has already been published, although the small sample sizes involved do not permit assumptions to be made about the effectiveness of preventing badgers accessing cattle feed.²⁶ Studies of farm level risk factors by the ISG should identify predictors for bTB outbreak risk that may, in turn, lead to the development of preventative measures.²⁷ Furthermore, the Science Advisory Council has advised that:

*“The adoption of potentially effective precautionary control measures, which involve relatively low costs and are not controversial, need not await the same standard of scientific evidence as those which are costly and/or controversial. However, the effectiveness of such measures should be monitored.”*²⁸

40. Unfortunately, over the last ten years MAFF/Defra officials chose not to investigate such measures with the same enthusiasm as they killed badgers. This disgraceful research void means that the ISG is unable to advise on what might happen were badgers not killed and attention was instead focused on cattle controls and biosecurity.²⁹ This question must be answered before killing badgers is considered.

41. The RBCT shows that each method of killing badgers has an inherent risk of making the bTB situation worse. Smaller scale culling introduces a detrimental perturbation effect. Larger scale culling, required over areas of at least 300 sq km, is impossible to implement effectively. Defra advises that:

“27. In conclusion, the introduction of effective badger control measures alongside cattle measures, has the potential to make, over time, a contribution to disease control objectives in high incidence areas. However, the level of risk presented by perturbation is unknown and cannot be ignored.”

²¹ Tuck, C. (1 November 2005), *op. cit.*

²² SAC (13 October 2005), Draft Minutes, 7th meeting of the Science Advisory Council: 11 October 2005, SAC (05) 25, London.

²³ Anderson, I (2002), *op. cit.*

²⁴ Defra (2005), Partial Regulatory Impact Assessment, consultation document.

²⁵ xx An investigation of potential badger/cattle interactions and how cattle husbandry methods may limit these, Defra research contract SE3029, unpublished.

²⁶ Garnett, B T, Delahay, RJ and Roper, T J (2002). Use of cattle farm resources by badgers (*Meles meles*) and risk of bovine tuberculosis (*Mycobacterium bovis*) transmission to cattle by badgers. *Proceedings of the Royal Society Series B: Biological Sciences Vol 269, No 1499. Cover Date 22 July 2002.*

²⁷ Gettinby, G. (25 January 2006), personal comment at ISG Open Meeting, London.

²⁸ SAC (September 2005), Independent review of research on bovine tuberculosis (bTB), Report and recommendations, SAC-TB (05) 4 Final report.

²⁹ Bourne, J (25 January 2006), personal comment at ISG Open Meeting, London.

42. It is not true that the level of risk presented by perturbation is “unknown”. The RBCT has shown that reactive and proactive culling strategies can lead to perturbation effects of 27% in the culling area and 29% around the culling area respectively. Defra attempts to sidestep this inconvenient evidence by arguing that, with no “badger management” (ie killing):

“53. It would be expected that the current trends for increase in incidence and spread of the disease in high incidence areas would continue. The current loss per herd due to bTB would persist.”

43. This disgraceful claim is not based on any evidence. It simply ignores the possibility that the incidence and spread of the disease will be significantly reduced with the introduction of effective controls on cattle.

44. In Northern Ireland, a paper commissioned by Defra reveals, a reduction of bTB outbreaks of 40% has been achieved in just one year by “very strict application of an annual skin testing regime, giving no opportunities to delay herd tests and testing herds contiguous to breakdown herds”.³⁰ The authors of this paper add that:

“In GB, where the frequency of herd testing with the tuberculin skin test is determined by previous information on presence of bTB, herd testing is not being used optimally as a bTB surveillance tool, compared, for example, to its use on an annual basis in RoI and NI.”

45. This brings us to the heart of the problem with Defra’s economic model: it is too simplistic. First, it contains out-of-date information. The underlying cost benefit analysis hypothesises that badgers cause 80% of bTB outbreaks. Yet Animal Welfare Minister, Ben Bradshaw, has told the House of Commons that:

“Eighty per cent of TB cases are spread from cattle to cattle.”³¹

46. Second, and more importantly, the model costs the killing of badgers in isolation from cattle controls. There is no effective, integrated economic model that allows Defra to make combinations of different policy options to come up with the most beneficial and cost effective solution. Modelling the costs and benefits of one strategy in isolation from another is nonsense.

F. A FAILURE TO USE DATA IN SUPPORT OF INTELLIGENCE GATHERING AND DECISION MAKING

47. *“We have already identified the issue of inadequate information flow. Put simply, those at the top responsible for major decisions were not provided with timely, accurate and relevant information about what was happening on the ground.”³²*

48. The *Lessons to be Learned Inquiry* noted that one limiting factor in addressing the FMD epidemic was a lack of robust data on sheep movements, a clear understanding of livestock movements in general and a good knowledge of trends in the livestock industry at farm and market level. Addressing FMD was hampered by a lack of reliable data on progress, such as how rapidly infected stock were slaughtered.

49. The Badger Trust believes that a similar problem exists with bTB. Whilst a vast reservoir of data has been gathered on badgers and their ecology, there is a conspicuous lack of information about the mechanics of the cattle industry and the extent to which that might contribute to the spread and persistence of bTB, both now and into the future.

50. The Krebs Report noted that the number of breakdowns in England began rising in 1988.³³ Some individuals have blamed this increase on an alleged “explosion” in badger numbers. Yet no attempt has been made by Defra to determine whether the increasing trend in bTB correlates with changing trends in the cattle industry. This should be a key part of Defra’s ongoing, dynamic risk assessment.

51. For example, England has the largest herd sizes in Europe and economies of scale mean that: “Average herd size is expected to increase more rapidly than it has done in the past”.³⁴ We now also know that larger herds are more likely to experience a bTB breakdown.³⁵ The period since 1998 has also seen rapid growth in the number of large holdings, with the largest holdings acquiring an additional 4% of crop and grassland between 1998 and 2003.³⁶ Many farms are increasing their production of suckler beef cattle³⁷ or increasingly specialising in areas such as the production of heifers for sale.

52. What effect on bTB might have resulted from the shift to larger herds and holdings? Is there a herd size threshold beyond which the bTB current skin test fails to clear up infection, leading to more repeat breakdowns? What effects might have resulted from the introduction of milk quotas in 1984 and subsequent industry adjustments? Has greater specialisation led to an increase in the number of cattle traded between different specialisms? Is the trend towards larger herds universal or confined to certain areas?

³⁰ Wilesmore, T and Taylor, N (September 2005), A review of the international evidence for an interrelationship between cattle and wildlife in the transmission of bovine tuberculosis, University of Reading.

³¹ See *Hansard* online at: www.publications.parliament.uk/pa/cm200506/cmhansrd/cm051117/debtext/511117-02.htm

³² Anderson, I (2002), *op. cit.*

³³ Krebs, J (1997), *op. cit.*

³⁴ Defra (2005), A study of long-term trends affecting the farming industry, London.

³⁵ Clifton-Hadley, R (25 January 2006), personal comment at a meeting of the Zoological Society of London.

³⁶ Defra (2005), *op. cit.*

³⁷ Upton, M (October 2005), Farmers’ adjustments in response to increased regulatory costs, University of Reading.

53. As a result of BSE, and later FMD, reliable data are now available on cattle movements. Oxford University used this data to confirm that cattle movements substantially and consistently outweigh all other variables for predicting bTB outbreaks.³⁸ The ISG has since pointed out that 86% of livestock movements originating in bTB hotspots remain in hotspots.³⁹ Nevertheless, there has been no further modelling to assess whether these localised movements are also good predictors for outbreaks. This matters, because the National Farmers Union claims that whilst emerging hotspots are the product of livestock movements, outbreaks in existing hotspots are the result of badger infection.⁴⁰ Modelling the links between local cattle movements and bTB outbreaks would clarify this issue.

54. A lack of holistic thinking about bTB and the potential causes of its spread other than badgers means that “those at the top” might well be unaware of significant changes on the ground that pose new and future challenges to bTB control. The FMD disaster strongly suggests that a better usage of cattle industry data is needed to inform decision-making about bTB and its control.

G. A FAILURE TO BASE POLICY DECISIONS ON THE BEST AVAILABLE SCIENCE AND TO USE CLEARLY UNDERSTOOD AND TRUSTED PROCESSES FOR MAKING USE OF SCIENTIFIC ADVICE

55. “*The Government felt it had little choice but to accept the advice it received on these matters from the Chief Veterinary Officer and the Chief Scientific Adviser. But the process of determining and responding to that advice should have been better. It was certainly not in line with the recommendations on scientific advice made by The BSE Inquiry.*”⁴¹

56. The Badger Trust notes a stark difference between the following two statements:

“The reactive triplet results were reported in November 2003 as showing a biologically unexplained 27 % increase in herd breakdowns compared to the survey-only triplets, at which point Ministers suspended the reactive treatment. Subsequent spatio-temporal analyses of the reactive culling data have shown equivocal results. Further analyses of the data need to be undertaken before conclusions may be drawn.”

“The Irish Four Areas Trial published in January 2005 (Griffin et al., 2005) is the latest published evidence showing that removal of badgers has been effective in reducing bovine TB in the Republic of Ireland.”

57. Both statements appear successively in Defra’s partial RIA. But whilst the first highlights potential weaknesses of the RBCT’s reactive cull (weaknesses which have since been addressed by further in-depth analysis of the data), the second implies that the Irish Four Areas Trial yielded conclusive results with no weaknesses.

58. Defra fails to mention that analysis of the Irish data by the ISG, using its own findings in the RBCT, have revised the Irish “success” downwards from headline-grabbing reductions in bTB of up to 96% to a mean of 54%. Moreover, the Irish study’s extraordinary failure to include a scientific control (a fact conveniently ignored by its advocates) has resulted in the ISG speculating that the Irish study has exaggerated the benefits of badger culling.⁴²

59. The question arises as to whether Defra is basing its consultation on the “best available science”. We contend that the best available science is that published in *Nature*, by the ISG. It is not simply that *Nature* is one of the world’s most respected journals with the highest standard of peer review. More importantly, the ISG’s work represents a field study of substantial statistical power and with a proper scientific control. The Irish Four Areas Study, we suggest, is not in the same league. Yet Defra’s treatment of the two studies in the consultation is far from even-handed.

60. The Badger Trust believes that the Government’s proposals to slaughter badgers have been rushed out with undue haste because a decision to slaughter badgers has already been made. In 2004, civil servants told Professor Charles Godfray that:

*“... if the [Randomised Badger Culling] trial yields a benefit from culling and therefore provides the unambiguous evidence of causation we could very rapidly work up more effective, easier, cheaper, and undoubtedly more controversial means of culling badgers.”*⁴³

61. Alarming, at the same time, the civil servants advised that their response might “vary considerably from experimental methods”. It appears that officials were so sure of their ground that they were determined to kill badgers using strategies based on little more than guesswork and prejudice. There is certainly little evidence of any intention to use sound science.

³⁸ Environmental Research Group Oxford Ltd (2003), *op. cit.*

³⁹ Bourne, J (26 January 2006), *op. cit.*

⁴⁰ Rowe, J (2005) various media interviews.

⁴¹ Anderson, I (2002), *op. cit.*

⁴² Bourne, J (26 January 2006), *op. cit.*

⁴³ Godfray, C (chairman), 4 March 2004, Independent Scientific Review of the Randomised Badger Culling Trial and Associated Epidemiological Research, Defra.

62. We were appalled to learn that the Government's proposals were published despite being "inaccurate in important respects",⁴⁴ strongly suggesting that the Government has not made effective use of its own Independent Scientific Group.

63. We draw the Committee's attention to the fact that the advice of the Chief Scientific Advisor is included in the partial RIA published on 14 December 2005:

"25. . . . After considering the scientific evidence including a review of the international literature that he commissioned and advice from the Science Advisory Council, Defra's Chief Scientific Adviser has concluded that, on balance, badger culling can contribute to a reduction in herd breakdowns if intensive removal over a wide area is practised, but it does not allow any recommendations to any particular approach to culling or provide any means of predicting the effectiveness in terms of reduction of herd breakdown. However, data from interim analyses of the proactive element of the RBCT indicate that, if not conducted efficiently and over a wide area, there is a possibility that culling could lead to an increase in the spread of disease due to perturbation effects; this needs further, careful analysis."

64. Yet we now know that the Chief Scientific Advisor did not receive the views of the SAC on the proactive culling results until the SAC wrote to him on 20 December 2005, *after* the partial RIA was published.⁴⁵

65. In short, there is no evidence that the Government is using clearly understood and trusted processes for making use of sound science. All the implications are that Defra officials decided to kill badgers well over a year ago. Now that sound science indicates that this is likely to make things worse or be totally impractical, the Department is simply making things up as it goes along, clutching at any straw that justifies a decision that is already made.

66. There are two implications. First, the consultation exercise itself has no value because it is based on a highly partial and deeply flawed presentation of the evidence. The consultation is at best meretricious and at worst deceitful, and we condemn the Minister for embarking upon it.

67. Second, this sham will inevitably result in a deep distrust of Defra's claim to make effective use of sound science. Defra's failure to incorporate the advice of the ISG, the SAC and the Chief Scientific Advisor into the consultation in an open and transparent way betrays the reality that officials continue to bend and manipulate the information to suit a pre-existing policy position.

H. OPTIONS FOR THE FUTURE

68. The Badger Trust notes the advice from the ISG,⁴⁶ stating that the Government's first two options for badger culling (individual licensing and farm-scale culling) will "seriously worsen" the bTB situation. We note that the Government's third option—killing badgers over a wide area—underestimates the scale of culling required. The ISG advises that killing would need to be delivered over areas of at least 300 km sq and that Defra's estimate of 100 km sq is "at variance" with the ISG's findings.

69. The Badger Trust believes that the eradication of bTB is not a realistic option with the tools currently at our disposal, including killing badgers. The best that can be achieved is the effective control of bTB in cattle, using improved cattle controls and bTB testing. In addition, we urge that research into minimising the risk of transmission from badgers to cattle is fast-tracked.

70. We predict that, if properly implemented and enforced, pre-movement testing, more frequent bTB skin testing and the use of the gamma interferon bTB test in herds with multiple reactors will rapidly reverse the growth in bTB and significantly reduce the problem.

71. We argue that it is a far better use of public funds to invest in measures to minimise the risk of transmission from badgers to cattle on farms, through effective grant schemes. We contend that such schemes will address not only the challenge of bTB but also a range of other farm animal health and welfare challenges. Richard Sibley from the British Cattle Veterinary Association has estimated that 250,000 cattle die every year due to diseases that are preventable,⁴⁷ That is ten times the number of cattle slaughtered for bTB, yet this figure rarely makes the headlines because the industry knowingly absorbs the costs.

72. The Lessons to be Learned Inquiry was quite clear in its recommendations to "reduce livestock vulnerability by reforms in industry practice" and to "minimise the impact of any outbreak". It is quite clear that both of these objectives can be rapidly achieved solely by focusing on cattle. We believe that further evidence will rapidly emerge to illustrate how minimising the risk of transmission from badgers to cattle will be a more cost effective and certainly more palatable solution than exterminating tens of thousands of one of Britain's most popular and treasured wild animals.

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⁴⁴ Summerskill, M (20 January 2006) Open letter from the ISG to TB Stakeholders. The ISG notes that culling would need to cover areas of at least 300 km sq, but the consultation makes no mention of this.

⁴⁵ SAC-TB(05)5 Supplementary Report (Final).

⁴⁶ Summerskill, M (20 January 2006), *op. cit.*

⁴⁷ Sibley, R (2003), Rethink health strategies. Farmers Weekly, 28 February 2003.

Witnesses: **Mr Tim Bennett**, President, National Farmers' Union, **Mr Meurig Raymond**, Vice President, National Farmers' Union, **Mr David Williams**, Chairman, Badger Trust and **Mr Trevor Lawson**, Media Adviser, Badger Trust, gave evidence.

Q52 Chairman: We are ever so slightly behind schedule, but nonetheless may I welcome our next set of witnesses to come before us, and I would like to welcome on behalf of the National Farmers' Union Tim Bennett their President and Meurig Raymond their Vice President, and on behalf of the Badger Trust Mr David Williams their Chairman and Mr Trevor Lawson their Media Adviser. I do appreciate that you may not entirely share the same agenda, and I am grateful to you for agreeing to sit on the same table. Obviously, we would like to try and ensure that we get as balanced a point of view from both of you, and again I would say to you that if you want to intervene if a question is not directly addressed to you, please indicate and I will do my best to bring you in. Can I just again say for the record, in case you were not in at the beginning, we are focusing on the questions that have been asked in this consultation process, we are not trying to have a universal inquiry into this complex matter in the shape of one evidence session in one afternoon, that would be an insult to the complexity of the subject, but we are looking specifically at the nature of the consultation exercise. I just want to start, if I may perhaps, to both sets of witnesses with a point that came out of Professor Bourne's concluding observations when he said that the Independent Scientific Group had not been consulted by Defra about the nature of the consultation exercise; the first time that he saw it was the day before it came out. Could I ask whether the Badger Trust had any approaches about the questions that should be asked?

Mr Williams: No, we were invited to see Mr Bradshaw on December 14, he just outlined it verbally, so we had no indication.

Q53 Chairman: What about the National Farmers' Union?

Mr Bennett: It would be the same. We obviously had discussions with Mr Bradshaw, but in terms of framing the consultation document the first time we saw it was when it appeared.

Q54 Chairman: Mr Lawson?

Mr Lawson: Thank you, Chairman. I might add that the Badger Trust under Freedom of Information has asked Defra how often the Minister has met not only the ISG but also the farming lobby groups as well, and Defra has simply told us "frequent occasions" and failed to give a detailed answer to the question that we asked.

Q55 Chairman: It is like some of the Parliamentary answers that we get; you just have to go back and ask the question all over again. I would be interested to hear from both of you as to what you think, because I asked the question about the weighting effect. The questions which the Minister has put forward are given equal weight in the consultation document, but in terms of the ones that are absolutely crucial, which are the ones from your respective standpoints that you would, if you like, put at the top of the list?

Mr Bennett: The important emphasis is that this is a disease that, frankly, we have not been tackling. When I was a student just over 30 years ago we had virtually eradicated this disease, and so the way we have approached this with the Minister and others over the last 18 months is to try and find a strategy to once and for all reduce and hopefully move towards eradication of this disease. To be quite blunt, because of the absence of science moving on we feel science has let us down very badly on this disease, and the fact that I am still using the same diagnostic test on my cattle as when I started farming and the fact that I was told we were going to have a vaccine ten years ago, 25 years ago, and it is still ten years away, means that the science has failed us in this respect, so what we have got to do is work with the tools we have got. We have to look at whatever we can for cattle to cattle and indeed in the badger to try and reduce this disease; others have managed to do it and we stand out as a country that has failed to do that. We have approached this in a very open way about making sure that we would accept from the cattle perspective that we have to do more, providing that we do tackle the wildlife reservoir as well. That has been the principle of our approach all the way through.

Q56 Chairman: Have you got your own independent (if that is the right way of phrasing it) scientific back-up that informs the policy position which the Union has taken on this matter?

Mr Bennett: We look at the science from around the world as well as the science in this country.

Q57 Chairman: Are the people who look to advise you as President scientifically qualified, because we hear, for example, about the question of the science that lay behind some of the assumptions that underpin the Defra questions on culling, and I was interested to know whether you thought that the science had been properly used in that context in informing the questions that were in the document. Have you got your own scientific advisers who are underpinning the opinions you are giving us?

Mr Bennett: We have obviously got a scientist who works for us, but we have also underpinned it by what has happened in other parts of the world in terms of trials—and indeed some of the trials that have gone on in the past in this country. We have used the evidence that everyone else has got, Chairman.

Mr Raymond: Can I just follow that up. Obviously we have expertise in-house, but we also studied the Four Areas Irish trial results, we have looked at what has happened in New Zealand and we have also looked at what has happened across the rest of Europe. We in the United Kingdom do stand out, and we used all this evidence when we collated our document last summer which we passed on to the Minister.

7 February 2006 Mr Tim Bennett, Mr Meurig Raymond, Mr David Williams, and Mr Trevor Lawson

Q58 Chairman: One last question on this, for example, in the context of the Irish trials Defra say that you cannot make a direct comparison because there are essential differences. Do you agree with the science that underpins that analysis?

Mr Bennett: You can make comparisons with the Irish trial. There are some differences; that will be to do with badger density, because their badger population density is less, but they have results, for example, in using snares, which is something we have not been used to, but again it adds to the science in terms of the method of culling. So, yes, we have used that and Meurig has actually spent some time in Ireland talking to the people involved in it and making sure that we are well-informed, because that is a country that has actually reduced its bovine TB incidence and we want to learn from those who have managed to decrease as opposed to increase, which is where we are at the moment.

Q59 Chairman: I would like to put a question to the Badger Trust on the same line of analysis; do you feel that the questions that are posed in the consultation document give sufficient opportunity to probe the stance that you have taken, which I think is against the use of culling?

Mr Lawson: Thank you, Chairman, the short answer to that question is no, they do not, as I am sure you expect us to say, but to be more specific about it, what we have done in our submission to you is we have put this consultation in the context of the recommendations of the foot and mouth inquiry, and what we are arguing is that the questions do not match up to the standard set by that inquiry in terms of what is being asked and what constructive approach the Government has taken to dealing with this problem, such as, for example, being more creative in its thinking in terms of how it addresses the issue. In terms of the specific questions, in terms of the weighting, which was the question you asked originally, we would obviously give greater weight to the first question, the principle, which is should badger culling be part of an approach to control bovine TB in hotspot areas? The reason we give weight to that is because we think the answer to that is no, for the very simple reason that the science shows that either it will make the situation worse, or it would have to be done on such a scale that it is impractical. Following on from that we have a further problem, and that is the questions that are not asked; that is where we have the real problem.

Q60 Chairman: That is a very interesting point. What additional questions should be in it?

Mr Lawson: There are quite a few, but let me give you some of the key ones first. The most straightforward question is do we have enough information to actually embark upon this process now, because we do not think there is enough information. We have plenty of data about what happens if you cull badgers, but there is virtually nothing in terms of reliable scientific data on, for example, what biosecurity measures might be effective, so you cannot compare like with like because there is a gross imbalance in the research.

Also, we need to ask what else could be done and in what order should different mechanisms be applied? For example, should we apply culling of badgers alongside the increased testing of cattle; how do we distinguish between them if we do? Those sorts of questions are not coming up. What combination of strategies could be developed; they are presented as either/ors, there are no variables in terms of different strategies combined. What timescale should they extend over? Again, there is no indication as to how long we would be culling badgers or if we got into it, what area should be covered and, perhaps the biggest question no one has actually asked, is the eradication of bovine tuberculosis feasible? There is an underlying objective in Government to eradicate bovine TB; the Government has already conceded that that is not feasible in a ten year time scale of the animal health and welfare strategy, but we would go further, we are of the opinion that TB cannot be eradicated and to talk in terms of it being possible is living in cloud cuckoo land.

Q61 Daniel Kawczynski: Thank you, Chairman. Are you allowed to say you fundamentally disagree with evidence? I fundamentally disagree with Mr Lawson and my question is to Mr Bennett specifically. You can understand how passionately I feel about my Shrewsbury farmers, and one of my dairy farmers was recently interrogated by the police and had all his guns confiscated for allegedly shooting a badger. He said to me that if I had reported my house as being burgled, nobody would have turned up, but the fact that he had allegedly shot a badger, three police cars turned up and interrogated him. My question to you is bearing in mind you represent the NFU, what progress have you made specifically with regards to Defra in convincing them of the urgent need for culling badgers?

Mr Bennett: Let me put it this way, it is pretty obvious after all the years that we have been talking about this—Chairman, you have been involved in more than one inquiry into this—the incidence of bovine TB has actually increased year on year and the more you put protection in, incidentally, including the moratorium in 1997 from the present Government, the more bovine TB has increased. Incidentally, there are no more cattle in this country and there are no more movements, so that is a myth. If we are going to really reduce bovine TB in this country you have to tackle the disease, both in cattle and in wildlife, otherwise it will be completely ineffective and you will not get anywhere. In terms of talking to ministers, there is an acceptance that we just cannot go on like this. If you look at the outside world, if you talk to others across the world and particularly in Europe they look on this disease and say why have we failed to tackle this problem? Everyone else has seemed to manage to do it, what are we doing differently? Even the Irish, who had a particular problem, have managed to reduce it, so the NFU's position is very clear, we feel that a badger cull is an integral part of reducing the incidence of bovine TB. Until you accept that point

and until there is some political acceptance of that, we are not going to actually make a big difference to this disease.

Mr Lawson: Just briefly responding to what Tim said there, it is interesting that we appear to be the only country that has not solved bovine TB, I beg to differ, Chairman; they have still got a bovine tuberculosis problem in the United States, they have still got a problem in New Zealand and they have still got a problem in Ireland where they have been killing badgers in vast quantities. It is not just in this country that bovine tuberculosis is a difficult and complex issue to deal with.

Mr Bennett: It is much reduced.

Mr Raymond: Can I respond to that, because I would not agree with a view that we cannot eradicate bovine TB in the longer term. Obviously, initially we have to contain and then we have to eradicate. The New Zealanders have proven that it can be done, the Irish are well on the way I would suggest, and when we look at the statistics in this country over the last 12 months we have seen the incidence rise by 30%. Where I believe the Irish have benefited from their Four Area trial results is when they set defined geographical boundaries and culled within those boundaries, the incidence of bovine TB reduced quite dramatically. When we keep seeing bovine TB in the cattle herd increasing by 30% per year, I would suggest Government has to do something, and the pressure is there from the European Commission as well.

Q62 Chairman: Can I just stop you at that point because I want to reiterate what I said at the beginning. I know there are some very strongly held views; what I am anxious to tease out of our exchanges is are there any questions that ought to be in this consultation that would enable both parties to give the Minister full vent to the views that you are putting forward? Please bear that in mind in responding to our questions. Tim.

Mr Bennett: Trevor mentioned biosecurity earlier and I have also listened to the scientific view. The idea that farmers do not regard biosecurity as important is very sad, because they do—and I have to declare that I live in a one year test area myself, I have badgers on my farm and so far they are healthy and that is the way to keep them—and the idea that actually it is all about buildings and badgers is a joke. If you shut doors and stop the airflow you are going to get other disease problems for the animals such as pneumonia, so let us accept that farmers understand husbandry. Most of the breakdowns in linking with the badger link are when cattle go out in the spring. Very often, if you look at the evidence, we manage to clear herds and get the reactors away, then you turn them out to graze in the Spring, they mix with the badger in terms of being on the grassland and, by the Autumn, you have normally got reactors again and it takes you all the Winter and sometimes much longer to cure them. A lot of us have been trying to make sure that badger runs do not interfere where you are grazing cattle, but it is

virtually impossible, and some of us spent thousands of pounds doing that. The idea that farmers do not try and separate out, I will not accept that.

Q63 Mr Drew: Could I just take us a bit closer to home, which is Northern Ireland, which as you know has introduced a pre-movement testing regime which seems to be so far successful. I know there is an argument about whether it has been scientifically evaluated, but could I ask both the NFU and the Badger Trust to what extent have you drawn on evidence from Northern Ireland? Forget New Zealand and the States and Ireland, let us look locally; what does that tell us?

Mr Lawson: Thanks for that question. We have pointed out in our document that according to a Defra research paper that has been published they have reduced bovine tuberculosis by 40% in Northern Ireland between November 2004 and November 2005 by tightening up on the TB testing regime; that is a huge reduction in a very short space of time. It is also worth pointing out—and we raised this with the Minister when we met him—that the whole of Northern Ireland is on an annual testing regime. In this country the ISG recommended, I think it was back in 2002, that annual testing should be the norm across the whole of the country in order to deal with this problem, and that has not happened, and it has gone on to say in terms of the report from Tony Wilsmore² that has come out from Reading University that in Britain we are not using TB testing in anything like the efficacious way that we could be in order to control the disease. One other thing I would add about Northern Ireland which is interesting is that I met Mr Wilsmore when I was doing a radio interview recently and he commented that the information on Northern Ireland has come from his own sources over there in the veterinary profession, not through Defra. We were surprised by that; it appears that within Defra there is a lack of communication with what else is going on in other places.

Mr Raymond: On the issue of movement of cattle, the difference in Northern Ireland to ourselves is that obviously we have got pre-movement testing designed to come in on 20 February, which is where Ireland benefit because they have a free pre-movement testing service. I think that would be a huge advantage in this country.

Q64 Chairman: You would support that then?

Mr Raymond: I would support pre-movement testing of cattle as long as it was free at the point of delivery and as long as it is a realistic approach and it is very much part of a wildlife strategy at the same time. You can speak to veterinary surgeons on the ground and they will tell you to your face that unless there is a wildlife cull in these hotspot areas—

² Tony Wilsmore and Nick Taylor, *A review of the international evidence for an interrelationship between cattle and wildlife in the transmission of bovine TB*, (Reading University, September 2005)

Q65 Mr Drew: They are not doing that in Northern Ireland are they, there is no culling going on in Northern Ireland?

Mr Raymond: No, but the evidence on the ground—we can just look at the statistics over the last 12 months where there have been herd breakdowns, where we have closed herds, where there is no purchase of cattle onto farms, very little cattle moving off that farm and there are still breakdowns, and those breakdowns are coming from wildlife. There is no doubt about that, the numbers of badgers have risen at a dramatic rate over the last number of years, they are very social animals and it is the diseased badgers that are the badgers that have been forced out of their setts, and these are the badgers that drift towards the farm buildings, looking for new setts, looking for feed, and I honestly believe—and the evidence is there to prove—these are the badgers that are helping to contaminate the cattle population. As Tim has said, we will see a huge increase in bovine TB in cattle, particularly when livestock go to grass and that again highlights this issue of diseased wildlife contaminating cattle. We all know there is transmission from cattle to cattle, cattle to wildlife, wildlife to wildlife and wildlife back into cattle. It is a vicious circle, we have to break every link in that chain if we are going to contain and eradicate this disease.

Mr Bennett: Surprisingly, I agree with Trevor on something, and that is I do not think at times our testing regime has been as good as it should be. What I mean by that is that where you have breakdowns of cattle that have been moved it sometimes takes months to trace them back. For example, if you are selling store cattle onto finishing units and you get a breakdown of the finishing units, it is sometimes taking months to get back to the source of that and actually test those cattle. What I have to say is that the testing regime has not been perfect in the past, but it is under pressure. When it comes to pre-movement tests of cattle, in most of these areas, the hotspot areas, the vets are working flat out and have probably got a two to three months waiting list in terms of annual testing. To then impose a pre-movement test without proper consultation—remember, Chairman, there has been no proper consultation on pre-movement testing about how this is to be done. As we sit here today, if the pre-movement test comes in on 20 February, we should be testing cattle today then get the results next week, to be able to move cattle the week after. Nobody knows how it is going to be done, no one has got the paperwork and so there has been no thought as to how pre-movement testing is going to come in. In fact, I have written to the Secretary of State to point this out and, effectively, the lack of consultation and organisation on this means that we will probably be in the law courts.

Mr Lawson: I will just pick up on that one again, though I think we are in agreement on this. Our concern about the pre-movement testing strategy, whilst we welcome it, is that it is not at all clear how Defra is going to enforce it. For example, as far as

we understand it, markets will not require a pre-movement test certificate before they sell livestock on, it is going to be *caveat emptor*, buyer beware, and we are not quite sure at what point along the chain the Government will ensure that pre-movement testing has been complied with. One of the potential problematic consequences of that is how are we going to then monitor whether pre-movement testing is actually having a beneficial effect, so there is a real issue there that needs to be addressed. In addition, responding to this issue about breaking the chain and wildlife to cattle and cattle to wildlife and so on, I would just draw your attention to a paper by the ISG in the *Journal of Applied Ecology* in 2005, *Spatial Analysis and Mycobacterium bovis infection in cattle and badgers*. In there they report: “Our finding that cattle might be involved in transmitting infection to badgers, as well as vice versa, would also have relevance to TB control policy if substantiated by further studies.” In effect what they are saying there is that if you crack down hard on cattle through effective mechanisms, you may well shrink the problem in wildlife as well. We do not know if that is the case, but the big question that no one has asked and certainly is not asked in the consultation document is what might happen if we do nothing about badgers in terms of culling them. As Dr Woodroffe pointed out, that does not mean do not try and reduce the risk of badger to cattle transmission, but what happens if we say okay, let us work hard on the cattle issue, supporting farmers through that process where necessary, for example through grants to implement biosecurity measures—and I notice that Tim felt that apparently there are not doors for barns that would allow air to circulate, but as far as I am aware a stable door does that quite well, you can keep badgers out with the bottom half and open the top half to let a bit of air circulate.

Chairman: Before we get into an inquiry into barn design, I am going to ask Madeleine Moon to move us on.

Q66 Mrs Moon: I do not know if I am going to be successful in doing that, to be honest, because it seems to me that what we have got here is a very emotional issue; feelings run very high. Farmers must know that they are going to come out of it in terms of public perception in a negative light; we are having scientists who are saying that leaving badgers alone and increasing the capacity for testing would reduce the incidence of TB in cattle; we have got statements from the scientists saying the reduction in numbers of badgers may be counter-productive. What I am not clear about, looking at the list of alternative measures that were put to us by the scientists of improving diagnostic testing control over movement of infected animals, on-farm biosecurity and pre-movement testing, albeit that you have an issue over paying for the pre-movement testing, is why it would not be more appropriate to look at those options before we look at an option that we are told has a capacity to reduce incidence of TB if you cull at 20%, but increase at 30% outside the culling area, and where we also are told we do not

have enough skilled people to actually carry out the cull. What you are therefore going to do is have a cull that is going to be ineffective and is going to have a negative effect on the results that you get anyway.

Mr Lawson: This comes back to our point about in what timescale do you operate different strategies? In our own TB strategy that we published after the ISG's research was published last year, we suggested that in terms of the order of progress we can envisage a situation possibly, way down the line in the future, where you might need to cull wildlife in areas where all other mechanisms have failed. We are not sure about the practicalities of doing that, but it might be, possibly, the only answer if you wanted to achieve eradication. But the question that is not asked in this consultation document is at what point should we introduce wildlife culling? The assumption appears to be let us get on with it now, and it makes far more sense to us to say let us do the easy stuff first, which is concentrating on cattle, and in terms of the other questions that that prompts, you mentioned the danger to the industry there in terms of public perception. We are pointing out that it is the Department for Environment, Food and Rural Affairs, it is not the Department for Farming, and one of the concerns that we have got is that no one is asking the question if farmers, or the Government as agents of farmers, are exterminating badgers all over the West Country, what are the implications of that on the consumption of traditional produce in the West Country for specialised markets? Would tourists still want to eat clotted cream that was a by-product of the extermination of large numbers of wild badgers? There could be real detrimental effects there and that could be a real problem for the farming industry.

Q67 Chairman: Mr Rogerson might want to pick up on that point in his questions.

Mr Bennett: I would like to come back and answer that question, Chairman, because first of all Trevor said we ought to find out what a no culling policy of badgers brings us. We have been running that experiment for the last 15 years and more intensively in the last few years and we know exactly where we have got today: in a pretty poor mess. In terms of all the things you suggested we should do—

Q68 Mrs Moon: No, that the scientists have suggested, they are not my suggestions.

Mr Bennett: With the exception of pre-movement testing, that is what we have been doing, that is exactly what we have been doing. What we are saying is that we are quite prepared to do something in terms of pre-movement testing because we want to get rid of this disease provided that we do take in a holistic way. Coming to public perception, we do worry about public perception because I want to make sure that we have a good public image so we can sell the food we produce, but we cannot walk away from this disease just because of public perception. Most of the British public I talk to are full of common-sense, just a small percentage are not, and when you talk to the British public about this they are very matter of fact and if they know that

the target is healthy cows and healthy badgers, which is what both of us want, then it is a matter of explaining it to them and I do not think it should have any impact on our purchase of food in the West Country.

Mr Raymond: May I just make two quick points on that? There is an issue with perturbation and I will return to what I said earlier: if there are well-defined geographical boundaries, that should ease the problems of perturbation as the Irish proved in their trials. The other area that I feel very passionately about, having been down to the South West, having been to the West Midlands in the last six months and met farmers, there is an issue of the welfare of wildlife, there is an issue of welfare of livestock, but very few people pick up the issue of welfare of farmers and their families. I have seen farmers who are at the end of their tether, whether it is mental, physical or financial and it is absolutely desperate. I fear there are certain parts of this country that will cease cattle production if this disease is not actually contained and eradicated soon, and then you have got the management of the countryside to worry about and the countryside will go in to disarray. There is an issue, therefore, and I have seen it at first-hand and it really does touch my heart, I can promise you that. There is a big issue of the welfare of the families involved, farmers that have been under restriction for three, four and five years.

Q69 Chairman: Would I derive from that that you feel there should have been a question about the human dimension of the questions that have been posed about culling included in this consultation document?

Mr Bennett: We do very strongly, Chairman, because we think this is one aspect that is missed. In terms of social implication in seemingly every other area of society it gets mentioned, but when farmers are affected and their businesses partially destroyed, when there is the pressure of constant TB testing and the fact that they have this disease hanging over them, it does lead to depression and does lead to some people saying eventually we just cannot farm cattle in these areas. It shows how serious the situation is and it should have been taken into account.

Mr Rogerson: I am slightly concerned about Trevor raising this spectre of some sort of spontaneous boycott of produce from the West Country were a cull to take place, and I hope that he would want to reassure me that that if anything like were to happen it would be a spontaneous thing and nothing that would actually be organised by anybody who is involved.

Q70 Chairman: Do not get too carried away in answering that.

Mr Lawson: No.

Q71 Mr Rogerson: Would not the NFU and the Badger Trust want to work towards some form of constructive view about how this disease can be eradicated for the benefit of the cattle but also for the benefit of wildlife as well where this disease is causing

some suffering? You have said that in terms of eradication there may be a need at some point to look at a cull, at what point do you think that would be reached if it has not been reached already?

Mr Lawson: One of the questions that is not asked in the document is what level of control of bovine tuberculosis is acceptable to all concerned? The focus on eradication, which we do not think is feasible, makes that a difficult question to answer, but we think that the public as well as the farming community and the conservation lobby would like to see an optimum level of the control of bovine tuberculosis and it would be helpful if Defra were to ask that question, what level do we want to get it down to, at which we can say okay, that is acceptable. If we assume that you cannot eradicate bovine TB the next question that needs to be asked is if you cannot get rid of it in parts of the West Country or parts of South-West Wales, what do we do then? Our position is quite clear on that, the public value farming and farmers, we have no quibble with that, it is the case, but they also value wildlife and the environment—they do not value farmers and farming at any price—which means that at some point you are going to have to say if you cannot eradicate TB you may need to introduce special compensation measures for farmers in areas where living with the problem in wildlife is going to go on because you just cannot get rid of it. Can I just answer this question about the health and welfare of wildlife? Animals die of diseases naturally and we understand that the work by the Central Science Laboratory, Dr Cheeseman's team, has shown that TB is not an important cause of death of badgers. You are on a hiding to nothing really if the implication is that ourselves and the RSPCA and other organisations like that, who work tirelessly for the conservation and welfare of wildlife, are saying "We do not really care about sick badgers." Of course that is not the case, but we are recognising that killing tens of thousands of healthy badgers to remove a few unwell ones is not really a very constructive approach from an animal welfare point of view.

Q72 Daniel Kawczynski: Thank you, Chairman. These are really for Mr Raymond and Mr Bennett to answer, three different questions. Firstly, will the farmers want to run the risk of being targeted by activists? I mentioned this to the scientists before and it is certainly something that farmers have raised with me; they have strong concerns that if they were prepared to allow culls on their land they could be targeted by animal rights groups. Could I have your comments on that?

Mr Bennett: They are worried about the activists on this one. Meurig and I have talked to probably hundreds of farmers about this in the last few weeks and their view is that they want to co-operate in the cull but they should not be responsible for it, so we feel that the overwhelming majority of our members would be quite happy to take part in the exercise. What they are concerned about is that just the areas concerned should be identified to public knowledge and not individual farmers' names because there are

some very nasty people out there that are involved in this particular area. The other message we get very strongly is that we are there to help but we are not professionals at culling and we do need expertise to be brought in to help us.

Mr Raymond: Could I just say there is a huge responsibility on Defra here as well, and if we move ahead with this badger cull I think it is up to Defra to be part of the management of the cull, and I believe if that was the case the farmers would co-operate. Picking up Tim's point, it should be done on an area basis rather than on a farm by farm basis because then you could actually lessen the risk of individuals being targeted. Obviously, people are extremely nervous but the overriding factor in most people's minds is that we cannot be defeatist on this, we have to initially contain and then desperately try to eradicate this terrible disease out of our cattle herds and out of the wildlife in the country.

Mr Bennett: We can get down to very low levels. In the early 1970s we had just a few cases in Cornwall and Gloucester, and that is how far we can go down to. We have been there and we know how to do it, and I am hoping that the scientists at some point are going to help us on this, because we would like to actually move away from some of the options we are talking about today and just end up with a vaccine, whether that is for wildlife or cattle or both. That is the ultimate solution and surely what we are putting together here is a policy that will hold together to get the incidence down so that we can move to that point.

Q73 Mr Drew: I want to ask about that because we are looking at framing questions for the Minister. I am sure that the one thing that both sides could agree on is that ultimately, as we are human beings, the search for a vaccine would seem to be the best way forward. There is an argument over whether it is better to vaccinate the cattle, which has problems in terms of TB-free status, or the badgers in terms of catching the badgers and vaccinating them, but again this does not feature in the options forward, it is culling or nothing. That is the simplistic way and I know we are trying to say there are other ways forward, but how would you feel if Defra had actually tried to consult the public—which is what it is doing—on the idea of vaccination and spend some serious resources on it? I would remind you that we have yet to have BCG³ trials in this country—we have had them in Ireland, we have had them in New Zealand and we are about to hopefully start one in Gloucestershire, but it is not yet confirmed.

Mr Bennett: I have been asking for four years for that BCG trial. The fact is that a vaccine or BCG is not going to solve this problem in the short term; what we have to do is put together a policy that reduces the incidence of this disease so that we can move on to the next stage. That has always been the NFU's view: we have to have better diagnostic tests because, frankly, the diagnostic test is not that good at the moment and we have to move towards a vaccine.

³ BCG Bacillus Calmette-Guerin vaccine

Q74 Chairman: I like your comment about the thought of a vaccine. You remarked at the beginning that this Committee had been involved in inquiries before; I have certainly been doing them for five years and every time you ask a question about the vaccine it is always ten years ahead, the same here. It is a moving target, so there we are. Mr Lawson, 30 seconds on vaccines.

Mr Lawson: Thank you, Chairman. Just to respond to that, we cautioned two years ago that we think a vaccine is not a feasible option in the future. We cannot see it being developed for badgers because of the difficulties of inoculating badgers below ground before they get infected, and in terms of cattle there are significant genetic problems which may be overcome in the future. We have always taken the stance that it is not a good idea to encourage policy ideas if you like, or to encourage people to think that solutions are just around the corner when the contrary is true, we think it is far better to be straight with what we know than to speculate about what might be developed in the future.

Q75 Daniel Kawczynski: Going back to the questioning for Mr Raymond and Mr Bennett, it has been suggested to the Committee—although I have to say I disagree with this—that because farmers will benefit from a reduction in bovine TB they should pay their fair share for the costs of this cull. Could I have your comments on that?

Mr Bennett: I think if anyone went and talked to a farmer who is consistently shut up over a number of years and said he ought to contribute his fair share, I am not quite sure what the reaction would be. Quite frankly, the cost to individuals of this disease, the fact that you are not able to trade properly, the fact that you are constantly retesting, the labour costs alone of 60 day tests—there are massive costs on this industry. To ask them, as we start off with the pre-movement tests, to also take on those costs—which will be quite considerable, probably between £10 and £20 an animal, and I can tell you it is not a very profitable industry to be in just at the moment, as you know, chairman—the idea that the State should share the cost of this, we are carrying more than our fair share of costs. As I have said to the Minister in the past, I am quite willing to work with him to reduce the costs of this disease on Government and on ourselves because if we reduce the incidence of this disease it will be a great win for the taxpayer as well as the farmer.

Q76 Daniel Kawczynski: Lastly, in the series of three questions for you, we have touched on this briefly but what are the chances of enough landowners and farmers co-operating with any cull to make it effective?

Mr Bennett: My view is that they will. Meurig is doing quite a bit of work on this at the moment.

Mr Raymond: We are involved in an exercise at the moment where we are asking farmers and landowners are they prepared to co-operate, and I believe the answer is yes because they are responsible enough that they want to actually defeat this disease, but a lot depends on Defra and how Defra approach

this. If Defra says it is up to you, the farming industry, it puts a different perspective on it than if Defra go in to manage and take their responsibility seriously. If Defra take their responsibility seriously and be part of the exercise of the cull, then I believe farmers will be only too pleased to co-operate.

Q77 Daniel Kawczynski: Lastly, on the point of co-operation, I would like to ask both of you—because I suspect one of you are from Wales and one of you are from England—as my seat is on the English-Welsh border, my farmers who own land on both sides of the border are extremely confused with the mixed messages from the Welsh Assembly and from the Government here. Would you give me an assurance that you will try to lobby the Government to have more of a uniform approach to this issue, rather than allowing the Welsh Assembly to totally contradict what the national Government is doing on this?

Mr Bennett: I find the idea that you can have slightly different policies within the same shores as crazy. We have literally hundreds of farmers who will be farming on both sides of the border and to have a different policy is nonsense. The same evidence has been presented to both and I think what has happened in terms of England is that the debate has been going on a lot longer, it is a more grown-up debate and there is an acceptance that something now has to be done about this disease. Our policy will be absolutely clear, as the NFU of England and Wales, that we would want the same holistic policy from cattle through to wildlife in both Wales and England. It is a nonsense to do anything else at all.

Q78 Mr Drew: Can I move on to the culling options, and I will start with the NFU. Is it fair to say that the farmers who have talked to me are representative in as much as they do not like snares and the use of snaring because it is ineffective, it is counter-productive and because, dare I say, there are all sorts of problems from a public relations point of view?

Mr Bennett: It would be fair to say that our farmers believe that gassing is the best option and we would want rapid research into that—not the hydrogen cyanide that the scientists were talking about but carbon monoxide. It is perfectly possible to run trials on that, particularly with the small cameras you can push around the setts. We have been doing gas tests for avian influenza in chickens in case that dreadful disease comes, so if there is an imperative to do something, it is surprising how quickly this could be sorted out. We managed to do the chicken tests when we were in the middle of the scare in a matter of two to three weeks, so I cannot see any reason why we cannot do the same in terms of this particular issue.

Q79 Mr Drew: If we stay with the NFU and stick with gassing—I will come to the Badger Trust in a minute—who would do this gassing? Farmers? Landowners?

Mr Bennett: We need professionals. The farmers are quite willing to co-operate and gassing is one of the options, but I am saying that this has not been considered adequately. I think there are

7 February 2006 Mr Tim Bennett, Mr Meurig Raymond, Mr David Williams, and Mr Trevor Lawson

professionals there that could do this job, in whatever form we eventually take in terms of trapping, shooting or whatever, so it does not matter what it ends up as, but we do need professional people working with farmers, identifying the setts and indeed doing the culling. Farmers are quite willing to go so far but they are not professional in this particular area and this is where Defra, in my opinion, have got to do more.

Q80 Mr Drew: Can I ask the Badger Trust, what is your worst option in terms of all these measures and what is the least worst?

Mr Lawson: I am afraid our honest answer to that is that we do not think any of the measures are acceptable from a welfare point of view because each of them has its own particular horrible consequence. I am afraid I could not disagree more strongly with Tim Bennett on this, when he talks about gassing being an easy, straightforward option, in the Thornbury Trial which was carried out in the 1970s it took seven years to gas the badgers across 100 square kilometres, seven years of repeat gassing. Once you extend that to the vast areas currently covered by TB you are on a hiding to nothing, but not only that, badgers are not just on farms they are in private woodlands, they are in private gardens, they are in steep wooded river valleys that you cannot get easy access to, so the practicalities of gassing are pretty limited. There is also a really challenging welfare issue with gassing which Dr Cheeseman has already referred to, which is that you cannot get the gas right into the setts. One of the

consequences of that is that you end up with some badgers getting hypoxia, they get a lack of oxygen to the brain and they suffer brain damage. I am sorry to be cynical about this, but we think that the reason why the farming industry favours gassing is because there is a view that what cannot be seen will not hurt. In other words, if all these badgers are dying underground there will not be an objection to that. I remember when I was a kid seeing on *Nationwide*, the news programme, people being dragged away from protests about gassing when it was being carried out by the State and I cannot see any reason why that would not happen again. We certainly would not be advocating any illegal practice on the part of the people who oppose gassing, but I cannot see that that would be avoided.

Q81 Chairman: We can draw a conclusion from the two sets of comments that there does need to be a question in here about various security aspects, and it is a missing dimension to this particular inquiry. Thank you both very much indeed. You have given us your own special perspectives and we are very grateful to you. The Committee will reflect very carefully on the evidence we have received and it may be that we will want to say something more about our conclusions on this, but we need a little time for further thought. Thank you very much indeed for your written evidence and for your contributions this afternoon, we much appreciate it.

Mr Bennett: Thank you, Chairman. If there is any more evidence that you would wish to ask us, please ask and we will supply it.

Chairman: Thank you very much.

Supplementary memorandum submitted by the Badger Trust (BTB 27a)

THE SUSTAINABLE CONTROL OF BOVINE TUBERCULOSIS

A. INTRODUCTION

1. The Badger Trust welcomed the opportunity to present evidence to the Select Committee on the Government's consultation on badger culling, on 7 February 2006. This additional statement aims to clarify two of the issues raised.

B. THE IMPACT ON CONSUMERS

2. The Badger Trust was asked what further questions the Government's consultation should be posing. The Badger Trust suggested that one question should ask what impact a large scale badger cull would have on consumer's perceptions of, and demand for, farm produce.

3. Mr Rogerson commented that he hoped the Badger Trust was not advocating a "spontaneous boycott" and we were not given the opportunity to reply. It therefore seems wise to explain our rationale a little more fully.

4. Throughout the farming industry, attempts are underway to strengthen consumer's understanding of the links between food and a sustainable countryside. These include the Countryside Agency's Eat the View campaign. Its chairman, Ewen Cameron, notes that:

5. "Farmers are finding it difficult to compete in an increasingly globalised market place and despite very substantial public subsidy to agriculture, farm incomes are currently at an unsustainable level . . . but at the same time there are major concerns regarding animal health, food safety and the nutritional quality of food, as well as environmental degradation and the continued decline in wildlife.

6. “. . . There is now even greater pressure for subsidy payments based on production to be redirected towards improving environmental management. Both local and central government are beginning to realise the significance of food production to sustainable development and are starting to review policies and support local food initiatives. Consumers are also starting to show their concern about the negative effects of food production and supermarkets to recognise the competitive advantages that support for the countryside and environment might bring.

7. “What has happened in the farming and food industry raises questions for all of us. As consumers, as visitors to the countryside, as taxpayers, or as producers and processors of food, we all have a role to play in encouraging more sustainable land management.”

8. Lobbying organisations, such as Local Food Works, argue that: “A top priority for the government must now be to create a policy framework which favours a more local, sustainable trade in food.”

9. In areas where bTB is prevalent, networks exist to promote consumer links with local produce, with publicly-funded campaigns such as Taste of the Westⁱⁱⁱ. Very large landowners are leading the way. The National Trust’s Farming Forward campaign: “. . . is about promoting sustainable farming and food production for the benefit of producers, consumers, and the environment, as well as improved standards in animal welfare. We aim to promote farming methods and approaches that look after soil, water, air, biodiversity and the natural landscape.”^{iv}

10. HRH The Prince of Wales established the Duchy Originals brand to: “. . . demonstrate that it was possible to produce food of the highest quality, working in harmony with the environment and nature, using the best ingredients and adding value through expert production”^v. HRH The Prince of Wales described this philosophy as a “virtuous circle”.

11. The Badger Trust contends that proposals to exterminate badgers are not sustainable and are therefore incompatible with these national and regional trends towards achieving simultaneous benefits for farmers and the environment through consumer support.

12. We note that the Government’s consultation document, in presenting its partial Regulatory Impact Assessment, makes no attempt to factor in the economic impacts that badger culling might have on consumers’ enthusiasm for local produce in particular. We suggest that, were a cull to go ahead despite the clear scientific evidence that it would worsen bTB or be impossible to implement on the scale required, then consumers would feel betrayed by the farming community. That sense of betrayal could readily be reflected in a change in support for local farming produce.

13. Suppliers at farmers’ markets are expected to brief consumers on “production methods”^{vi} and, we suggest, the extermination of badgers would have to be cited as a relevant production method (alongside the use of pesticides, for example) that influenced consumer choice.

14. It is imperative that Government assesses the potential impact that killing badgers might have on the marketplace. For example, the volume of consumers with a direct interest in the management of the countryside can be measured, loosely, by the membership of organisations within Wildlife and Countryside Link. Those organisations alone represent an estimated 8.4 million people^{vii}. Many will be those with disposable incomes that make them predisposed to paying the premium for high quality, locally sourced produce.

15. We note that the partial RIA reports that in a survey conducted by the University of Reading, “73% [of those surveyed] objected to badgers being intentionally killed” even though “92% agreed that controlling bTB is important”. Thus, for economic reasons, there is a strong case for implementing the positive solutions advocated by the Badger Trust and others, rather than exterminating wildlife.

C. ILLEGAL ACTIVITY

16. The Badger Trust does not condone illegal activity. On the contrary, the Badger Trust won the “Partner of the Year Award” in 2005, from the Partnership Against Wildlife Crime (PAW), for its work in training and supporting the police in wildlife legislation enforcement.

17. Nor does the Badger Trust speak for those to whom the vague label “animal rights activists” is assigned. Nevertheless, we noted (indeed, it was hard to miss) a particularly repetitive line of questioning on the issue of “animal rights activism” from Mr Kawczynski.

18. Mr Kawczynski asked the NFU whether “animal rights activists” pose a threat to farmers. This was supported by the NFU, though we note the absence of any evidence to back the assertion. The Badger Trust was not given an opportunity by Mr Kawczynski to comment on this issue. We would like to take this opportunity to inform the debate.

19. On 8 February 2001, the then Agriculture Minister, Nick Brown, used the NFU’s annual conference as a platform from which to allege that “animal rights activists” were obstructing the Randomised Badger Culling Trial (RBCT). The then President of the National Farmers Union, Ben Gill, claimed that threats of violence towards farmers by “badger protection societies” were comparable to the problems faced by employees of Huntingdon Life Sciences. Neither claim was verified or supported by evidence. Both were reported on *Farming Today*^{viii}.

20. The then National Federation of Badger Groups had anticipated that the tactic of linking law abiding conservation and welfare organisations to “extremists” would eventually be exploited in a political way. We had therefore taken the trouble to liaise with our partners in various police forces, to assess the extent of illegal activity.

21. As a result, contrary to the claims made by Mr Brown and Mr Gill, we were immediately able to authoritatively report that: “Our survey of police forces covering the Krebs’ experiment areas has uncovered only four convictions to date for illegal activities in relation to the cull. None of the convictions involve violence or threats of violence.

22. “Up to October 2000, in the counties of Devon and Cornwall, the police had received no reports of violence, or threats of violence. In Gloucestershire, there has been one report to the police of a researcher being threatened at night—no arrests were made. We are currently checking whether subsequent incidents have occurred and would urge editors to undertake the same checks.

23. “Up to October 2000, two warnings had been given for disorderly conduct (NOT disorderly conduct with intent) under the Public Order Act 1986. Two warnings have been given under the Trades Union and Labour Relations (Consolidation) Act 1992 for ‘besetting’. In one alleged incident of aggravated trespass two arrests were made but no prosecution resulted.

24. “Up to October 2000, there had been only two recorded incidents of criminal damage to a small number of traps in the west Cornwall triplet.

25. “In October 2000, Devon and Cornwall police told us that, since 17 June 2000, there had been ten calls made to the operational team overseeing the policing of the trial. Of those, two were from protestors informing them of peaceful demonstrations and one was from a member of the public reporting a possible trespass by persons unknown. There were no reports of threats in general, no calls from farmers reporting threats, and no reports of threats to MAFF staff.”^{ix}

26. Since that time, Animal Welfare Minister Ben Bradshaw has advised that: “Management records indicate that 6239 traps have been damaged during the Krebs Trial. A further 1926 have been recorded as stolen/lost, but a proportion of these have subsequently been recovered.”^x

27. The Badger Trust has not had the opportunity to undertake a repeat survey of the police. We note that Mr Bradshaw did not cite evidence of threats or intimidation, despite being invited to do so. The Badger Trust therefore encourages the Committee to make a clear distinction, when it comes to allegations of threats to farmers, between scare-mongering and fact.

28. In addition, we draw the Committee’s attention to an article in the *The Cornishman* on 18 December 2003. It was kindly sent to us by the West Cornwall Badger Group, for reference. It quotes a grandmother from Zennor, Pip Macfarlane:

29. “People of all ages from all walks of life have been out there looking for traps and doing their bit to save our badgers. I’ve seen people with walking sticks carrying bolt-cutters out across the moors—people feel so strongly about this. The reaction of local folk has been fantastic. There are still some live setts, which is very good news—I just hope Defra go away and don’t come back.”^{xi}

30. The Badger Trust does not condone the illegal activity that is referred to. Nor can we comment on the veracity of the claims. Nevertheless, we were struck by two comments: “people of all ages from all walks of life” and “our badgers”. The implication is that opposition to culling—both in practice and in principle—does not come solely from “extremists”, but also from many perfectly ordinary, mild-mannered people who see the extermination as an assault on something to which they attribute property rights. In economic parlance, badgers have an “existence value”.

31. Of course, farmers also attribute property rights to their livestock. But there is a key difference. The public subsidises the livestock industry to the tune of £1.3 billion per annum. The public has bought the right to have a say in farming.

32. Many of the farmers demanding badger culling will also be applying for Higher Level Scheme funding from Environmental Stewardship: payments to “care for” wildlife and the environment. A further question that could be included in the Government’s consultation, therefore, is: “How much can farmers reasonably demand from the public?” The Badger Trust believes that the public is generally supportive of farmers and farming, but not at any price.

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Written evidence

Memorandum submitted by The Family Farmers' Association (Formerly The Small Farmers' Association) (BTB 01)

COMMENTS ON DEFRA'S CONSULTATION DOCUMENT "CONTROLLING THE SPREAD OF BOVINE TUBERCULOSIS IN CATTLE IN HIGH INCIDENCE AREAS IN ENGLAND: BADGER CULLING"

1. This paper asks a lot of questions, many of which are too technical for an ordinary person to answer. The main question: "Should badgers be culled?" merits a resounding "Yes". The government has now accepted that it may be necessary to cull badgers if TB is to be controlled. This was more or less accepted in 1997 and as a result the Randomised Badger Culling Trial was started. Eight years later, only partly as a result of the RBCT, the government is suggesting that it might be a good idea to cull badgers in TB "hotspots".

2. It is to be hoped that this consultation paper is not the start of a long period of discussion in which there is no action taken. There is little or nothing in the paper about the enormous amount of human, not to mention cattle, misery caused by the increasing incidence of TB in cattle. The monetary cost is discussed at length in the RIA and it is plain that the cost to government is great. The cost to farmers, net of the compensation paid to them, is not made entirely clear in the paper. (Some research has indicated that some farmers have gained financially from TB. But in serious breakdowns, the cost to the farmer can also be great.)

3. The first part of the paper details the history and current situation in the long saga of badgers and TB. It concludes that there should be "a balanced approach that tackles the reservoir of infection in badgers as well as in cattle". But, the general public, as well as farmers, should be involved in determining what action to take.

4. Given that respondents agree that culling is desirable, they are asked to choose between three options as to actual method and organisation of the cull. Basically these are licensing individuals to cull, organising a cull over a large area, or a targeted cull based on affected farms. There are then a series of technical questions, such as the criteria to define farmers eligible for licences, how to choose the areas to cull, actual methods and possible training in culling procedures. There are three questions on the technique of body snares, but it seems highly unlikely that farmers will wish to try and cull their badgers by this time consuming method which is not even practicable.

5. Asking these questions may be useful. But what would be much more useful would be to talk to the farmers who already have experience of eliminating all the badgers on their farm, or otherwise reducing their numbers. There is growing anecdotal evidence that more and more farmers are taking matters into their own hands and "dealing with" their badgers. General opinion is that this results in an end to the TB problem on a farm where badgers are wholly or partially removed. Further general opinion is that if you have no TB, you should let your badgers well alone and not disturb them, so there does not seem to be any danger that this farmer action will kill badgers unnecessarily.

6. So my response to Defra was that they should declare an amnesty and find out from farmers who are clearing out their badgers just how they are doing it, and how effective it is in ending their TB breakdowns. The information could be collected quite quickly and the best methods put into use immediately. Experience could soon be gained as to the finer details of the most effective and humane methods.

7. Farmer opinion strongly endorses Defra's slight preference for gassing. It is considered to be both the most humane and the most effective. If carried out efficiently it removes complete setts without disturbing the whole of the local badger population, which can lead to spread of disease. It also uses far less man power. Some farmers have a great knowledge of badgers and their habits. If their advice can be taken, and then Defra, acting on this, can organise gassing in the most effective way, culling could, hopefully, have a dramatic effect on the bovine TB situation. It is believed that when a sett is rendered vacant by gassing, it is diseased badgers, turned out of their home setts, that will colonise the empty sett. Repeat gassing of re-used setts is thus likely to target diseased badgers.

8. The consultation paper contains some sensible suggestions. Perhaps the best is that the policy should be flexible, so that it can be adjusted as necessary. The main thing is to get started on action before bovine TB is any more widespread than it is now, more cattle are killed and more farming families driven to despair. Practice and experience will guide developing expertise in culling.

9. Two other matters are mentioned: compensation and pre-movement testing.

10. The proposal to compensate farmers for cattle compulsorily slaughtered according to a set table of valuations based on current market prices seems vicious. When an animal is forcibly removed, one should be entitled to true compensation for the value of that animal to that farming business. The market value of the animal is irrelevant, as one cannot go out and buy a replacement if there is TB in the area. In the case of home bred closed herds a bought in cow is much inferior to one raised on the premises. The consequential

loss from the loss of a young cow with its productive life before it can be great. I have not seen the actual table, but I understand that, although youngstock now have many age bands, all cows will have the same price tag—young or old, highly productive or not—which is manifestly stupid.

11. Farmers feel very bitter that government, having done absolutely nothing to solve the TB problem during the many years of the RBCT, is now imposing additional financial penalties on them. The heartache of losing cattle to TB, plus the difficulties of frequent testing, is enough to bear.

12. As for pre-movement testing, one can understand that this may help to reduce new outbreaks of TB. But the expense will fall very heavily on farmers whose income is from young animals sold for breeding or fattening. Except, perhaps, in the case of expensive pedigree cattle, these are likely to be farmers whose income is already minimal. They simply will not be able to afford the testing. Many of them will be upland farmers, who desperately need more support, not less, if only for the sake of the tourist industry, whose raw materials they care for. If the State wants an attractive landscape to encourage tourism, it will have to pay for the pre-movement testing.

January 2006

Memorandum submitted by T Meeuwissen and M Gwynn (BTB 03)

1. In response to your press notice on Bovine TB and badger culling, it is outrageous that the NFU refused to take part in the pre-movement testing of cattle unless they got a mass badger cull. The farmers have blackmailed the Government into taking the most appalling and pointless measures.

2. From the ranks of the NFU come those who brought us mad cow disease, factory farming (pigs unable to turn round in their tiny cages), the poisoned sheep dip disaster, huge declines in our bird and butterfly population as a result of chemical sprays, an increase in botulism due to the spreading on land of poultry manure and carcasses, GM crops, the list goes on. Today we have illegal fox and stag hunts reported in Devon and elsewhere.

3. Yet we are expected to believe farmers' fantastic claims that up to 96% of all bovine TB is due to badgers, and it looks like we are in for another sickening slaughter of one of our most endearing and cleanest mammals.

4. Imagine a country where badgers are farmed—for their skins, their flesh, for shaving brushes—and where cattle roam wild in the woods and fields. Would not the farmers then blame the cows for giving TB to their valuable badger livestock, and be calling for a massive cattle cull? (In this instance they would be right, since badgers root under infected cow pats for dung beetle larvae).

5. If TB in badgers is so rife, why are they not wiping themselves out? We live on the edge of a Cotswold wood and feed our badgers nightly, by hand. Occasionally one will have a torn ear or a chewed tail, but these are sleek happy healthy animals with no hint of disease whatsoever.

6. After more than 30 years of study, experts at MAFF/DEFRA have been unable to show that TB spreads from badgers to cattle—it has never been proved. Cattle catch TB by inhaling sputum aerosols in the same way humans catch flu, and they catch it from each other. When TB gets into a herd it spreads—and then to the herd next door—slurry is very infectious.

7. The shy badger has been horribly baited and persecuted for centuries—one tends to forget the origin of the verb to “badger” someone. Now these beautiful, benign and very clean creatures are once again made the scapegoat. It will be a national disgrace if the culling proceeds.

January 2006

Memorandum submitted by B Hitchin (BTB 04)

Does the Consultation on the proposed badger cull as a means of controlling TB in cattle address the two issues below ?

A. SCIENTIFIC VALIDITY

B. PRACTICALITY and COST EFFECTIVENESS

A. SCIENTIFIC VALIDITY

1. The rationale for a mass badger cull relies heavily on the interim results of the KREBS/RBCT badger culling trial⁽ⁱ⁾. This found that extensive proactive culls reduced cattle TB initially by 19% whereas, just outside the badger culling area, cattle TB increased by 29% due to “perturbed” badgers emigrating outwards just as the reactive cull increased TB by 27%. This represents an impossible political nightmare—how can it make things both better and worse?

2. In FACT there are two things wrong with these views from Professor Bourne and the ISG team:

- (a) Simply too few badgers were culled to cause such an effect: out of 1,000 sq km in the 10 triplet areas, only 357 with TB and, of those, only 127 with lesions which might make them

“superexcretors” which might infect cattle, although how is unknown. Cattle need a minimum dose by ingestion of 1 million bacilli, ie a calf would need to drink three cc of badger urine with 300,000 bacilli per cc: wildly improbable!

- (b) The very detailed statistics take absolutely no account of the culling of TB reactor cattle which is the real reason TB disappears amongst cattle. Britain had a text-book cattle TB scheme into the 1970's in which cattle were removed by annual testing before they reached the infectious stage with visible lung lesions so curbing cattle-to-cattle spread. BSE then Foot and Mouth both led to relaxing of cattle testing and movement controls so allowing cattle TB to spread like wildfire. Pre and Post-movement cattle testing is essential to stop spread of TB into TB-free areas and from hot spots developing. The 30% increase of cattle infections after FMD in reactive areas was before any reactive culls happened. In addition the drop within proactive areas is simply due to least slippage in testing and a rise in cattle which has since begun to fall. These results show that cattle measures “work” but have absolutely nothing to do with culling a few badgers.

B. PRACTICALITY AND COST EFFECTIVENESS

3. Practicality is seriously in doubt. DEFRA have already ruled out gassing and cage trapping (only 30–80% effective). This leaves groups of farmers with bad herd breakdowns applying for licences to snare, with bio-security strings attached.

4. Since 57% of farmers in West Cornwall have refused culls, the chances of group licences being granted are reduced. Who will have firearms licences? Farmers say they want DEFRA to do the snaring and/or protect farmers from Animal Rights Activists. Farmer DIY culls would be illegal under the Badgers Act 1992 and contrary to the Berne Convention.

5. Badger culling might be cost effective IF 80% of herd breakdowns are due to badgers, but work in Ulster suggests the badger contribution might be 2.5% AT MOST. Each infectious badger culled under the RBCT has cost £28,000 each!

6. The NFU Council had a stormy meeting⁽ⁱⁱ⁾ and agreed NO to reduced compensation and NO to pre-movement testing unless they get a mass badger cull.

7. I put it to you, do the people of this Country want to visit a SUBSIDISED loss-making “monotonous intensive monoculture countryside” worked by tractors, OR do they want the biodiversity of conserving our wildlife/environment that would lead to Increased Environmental and Tourism opportunities?

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January 2006

Memorandum submitted by National Beef Association (BTB 05)

EXECUTIVE SUMMARY

1. An effective badger cull in core TB affected areas is at least 10 years overdue. Defra has at last recognized this but there are elements in its Bovine TB and badger culling consultation that are naïve and alarming.

2. The National Beef Association (NBA) is firmly of the view that properly organised intensive culling must be conducted over a suitably wide area and over an extended period—although it would also prefer an initial blitz with as much concentrated culling activity as possible being undertaken in all designated areas for at least the first two weeks of the approved culling period so that the culling policy has the earliest possible impact.

3. However a number of fundamental concerns relating to the depth of Defra's commitment to a demanding culling process have already emerged.

4. This is demonstrated by its apparent unhappiness in helping to prepare the industry to properly tackle the expensive and difficult problem of culling out sufficient badgers over a sufficiently wide area to prevent further spread of TB through population disturbances (perturbation) in which unsettled badgers, which have TB, wander into new areas and infect new cattle and new badgers—or by playing a full and proper part in the planning and execution of pre-established strategies after culling has begun.

5. One example of the former is its lack of urgency in approving the use of carbon monoxide gassing before the cull—which is expected to begin in June. The NBA is seriously of the view that without using this gas, which is available to large numbers of farmers through petrol engines and catches entire badger groups while they are underground during the day, it will be extremely difficult to conduct a satisfactory cull on the scale necessary to put bovine TB on the retreat and then eliminate it.

6. In the meantime Defra has said it will be impossible to approve carbon monoxide for culling in 2006 and perhaps thereafter too. In short it is saying carbon monoxide may never be a culling tool while the NBA is saying that without it a worthwhile cull over large areas of land will be much more difficult than it otherwise would be—even if large numbers of farms can be persuaded to use rifles or snares across large areas of ground for at least five years if not longer.

7. Another is its apparent wish to commit itself only minimally to the conduct of the cull. The NBA has spoken to Defra at length over the last six weeks and has formed the view that the Department is not at all enthusiastic about taking a lead position in helping to organise, co-ordinate or part fund the cull—while it is also clear that without substantial help from Defra farmers will not, on their own, be able to sustain the organisation or momentum to cull out the huge numbers of badgers over the vast tracts of countryside over a number of years that would be necessary to achieve a satisfactory result.

8. Our impression is that Defra, which is persistently under-budgeted and under funded, would for internal resource reasons prefer the cull to be conducted almost entirely by farmer volunteers, or their paid assistants, and the co-ordination of their activity to be conducted by organisations of relatively slim means, like the National Farmers Union (NFU), working with the help of groups like ourselves.

9. The NBA, NFU and others may be enthusiastic about, at last, being able to tackle a badger cull but they are not government and there are severe limitations on the resource they can offer and the likely effectiveness of activity they are able to co-ordinate.

10. The NBA's very clear view is that the culling of badgers must be organised with a similar thoroughness and resolve as other difficult anti-disease tasks such as the elimination of FMD—although of course an anti-TB campaign would be conducted on a smaller overall scale.

11. We see a specially designated operations rooms being set up in each county in which culling will take place. Cornwall, Devon, Somerset, Gloucestershire, Herefordshire, Worcestershire, Derbyshire and Staffordshire are among those that would be included.

12. These rooms would be permanently manned and staff would have telephones and computers, contact lists, maps and clear strategy targets. Strategies would be coordinated with the help of staff from Defra's own Wildlife Unit (more on this later), farmers and landowners, members of National Gamekeepers Organisation (NGO) representatives from the local fox hunt and the National Wildlife Trust—each of whom would be able to help in identifying setts. At least one full time member of staff would be familiar with officials in Defra's TB department in Page Street.

13. A county stakeholder group made up of representatives of these organisations would meet regularly fix and monitor its overall strategy and then discuss whether current culling targets have been achieved and re-arrange the programme if culling in some locations has fallen behind.

14. This would require direct Defra input at both local and national level. Other participants would offer their services without charge, as they did during FMD, but Defra would also have to meet the cost of the room, the staff, and the management. If necessary logistics and planning specialists from other areas of government, perhaps the army, could be called in to help. Such activity may be necessary for 10 years.

15. Unfortunately Defra currently gives the impression that it is reluctant to accept these arguments and appears more concerned about saving what it can of its £7 million annual expenditure on its Wildlife Unit by dispensing with the services of men it employed during the Random Badger Culling Trials (RBCT or Krebs) to trap badgers, and who know exactly where the setts are, than recognising that if TB costs compound at 20% a year they will double every four years.

16. This means that if TB spread is not checked taxpayers will face a £2 billion TB bill over the next 10 years (Defra accepts this figure). The NBA finds it hard to believe that in view of this Defra, and others in government, are not prepared to invest substantial forward sums so they can save as much as possible of this huge cost burden

17. Our question to decision makers in Defra, and therefore government is—how much are you prepared to invest in effective badger culling to avoid inflicting tax payers with an avoidable £2 billion bill in 2016? A supplementary question would be—does Defra not think it will be impossible to save taxpayers £2 billion if carbon monoxide is not approved for culling badgers from June 2006 and culling has to be conducted by rifle or snare alone?

THE NEED TO CULL OVER LARGE AREAS

18. The NBA is aware of the arguments against small scale, pocketbook, culling. These are commonly cited by the Independent Scientific Group (ISG) which at one stage abandoned a section of the Random Badger Culling Trials (RBCT) because it was convinced that the disturbance (perturbation) culling created added to TB spread because more infected badgers were being pushed beyond their territorial boundaries and coming into contact with cattle which up until then had not been exposed to the disease.

19. The ISG repeated these arguments in the interim report which informed the consultation paper Defra issued on 15 December. After studying the ISG report the NBA found it impossible not to conclude that a badger cull, should one be adopted, would have to be conducted on a scale not previously envisaged if it was to be successful.

20. That being said the NBA also noted that culling (conducted by trapping) within the RBCT areas was far from efficient and concluded that if the culling there had been more well-organised fewer surviving badgers would have been disturbed by incomplete culling activity, because their family unit structures had been broken up, and a smaller number of infected badgers would have been able to move beyond the cull boundaries and raise the level of TB in cattle in those areas.

21. Inevitably this persuades us that all culling, including that in large areas, must be efficient with as many badgers as possible removed.

22. We note the contents of the ISG letter of 20 January in which it says that only intensive culling over a large area over an extended period will be effective. Significantly it suggests that culling in target areas of only 100 sq kms or so must be avoided while anything over 300 sq kms would help to curb TB spread and reduce TB infection rates, and costs, in cattle—as long as it is done properly.

23. This observation fits in with our own view that culling must be conducted over the widest possible area and we consider that when measuring out 300 sq km sections in the worst affected TB regions there will be many occasions when these overlap to form much larger regions perhaps accounting for a significant proportion of an entire county—if not entire counties in the case of Cornwall, Devon and Herefordshire.

24. It is also important when conducting a cull to establish a boundary so that the number of badgers culled is kept to the lowest possible levels. Such boundaries will be where badgers without TB exist so it makes sense if culling embraces all areas where TB in badgers is endemic but does not move into areas where badgers can be proved, by polymerase chain reactor (PCR) analysis if necessary, to be free from TB.

THE CULLING TOOL BOX

25. All culling will require cullers to be adequately equipped and the need for this will be even greater in the biggest culling areas.

26. Unfortunately Defra appears to think that huge numbers of badgers over vast tracts of countryside can be removed using body snares and guns.

27. The NBA is not persuaded. Each of these is a method that could be used effectively in small, specific, areas but neither could adequately cover the wide areas we envisage because each is time hungry. One requires the regular re-visiting of snares in daytime the other the work of at least two people (the lamper and the shooter) at night.

28. On the other hand carbon monoxide gas is a tool which lends itself to general widespread use. Gas pumped in from portable petrol engines or petrol driven quad bikes could be put through many badger setts relatively easily by a single person—and also has the advantage of targeting several badgers, indeed entire groups, at the same time. It is easily the most efficient method and vital it is confirmed as permanent tool in the culler's kit.

29. Unfortunately Defra says it will not be able to satisfy anti-cull lobbyists that carbon monoxide (exhaust gas) is humane by the time culling is expected to start in June. Its main objection appears to be that some badgers, perhaps unweaned cubs, lying in elevated areas of the underground tunnel system will survive the gas.

30. The NBA has read the information on this provided by Defra on its website and has concluded that on the rare occasions that a badger survives monoxide poisoning it does so with no permanent ill effects—except perhaps for a headache that soon disappears.

31. We cannot stress how important carbon monoxide is to the conduct of an effective cull or how slender the arguments against using it appear to be. We would like Defra Ministers to overrule officials on this extremely important issue. Gassing with carbon monoxide in day time backed with rifle and spotlight (lamping) action at night have a real chance of being effective while each activity on its own would be significantly less useful.

THE CULLING CLOSE-SEASON

32. If carbon monoxide gas is used we see no reason why there should be a closed season. This is currently in place to prevent unweaned cubs starving if their dam dies above ground.

33. Carbon monoxide (exhaust gas) would kill both dam and cubs underground and so could be used without a closed season. It does seem strange to us that animals breeding within a targeted culling area are offered the chance to continue breeding and add to the task of achieving a full and effective cull.

34. We would accept that snaring and shooting be abandoned over the suckling period but urge that carbon monoxide control should be encouraged in January–February when many livestock farmers are free of the burdensome seasonal tasks they face in spring, summer and autumn.

CULLING STRATEGIES AND CO-ORDINATION

35. The NBA favours the adoption of a concentrated culling blitz in the first two weeks of the culling period and for two weeks each year thereafter.

36. Such action would be especially effective in areas where snaring and shooting were the dominant culling methods because badgers wandering off one farm onto another would be more likely to be caught or killed.

37. Our opinions on how culling should be organized on an overall basis are contained in the executive summary.

USING POLYMERASE CHAIN REACTORS (PCR) TO DEFINE THE PERTURBATION LINE

39. The NBA has investigated the use of PCR machines in identifying the location of diseased and disease free badger setts and late last month introduced two Defra officials to the machine.

40. Our view is that even if culling areas are on occasions as large as individual counties, as seems likely, there has to be a properly defined point at which the culling ends so no more badgers are killed than is necessary but TB is eliminated in the area where it is endemic.

41. We do not propose that a PCR assay, which can be done on site, by the sett, within 15 minutes, using badger faeces, is conducted in the centre of the core culling areas but believe it must be used to define the perimeter of the culling area and indicate the point beyond which no more culling is necessary.

42. Amongst ourselves we are calling this the perturbation line and believe an effort must be made to see whether such a definitive line can be established using information on TB outbreaks in cattle to establish exactly where these sentinel animals are confirming TB among resident badgers—and then extending outwards from that line, perhaps by 10–12 kilometers, to determine, by means of PCR assay, exactly where a line can be drawn that indicates badgers on one side are carrying TB but those on the other do not. These lines could be monitored on a regular basis to see if they have moved.

CONCLUSION

43. The NBA is disturbed by the apparent naivety of Defra's thoughts on badger culling and is also worried about whether or not the Department is genuinely determined to maintain its important contribution to a national effort to reduce TB in GB over the next 10 years.

44. We are not yet sufficiently well informed to be exactly sure where Defra stands on the culling issue. However we have the very real impression it has spent so long diverting farmers' attention away from discussion on badger culling that now the need to offer constructive thoughts on the conduct of an effective badger cull has been thrust upon it is shown to be woefully short of useful ideas.

45. This would certainly explain why it appears to think an effective cull can, and should be, organized (and largely paid for) by farmers while we are already certain that an effective cull requires long term government assistance with manpower, planning and funding.

46. The NBA is looking for confirmation from Defra that it recognizes the scale of the task ahead and the need for its help and commitment. We see more serious examination of the need to include carbon monoxide in this summer's culling tool box as proof of its realization that it simply cannot, after 10 years of saying no, simply lob the culling ball at the farming body and tell it to get on with it.

47. However there may be more sinister reasons for Defra's lack of interest. It may think that by opening the way for a few farmers to relieve their TB frustrations to have a pot shot at a few badgers it will more easily persuade the farming lobby to accept the cost of cattle pre-movement testing in heavily infected TB areas.

48. We would certainly hope this is not the case, especially as the perturbation such disorganised activity would create would compound the TB problem, and look forward to being reassured that such thinking is wrong.

49. Nevertheless it is abundantly clear that Defra does not appear to fully appreciate the responsibility thrust upon it through bovine TB being a notifiable disease—not least because it is a zoonosis with the potential to damage human beings who have contracted it through cattle and milk—or more likely these days from diseased badgers either directly or through their contact with household pets.

50. Our understanding is that Defra is required by law to control and then eliminate bovine TB in GB—which it has manifestly failed to do—and that it is under genuine pressure from the European Commission introduce more urgency into its anti-TB activity now that the disease is doubling in intensity every four years and therefore posing an even greater risk to human and animal health.

51. The NBA itself is astonished that Defra does not yet appear to be ready to invest in reducing the anticipated cost of further TB spread, estimated at £2 billion over the next 10 years unless effective action is taken, by working with industry in establishing the framework for a planned attack on TB through the organized culling of large numbers of badgers, across vast tracts of countryside over a considerable period of time.

January 2006

Memorandum submitted by Farmers' Union of Wales (BTB 06)

1. EXECUTIVE SUMMARY

Due to the lack of significant geographical boundaries along large lengths of the England-Wales border, and the trade that takes place between the two countries, the prevalence of TB in England has a significant effect on the situation in Wales, as do policies instigated in England. Any policies adopted by DEFRA in England are therefore of direct consequence for Welsh farmers and the FUW, and often lay the foundation for policies later adopted in Wales.

The FUW firmly believes that bovine TB cannot be controlled unless badger removal occurs in and around areas where TB is a problem. Such action can be justified on the following grounds:

1.1 TB annually results in the deaths of tens of thousands of cattle, badgers, and deer. In the case of cattle, the welfare implications are generally negligible due to early diagnosis and slaughter, but the economic and social effects are dire. In the case of deer and badgers, the deaths caused by the advanced stages of TB are agonising. The current epidemic must therefore be controlled on welfare, social, and economic grounds; to allow TB to continue to spread would only add to the human and animal suffering that TB causes.

1.2 Scientific evidence from around the globe, not least from the recent Irish Four Area and English Randomised Badger Culling trials, indicates that the removal of wildlife reservoirs is an essential part of TB control.

1.3 The cattle controls currently in place are based upon principles that have, in the absence of, or effective action against, a wildlife reservoir previously been proven to be effective in the UK.

1.4 The badger is not endangered in any way, and removing badgers from TB affected areas would have no significant affect on the predominance of the species in the UK. In fact, it seems likely that badger removal could leave the number of badgers in the UK at a higher level than in 1997, when the Krebs report stated that "*Badger removal operations are not a threat to overall badger numbers*"¹

1.5 It is the belief of the FUW that the current objections amongst some regarding badger culling are not based upon an objective analysis of the scientific evidence regarding TB and the welfare and abundance of badgers, but on the perception that badgers somehow occupy a higher status in the animal kingdom than others, and should be protected at all costs.

2. BACKGROUND

2.1 Since 1996 the number of cattle compulsorily slaughtered in the UK due to bovine TB has risen by some 700% since, from 3,752 in 1996 to 29,585 in 2005. The number of cattle compulsorily slaughtered in 1986 was 638, around 2% of the current figure.

2.2 In 1980, the Zuckerman enquiry into TB was conducted against a background where 28 new herds had tested positive in Great Britain. In the year of the Dunnet TB enquiry, 1986, there were 32 herd breakdowns. In 2005 the total number of new herd TB incidents was 3,514.

2.3 The current level of TB is higher than it has been for many decades; in 2005 3.9% of herds were confirmed as new herd TB incidents, whereas in 1962 the proportion of total herds with reactors was less than 1.5%. There is now significant concern that the European Union and the wider world will impose further severe restrictions on the exportation of British meat and dairy products due to the TB crisis, and that such action would not only add to the current problems facing the rural economy, but would also be severely detrimental to the image of Britain at a time when the massive efforts made to restore Britain's image in the wake of the BSE and FMD crises are coming to fruition.

¹ Bovine Tuberculosis in Cattle and Badgers, Report to The Rt Hon Dr Jack Cunningham MP by Professor John R Krebs FRS and the Independent Scientific Review Group, 1997.

2.4 While there has been in place a compensatory system for those farmers who lose animals as a result of TB, that system does not take into consideration either the total losses experienced by farms, or the emotional impact TB has on farming communities. The current TB crisis is therefore not only of serious concern to the FUW because of the economic effects, but also due to the social and emotional impact it is having on communities and families.

2.5 In May 2005 the University of Exeter reported that the value of cattle slaughtered was 66% of the total cost of a breakdown on a beef farm and 65% of that on a dairy farm, and that the emotional effects led to severe stresses on communities and families². The report concluded that:

“... there is little disagreement that the total cost of a TB incident generally exceeds payments for the livestock slaughtered... there are significant economic impacts which typically have to be borne by the farm business concerned...”

“An outbreak of bovine TB can have a serious effect on the farm business concerned and movement restrictions, sometimes for extended periods, can make the impact much worse than that of an outbreak of FMD. It is the longer lasting effects which are the source of most of the damage done to the farming industry by bovine TB. Where they apply... they typically result in significant consequential effects on the economic performance and growth of the farm business, and not infrequently are associated with serious stress affecting at least some of the farmer, the farm family and the farm staff”.

2.6 Prior to 1973, farmers routinely controlled badgers, just as any other pest, were badgers caused excessive damage in terms of crop or pasture damage, lamb losses, etc. A significant proportion of such control was carried out using firearms. Since 1973 successive pieces of legislation, primarily designed to prevent the abhorrent practice of badger baiting, have had the effect of reducing the humane control of badgers, thus allowing badger densities and numbers to increase without control, probably for the first time in Britain's history.

2.7 In 1997, Professor Stephen Harris of Bristol University concluded that, during the previous decade, the number of annex setts in the UK had increased by 87%, subsidiary setts by 54%, and outlying setts by 55%, whereas the number of disused setts had declined by 41%. The experience of our members has been of a continuing rise in badger numbers since Professor Harris' survey.

2.8 The significant increase in badger numbers during the last 30 years is indisputable, and we are not aware of any bodies who do not accept that such growth has occurred.

2.9 There is now significant anecdotal and scientific evidence that the increase in badger numbers has resulted in the decline of the hedgehog, due to predation. The Mammals Trust recently reported a 20% decline in hedgehog numbers over the last four years, while in 2004 Defra funded researcher Richard Young told the European Hedgehog Research Group that:³

“Surveys revealed negative correlations between badger density and hedgehog abundance, predicting that badgers can achieve sufficiently high densities to exclude hedgehogs from rural habitats”

and that

“... these results, combined with information from previous research, show that high badger density can have a major impact on hedgehogs in rural and even suburban habitats”.

2.10 The findings of Dr Young are perfectly in line with the observations of FUW members that badger and hedgehog abundances are inversely linked, and that the proliferation of badgers has led to hedgehogs becoming an extremely rare sight.

2.11 Many of our members have expressed concern that, just as it took many decades for the elimination of red squirrels by greys to become recognised by Government, the hedgehog may similarly be in danger of becoming extremely rare due to the growth in badger numbers.

3. TB CONTROLS

3.1 It is well established that disease risks and the propensity for wildlife reservoirs to become established are a positive function of population densities and numbers. The badger population and density growth has naturally exacerbated the potential for TB wildlife reservoirs to become established.

3.2 Since 1986, badger control measures in response to TB incidents have gradually been stepped down, and were finally abandoned in 1996. The gradual reduction in badger control in diseased areas has been accompanied by an exponential rise in the number of cattle culled due to TB (Appendix I). The number of cattle compulsorily slaughtered in 2005 due to TB was 29,585, 28% more than in 2004.

3.3 The Farmers' Union of Wales have long recognised the importance of controlling bovine tuberculosis (bTB) in all significant species, those species being cattle, badgers, and deer.

² Sheppard, A, Turner, M, *An Economic Impact Assessment of Bovine Tuberculosis in South West England*, Centre for Rural Research, University of Exeter, 25 May 2005.

³ *The effect of Badgers on hedgehog abundance and distribution*, Richard Young, Central Science Laboratory, Woodchester Park Research Station, *Proceedings of the 6th International Meeting of the European Hedgehog Research Group, April 2004*.

3.4 Previously successful TB control policies have either involved the testing and culling of cattle in the absence of a significant wildlife reservoir (ie when badger densities were significantly lower than at present), or have been accompanied by the efficient removal of wildlife susceptible to TB (such as occurred during the 1970s and 1980s)

3.5 While some individuals and organisations continue to claim that the role of badgers in TB transmission is not relevant, the conclusions of both the RBC and Irish Four Areas trials demonstrate beyond doubt that badgers play a major role in the transmission of TB.

3.6 The perturbation effect that occurred in areas surrounding the RBCT areas demonstrates beyond doubt the significance of the role that badgers play in transmitting TB; if badgers were not a significant factor, then perturbation would not have occurred.

3.7 While the FUW have no objection to the principle of using trapping as a method of badger control, it is our belief that the inherent inefficiencies of trapping and the disruption that pre-baiting and then setting traps causes to badger populations made a significant contribution to perturbation.

3.8 The FUW does not believe that trapping is in any way more humane than other possible methods of badger control, and that it has traditionally been used simply for cosmetic reasons, rather than any real benefits in terms of animal welfare.

3.9 As well as being remarkably inefficient, trapping and then killing badgers is also phenomenally expensive, with estimated costs per animal culled varying between £700 and £4,000.

3.10 As confirmed by the RBC and Irish Four Areas trials, affects of all major TB vectors must be minimised if the disease is to be controlled. Those vectors are, beyond doubt:

- (a) Cattle to cattle.
- (b) Cattle to badgers.
- (c) Badgers to badgers.
- (d) Badgers to cattle.

3.11 Notwithstanding actions taken in the RBCT areas, during the last 10 years only vectors (a) and (b) have been addressed by the Government. It is therefore not surprising that TB has increased at such a dramatic rate.

3.12 Given the widely accepted significant increase in the badger population, it is the view of the FUW that necessary culling in regions affected by TB would have an insignificant affect on the UK badger population as a whole, and it is not unlikely that the total number of badgers left after such a cull would be higher than the number 10 years ago, when the Krebs Report clarified that culling would not in any way endanger the species¹.

3.13 Since a cull would not have a significant impact on the UK badger population as a whole, and would certainly not endanger the species in any way, the FUW is firmly of the opinion that the iconic nature of badgers severely impedes the abilities of some to make objectively analyses of the scientific evidence relating to badgers and TB. For example, despite the fact that badgers outnumber deer many-fold in Wales, we are unaware of any significant objections being made to the control of deer for disease control purposes. In fact, Defra are actively encouraging deer control. Similarly, Biodiversity Minister Jim Knight recently stated in relation to grey squirrels that "*we must control them effectively now or there will be serious consequences*".

3.14 The FUW is concerned that what we have already described as the abhorrent practice of badger baiting has disproportionately influenced the totally separate issue of pest control by acceptable humane means.

3.15 Despite the widely accepted increase in badger numbers, there exists an influential perception amongst members of the general public that badgers are rare. This can primarily be attributed to the large proportion of people living in urban environments and the nocturnal nature of the badger. Nevertheless, recent DEFRA funded research conducted by Reading University revealed that 71% of the general public though wildlife management was sometimes necessary, and 51% thought that there could be fewer badgers as long as they did not become endangered.

3.16 Members of the FUW who routinely controlled badgers prior to the 1973 Badger Protection Act can confirm that badger control with rifles can be a highly efficient and humane method of control. Allowing such a method to be practiced has been one of the policies advocated by the FUW as a method of controlling the wildlife reservoir.

3.17 The Government have advocated the use of rifles as a humane way of controlling both deer and foxes; species that make far more difficult targets for marksmen than badgers.

4. THE FUW POSITION REGARDING CULLING

4.1 The FUW accepts the view recently put forward by the Independent Science Group⁴ (ISG) that systematic and prolonged culling extending to large areas could be expected to have an overall positive impact on cattle and herd breakdown rates. It is worth noting that the 300 km² figure referred to by the ISG would, in simplistic terms, represent circular areas with radii in the region of only six miles.

⁴ ISG Letter to stakeholders, 23 January 2006.

4.2 However, it is our understanding that the views of the ISG are based upon culling being carried out using the trapping method used in RBC trial areas. For the reasons already given above, it seems likely that perturbation effects could be reduced by using more efficient and less disruptive culling methods.

4.3 Despite the 300 km² area quoted by the ISG, it is the view of the FUW that the area over which culling action could be carried out in a way that minimises perturbation effects could be far less than 300 km² in smaller areas where TB is a problem. For example, if a TB wildlife reservoir exists in an area just one mile in diameter, we would anticipate that culling over a three mile diameter would drastically reduce perturbation effects.

4.4 We therefore believe that systematic and prolonged culling should take place in “buffer-zones” that surround TB affected areas, as well as within those areas, in order to minimise perturbation effects.

4.5 In terms of the methods of culling, the FUW believes that, in order to minimise costs and maximise effectiveness, no suitable method should be excluded. Suitable methods include shooting, snaring, and gassing using cyanide gas or carbon monoxide. For the reasons already given above, trapping should be avoided unless all other methods are deemed impractical.

4.6 Farmers and their agents, gamekeepers, etc., within TB affected areas and buffer-zones should be licensed and encouraged to contribute to culling in selected areas, while ensuring that all culled animals are recorded and collected for testing. However, the Government must also play a role in tackling the disease reservoir, particularly given that the Government’s abandonment of all action against the wildlife reservoir has directly resulted in the proliferation of TB.

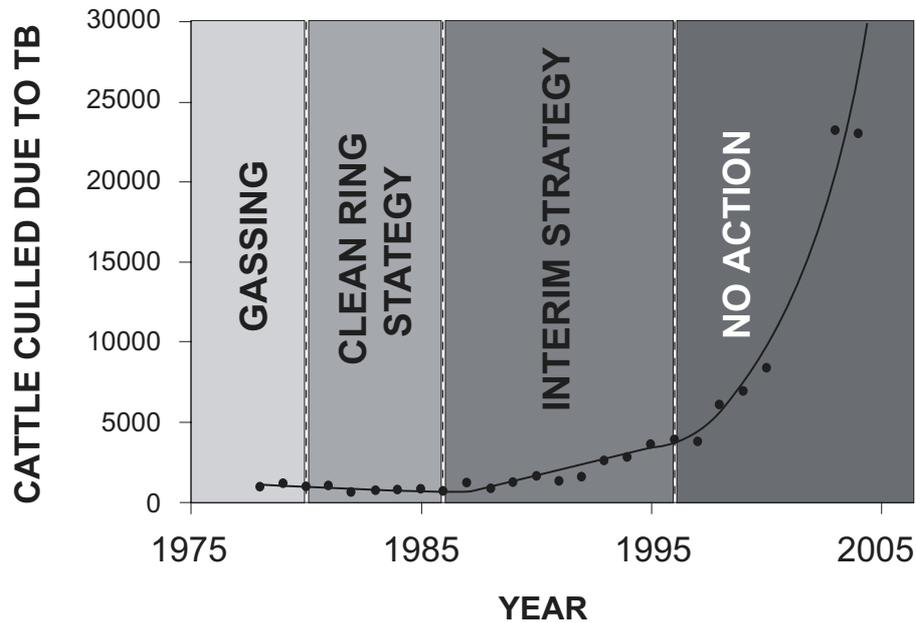
4.7 Ministry staff should therefore be employed in targeted areas where farmers are either unwilling or unable to take appropriate action to control badgers. For example, where necessary, Ministry employees or agents should be employed to lamp badgers, lay snares, and gas setts in targeted areas.

4.8 The very nature of TB means that actions to reduce the wildlife reservoir should be carried out over a period of five to 10 years; a one-off cull would not be effective, and is likely to lead to the re-infection of wildlife and problems such as perturbation.

4.9 Action must also be taken to control badgers in areas where TB incidents are low, but wildlife is suspected to be the source of a problem; for example, where a TB positive RTA badger has been picked up in a four year testing parish, or where a single farm in a four year testing parish suffers breakdown that are suspected to be linked to badgers.

4.10 Given the disruption caused in RBCT areas by animal rights extremists (for example, the large proportion of traps stolen), and the violent and destructive nature of some individuals involved in animal rights activities, it is essential that the relevant authorities protect the identities of all those involved in a cull, while taking a robust attitude towards deterring, dealing with, and prosecuting such extremists.

January 2006

APPENDIX I**CATTLE SLAUGHTERED ANNUALLY DUE TO TB BETWEEN 1975 AND 2004**

Memorandum Submitted by A Johnson (BTB 07)

SUMMARY

1.1 Should badgers be culled?

No

1.2 From our experience, we are convinced badgers are being demonised to divert attention away from:

- Inadequate TB testing regime
- Other vectors
- Inappropriate cattle management

1.3 Content of following pages

2. Introduction
 - 2.1 Our farm holding
 - 2.2 Our beef suckler experience
 - 2.3 Do focus on cattle, not wildlife
3. TB Testing Regime
 - 3.1 Outdated TB cattle test
 - 3.2 Success post WW2
 - 3.3 Overdue testing in 1970's to 1990's
 - 3.4 Avoidance of movement restrictions
 - 3.5 Other loopholes
 - 3.6 No pre-movement testing after FMD
 - 3.7 False positives give worse impression
4. Other Vectors
 - 4.1 Close human sources
 - 4.2 Movements on and off farm
 - 4.3 Brought-in feed and bedding
5. Cattle Management
 - 5.1 Intensification and stress
 - 5.2 Our cattle
 - 5.3 Exotic breed

- 5.4 Housing/yarding
- 5.5 Over-crowding
- 5.6 Stress and reduced immunity
- 6. Conclusion
 - 6.1 DO NOT blame the badger
 - 6.2 DO blame MAFF/DEFRA
 - 6.3 DO blame CAP headage payments

2. INTRODUCTION

2.1 We have been farming this land for 30 years, and joined the Dartmoor ESA scheme when it commenced in 1994. our land is all permanent pasture, virtually organic and includes species rich hay meadows, species rich wet areas and wooded pasture. It is home to mammals of all sizes from dormice to roe deer.

2.2 From the late 1970's to the early 1990's we had a beef suckler herd. At that time, this area was one of the very few remaining hotspots of bovine TB. While our neighbours had reactors, our cattle and badgers remained clear and healthy, and we successfully fought off MAFF's attempts to gas our badgers.

2.3 There have been reports that bovine TB, which we must remember is a cattle disease, has been transmitted to various other species of wildlife. So far, the vast majority of badgers have remained clear of bovine TB. So the focus should be on tackling bovine TB at source, not persecuting the victim species.

From our experience, we are convinced badgers are being victimised to divert attention away from an inadequate TB testing regime and from inappropriate changes to the management of cattle.

3. TB TESTING REGIME

3.1 It is shameful that the TB test on cattle has not been updated for 50 years or more. It is in an inexcusable time-warp.

3.2 Despite its unreliability, it was used successfully in the post WW2 decades to virtually wipe our TB from the UK's cattle population, in which TB had been endemic, without culling wildlife.

3.3 What was it that achieved such a dramatic turn-around? It was a thoroughly rigorous testing regime.

3.4 By the late 1970's, when TB in cattle was rare nationally, this part of Dartmoor was considered to be a hotspot. Cattle here were supposed to be tested annually by private veterinary practices, but MAFF had to keep reminding the vets that tests were overdue. What with some farmers making excuses to delay testing further, the interval stretched to 18 months or more. Then there was the scam practised by some farmers.

3.5 The TB test scam was easy to operate in larger batches of cattle, with a single vet outnumbered by eager helpers. On the first visit to inject the TB serum, eartag numbers were recorded as part of the concurrent brucellosis testing procedure. On the second visit to examine the results of the TB test, no eartag numbers were checked. The vet knew how many cattle had to be examined and simply counted them through. What he did not know was that before he arrived for the second visit, the farmer had conducted his own check and had decided which animals may fail the test. These he spirited away and, in the "confusion" of the vets second visit, several cattle were presented for inspection more than once. Any suspect cattle were quickly sent off to market. Has the TB test second visit been tightened up yet? I have often wondered whether the vet knew how many cattle had to be tested in the first place.

3.6 Other loopholes were excluding young cattle from the TB test, and uncoordinated testing. Particularly in an area such as this, where cattle are put out onto common grazing land, it is ludicrous to test one herd at a time instead of carrying out the testing in coordinated "waves" across the countryside.

3.7 Following the FMD slaughter in 2001, when TB testing was understandably put in abeyance, it was scandalous that pre-movement TB testing was not introduced before cattle movements resumed. This failure cannot be excused by the re-branding of MAFF into DEFRA as the TB testing personnel were not culled. Although they will have been exhausted from assisting with the FMD cull, a slightly extended standstill to allow them to recuperate would have been significantly preferable to allowing TB to be spread by the movement of large numbers of untested cattle. I understand there was a backlog of overdue TB tests prior to FMD, so the number of untested cattle was considerable.

3.8 The pathetically outdated TB test on cattle has always been notoriously unreliable. It throws up many false positives which has the unfortunate effect of making the disease seem more prevalent than it really is. A prime example happened to a neighbour recently. A pedigree bull and two cows failed the TB test and, on one of them the reaction was so pronounced that the vet said it definitely had TB. But the post-mortem examination showed none of them had TB. All that immediate and consequential disruption to the farming business for nothing.

4. OTHER VECTORS

4.1 Back in the 1980s, it was found that some TB outbreaks were due to human/stockman carriers. Why does not MAFF/DEFRA have routine TB tests done on all those people (whatever their job, professional to labourer) who have come into close contact with cattle?

4.2 What about all the other coming and goings, particularly those people and vehicles that visit farm after farm after farm: milk collections, delivery lorries, cattle transporters, agricultural contractors, etc, etc?

4.3 And what about the delivered produce that ends up in contact with the cattle—straw, hay, manufactured feedstuffs (remember the source of BSE), etc, etc?

5. CATTLE MANAGEMENT

5.1 A number of significant changes in the management of cattle have occurred concurrently with the rise in bovine TB. To start with, the size of the national herd has increased largely on the back of headage subsidies, leading to intensification and stressed livestock. And stress leads to an impaired immune system.

5.2 Our beef suckler herd, which did not succumb to the locally prevalent TB, were of a local breed attuned to the Dartmoor weather. They had the freedom to seek shelter in a modern barn, but chose to withstand even the foulest winter weather outdoors. They kept themselves well groomed; grazed on herb rich pasture in spring, summer and autumn and had free access to herb-rich silage in winter; shared their grazing with badgers from our own sett; and rarely suffered from any ailment.

5.3 Compare that with the increasing use of Continental breeds from warmer, drier climates that are not bred to withstand our climate. What is the incidence of proven TB cases in these exotic breeds compared with indigenous breeds?

5.4 Compare that also with the significant and widespread subsidised construction over the past 30–40 years, of buildings and yards in which to keep beef and dairy cattle for at least six months of the year instead of allowing them out to grass. Some pundits have promoted the extreme of nil grazing.

5.5 Compare that also with increasing numbers of cattle now being crowded together, often with inadequate bedding and getting caked with each others muck. These unsavoury conditions are so prevalent that they are not difficult to find. But to the perpetrators they are so normal and unremarkable that they remain “unseen”.

5.6 Herded together in confined spaces and in unnatural conditions, stress levels are bound to rise, and immunity to disease plummet. So it is not surprising that contagious diseases such as bovine TB are able to flourish on the average modern farm. What is the incidence of bovine TB in relation to the various degrees of housing/yarding of dairy and beef herds?

6. CONCLUSION

6.1 DO NOT blame the badger (or any other wildlife):

- It is being used to divert attention away from the true causes of the resurgence of bovine TB.
- Post-war, the widespread/endemic incidence of TB in cattle was all-but eliminated without culling wildlife.
- Badgers (and other wildlife) are a victim of this cattle disease, not the cause of it.

6.2 DO blame MAFF/DEFRA:

- For laxity and complacency in applying, and for inefficiencies in, the bovine TB testing regime.
- For not improving the TB test on cattle during the past 60 years.
- For not reintroducing the rigorous, thorough cattle testing regime that had previously been successful.
- For not introducing pre-movement testing of cattle after the FMD standstill.
- For not introducing the vaccination of untested cattle.
- For not researching and developing a test for live wildlife, instead of culling healthy animals.

6.3 Do blame the CAP headage payments:

- For the intensification and degradation of dairy and beef farming over the past 40 years.

Memorandum submitted by the Royal College of Veterinary Surgeons (BTB 08)

1. The Committee has invited views on the key questions which Ministers must address in reaching conclusions following the consultation. The Royal College of Veterinary Surgeons would suggest the following:

- can the Department for Environment, Food and Rural Affairs harness the resources and motivation of farmers in order to control TB in badgers while making sure that the net result is a reduction in the incidence of TB in cattle, not an increase?
- what methods of killing badgers would be effective and humane?

2. The Department's decision to consult on options for culling badgers as part of the strategy for controlling bovine TB is welcome. As the Select Committee knows, Ministers have in the past declined to discuss that possibility pending the completion of the Randomised Badger Culling Trial. Until recently, indeed, it was said that the results of the trial would not be reported to Ministers until next year. It is good that DEFRA have now acknowledged that it is necessary to consider ways of controlling TB in badgers, which in the present state of knowledge unfortunately implies selective culling.

3. Regrettably, the content of the consultation document and the draft regulatory impact assessment give cause for concern. Having refused, during the years of the trial, to license farmers to cull badgers in areas where there are grounds for believing that they are infecting cattle, the Department now seems to be preparing to step back and allow farmers to take the lead. It is understandable that Ministers may wish to minimise public expenditure and reduce their exposure to controversy, and it is clearly right that a major zoonotic disease of livestock such as bovine tuberculosis should be tackled by the Government, the farming industry and the veterinary profession in partnership. The Animal Health and Welfare Strategy rightly says, however, that "It is fundamental to a successful collaboration that all those involved contribute to and benefit from the partnership". There are two specific reasons why it is most important that any culling programme should be officially managed.

4. First, the Independent Scientific Group has advised with admirable clarity that culling of badgers within a designated area can help reduce the incidence of bovine TB within it but can make matters worse in neighbouring areas. It should be possible to minimise this "edge effect" by removing badgers from a large area, but the ISG has recently expressed the view that 100 sq km would not be big enough. The Group says that "systematic and prolonged culling extending to areas of 300 sq km or more could be expected to have an overall positive impact on cattle herd breakdown rates, if adequately resourced and coordinated to ensure high coverage". In the light of this advice it cannot be satisfactory for the Department to deal piecemeal with applications for culling licences from individual landowners and then leave them to their own devices. Even if all the landowners in an area of suitable size were able to agree to a co-ordinated culling programme, there would be every danger that it would break down when individuals changed their minds or did not succeed in clearing badgers from their land. The Government needs to decide on a strategy for dealing with bovine tuberculosis in a particular area—the right approach is likely to vary in different parts of the country—and make sure that it is implemented.

5. The second reason is that removing badgers is not straightforward. The Randomised Badger Culling Trial did not test the effects of 100% removal of badgers from an area, but the results in both the reactive and the proactive culling triplets suggest that the aim should be to clear the designated area and keep it clear thereafter, stopping neighbouring groups of badgers from moving in. The Trial did not, however, test how this might be done. An anonymous report of 20 October 2005 on the DEFRA website reviews current knowledge of various methods and concludes that gassing (probably with carbon monoxide), the shooting of free running badgers and some forms of snaring are worth considering. It would probably be necessary to use a combination of these methods. The report does, however, identify areas of uncertainty in relation to all of them, particularly gassing of setts (which could leave some badgers alive but damaged if it is not done properly). Further work in this area is urgently needed so that licences for the culling of badgers can specify the methods to be used, and the Department must make sure that the approved methods are applied correctly.

February 2006

Memorandum submitted by Miss D Elsey (BTB 09)

I kept horses for over 40 years and during that time I visited many farms in the north looking for hay and straw.

I saw cattle in-wintered in the most disgusting conditions—and this was at the beginning of the winter—end of September early October. A lot of them were already standing in slurry in low roofed filthy buildings and were being fed mouldy hay—I thought the "white stuff" was some sort of mineral additive until I was enlightened. Many years ago we were told that TB in humans thrived in congested living conditions and poor diet—but now we can blame badgers . . . I suspect the compensation culture encourages bad husbandry and Vets and Defra probably aren't encouraged to comment on that.

February 2006

Memorandum submitted by the Association of Meat Inspectors GB Ltd (BTB 10)

1. At the meeting held 25 January 2006 the Chairman made comment there was a possibility that if there existed a problem with the current on farm test reliability then the resulting “false negatives” could mean the incidence of TB in the national herd is higher than currently believed.

2. Members of the Association of Meat Inspectors GB report that the numbers of cattle coming forward for slaughter both detailed in documentation as contacts or from restricted areas has increased greatly over the past few years. Also that in the past two to three years some animals coming into the abattoirs both as “Clean Cattle” and “Over Thirty Months” are also displaying lesions of TB, and that this in the past would have been an extremely rare occurrence.

3. The question I asked on 25 January 2006 of the ISG was “are any animals found displaying lesions in this manner, included in the survey data, or is reliance placed only on those animals which are known as contacts or from restricted areas and so come to the abattoir with documentation?”.

4. For information the Association carried out a survey of condemnations in abattoirs during 1994–95 in 50 abattoirs. In which we looked at 192,079 cattle slaughtered of these:

Five carcasses were totally condemned for TB (0.0026%).

Four were partially condemned (0.0021%).

33 offal sets condemned (0.0172%).

38 sets of green offals (0.0198%).

5. The Association has asked both the MHS and the FSA repeatedly to follow up this survey with another, but permission has never been granted.

February 2006

Memorandum submitted by Mrs W Strickland (BTB 11)

1. Re your meeting to monitor/scrutinize the use of taxpayers money on badgers the major way currently used to control Bovine TB in the National Herd.

2. I was horrified to find the few scientists on the list are on or have been directly or indirectly involved in the cull and paid by the government/DEFRA. No independent scientist will be there to challenge these “experts”.

3. They have spent millions of taxpayers money and wasted as much again in lives of badgers/cattle to date have no proven scientific explanation to how badgers can pass TB to cattle, only statistics which we all know can be used to advantage on any subject.

4. Mr Martin Hancox and ex member of government badger panel is unpaid by anyone. He has been personally asked by Dr Debby Reynolds Chief Government Vet to attend New Stakeholder Group. He has asked to take part in your meeting and been refused. He has spent 15 years researching Bovine TB and is rightly placed to challenge the multitude of statistics to be thrown at you. A member of your committee said he will not be invited as a scientific expert on committees as it was felt to be inappropriate.

5. Why? I don't believe the statistics will stand scrutiny especially when the effect of testing and culling of cattle has been disregarded in some instances during the correlation. Annual testing and removal of affected cattle has proven to be effective in control of TB. All EU countries have stopped using badgers as scapegoats and have TB under control. Northern Ireland also reduced TB by 40% by same. TB in our herds could pose a real threat to public health and challenge our free TB status in the EU.

6. Government wanted proper scientific footing; resuming culling cannot be so Krebs Bourne have failed to clarify how badgers pass TB. Culling badgers has also done nothing to reduce TB burden in cattle. We will be breaking our own law and in conflict with Bern Convention. Culling badgers is impractical/unaffordable/unjustified. The past 35 years have been about money and political reputation. Dr Richard Meyers CBIOL/MIOL ex MAFF consultant states (MAFF) DEFRA committees cannot be independent stacked as it is with representatives of factional interests and great political clout.

7. MAFF (DEFRA) have never answered the questions how was Bovine TB virtually eliminated badgers prior to 1970 without recourse to target a single badger and why with removal of so many no eliminated or even reduced it.

8. As a taxpayer I feel the above should be answered, the last 30 years have debased the name of science, a great disservice to farmers and cheated and mislead the public.

9. Now is the time to finish completely the badger farce and return to the proven and effective methods available which would control TB and afford fair and long term proper compensation to farmers.

February 2006

Memorandum submitted by M Hancox (BTB 12)

1. I am writing to you urgently concerning your oral session next Tuesday. I wrote to you all on 21 January to enclose some preliminary information, partly as regards my 2000 submission to your Inquiry into badger TB: Appendix 15; it is still on the FMD Inquiry web <http://www.royalsoc.ac.uk/inquiry/index/> (four submissions warning FMD would exacerbate TB: it has!)

2. I also asked to be allowed to explain to you orally as a completely non-party, independent committee scrutinising the scientific validity and cost effectiveness of government policy on badger and bovine TB where the confusion lies. Having been at the ISG open meeting on the 25th, I am quite certain that next Tuesday the Usual Suspects will inform you as to the Usual Accepted Wisdoms . . . which is so spectacularly wrong that no one can seemingly “see it” . . . the same old ground re-visited.

3. It has become “accepted fact” that proactive culls reduce cattle TB 19% but via perturbed badgers increases it by 29% outside the area: Two Flaws:

A. Too few TB badgers in initial proactive cull . . . for triplets A–J

	<i>Total</i>										
Cattle TB previous year	57	70	62	187	34	14	23	36	154	215	852
Initial TB badgers	8	13	4	102	29	13	29	12	82	65	357

So, 5,100 km² areas had less than 20 TB badgers . . . and the total of 357 (only 127 with multi-lesions possibly infectious) from 1,000 km² hardly a cause anything.

B. Elliot Morley told you food and mouth “derailed the whole trial” . . . and the lack of cattle testing then huge backlog is precisely why TB has exploded exponentially many more cases reaching the more infections Visible Lesion stage. Hence from 2000 to 2002 (the 2001 gap) caused a jump from 1,044 new breakdowns to 1902; 8,000 reactors to 23,000; cost £34 million to £75 million ie double.

4. Not remotely surprising cattle TB was up to 30% in reactive areas before any culls happened . . . hence the 27% “due to culling” maybe 70 TB badgers of which 20 superexcretors . . . nothing to do with perturbed badgers at all. As I pointed out in last years Report Ev 37–44 two thirds of the 2,047 reactive badgers were culled in the last five months of the trial in 2003 so could not have had any impact on cattle TB at all. In the follow up analysis a year later there was no difference between reactive/survey areas 356–358 breakdowns.

5. As regards the proactive areas . . . seven out of the 10 had started pre-FMD (only three reactivities by contrast) so cattle controls had longer to effect the 19% drop, or 23% by later follow up cull. Outside the proactive area, cattle testing less prioritised so here slippage and the 29% rise comparable to 30% in reactive above dropping to 22% as testing resumed. The most impact of these cattle measures in inner proactive smallest area for confirmed herds 107 in 28 km², less impact 297 herds in outer 71 km², and least effect outside proactive area 307 TB herds in 97 km². Even less clear effects adding unconfirmed breakdowns to total. The 29 September report to Minister graphs show a jump in all proactive areas just after FMD. These results all show in fact that systematic testing and movement controls are what reduces cattle TB by removing large numbers of TB cattle . . . as shown above. The ISG attempts to explain the cattle effects in badger terms are farcical and indeed table, show most TB badgers have caught it from most TB cattle DIJ.

6. You have an opportunity to at last discredit the badger TB mythology. Please may I explain next Tuesday.

February 2006

Further memorandum submitted by M Hancox (BTB 12a)

EXECUTIVE SUMMARY (SECTIONS 1–7)

1. Cattle TB is now worse than in 1960 when the whole of Britain was under annual testing and movement restrictions in a textbook Area Eradication Scheme.

2. Risk to both public health and exports. With some 15% of herds in Devon/Cornwall affected, and 25% in Gloucestershire there should be a total ban on unpasteurised milk, and full availability of BCG vaccination for farmers and their families. This hotspot crisis level is already in breach of EU Directives for export, if BSE restrictions are lifted.

3. The absolute tragedy of the current crisis is that attention has focused to such an extent on badgers as the main TB reservoir over the last 30 years that no-one seems to understand how TB works in cows any longer. Fortunately, Sherlock Holmes has cast some light on the confusion surrounding the scientific rationale for a mass badger cull by exploring the following three scenarios.

4. When you have eliminated the impossible, whatever remains, however improbable must be the truth. Farmers and vets are certain that badgers are the cause of up to 96% of cattle TB herd breakdowns. There is a widespread endemic self-maintaining reservoir of badger TB and cattle testing finds sentinel cases hence locating pockets of badger TB which must be culled to prevent further herd breakdowns¹¹ See section 8.

5. The curious case of the two dogs which failed to bark in the night. As in dozens of countries worldwide which acquired bovine TB from Europe during the colonial era, cattle are the main (or sole) self-maintaining reservoir of cattle TB, which in Britain and Ireland spills over to badgers and other wildlife, and cattle tests serve to locate, control, and contain TB. Relaxing cattle testing and movement restrictions due to foot and mouth (FMD) in 2001 simply allowed TB to spread like wildfire and return to areas TB-free for 50 years. And, secondly, culling over 10,000 badgers in the Krebs/RBCT trial has made no difference to the 18% a year rise in cattle TB. See section 10.

6. It is a capital mistake to theorize before one has data. Insensibly, one begins to wish facts to suit theories, instead of theories to suit facts. Widespread proactive area badger culling decreased cattle TB by 19%, whereas localised reactive culling areas saw a 27% increase via badger perturbation, and similarly immediately outside the proactive areas an increase of 29%. See section 11.

7. Recommendations for tackling the crisis:

- (a) four, three and even two year testing intervals are too long. New hotspots may be festering eg in intensive dairying Cheshire, as happened with one or two imports resulting in over 6,000 reactors in Staffs/Derbyshire. The entire national herd should be tested annually for two years at least;
- (b) a complete ban on movement from hotspot counties (1 above) until TB is brought under control. Failing that, both pre-movement and post-movement testing (with isolation) is what stops “missed” carriers importing TB into Scotland and the north of England from becoming new hotspots. The pre-movement test from February 2006 of over 15 month old cattle will miss many younger beef stores;
- (c) with TB rising exponentially, a fundamental mistake is to de-restrict unconfirmed herds after one clear test: two clear tests from confirmed breakdowns with six month check tests for two years in Ireland (annual testing), or for five years in Michigan (rely more on abattoir surveillance and trace back)²²;
- (d) IR Inconclusive Reactors are probably TB positive if other “good” reactors in the herd, so cull at second retest as in EU guidelines, rather than at third retest³;
- (e) severe interpretation of skin test with problem herds and “dangerous contacts”²⁴;
- (f) IFN in tandem with skin test for problem herds will help remove early cases. However late TB “active spreader” VL cases have an importance out of all proportion to their numbers by exporting carriers from “TB-free” unrestricted herds: and antibody test urgently needed^{4, 17, 24}; (or see g);
- (g) PCR for rapid confirmation of *M bovis* is suspect lesions in abattoir surveillance in the National Granuloma Submission Programme in Australia⁵, similarly in Michigan. Huge numbers of bacilli shed in cattle faeces with “open” lung lesions could identify skin test anergics¹⁰, but is very unlikely to find bacilli in cattle or badger sputum. There is no evidence environmental bacilli can cause new breakdowns. Although of course huge numbers of bacilli may occur in fresh manure/slurry, so that cattle should not have access to newly contaminated pasture. And uterine discharges and perhaps urine may also add to environmental infectivity in the cowshed²⁵;
- (h) Ireland has electronic tagging from birth, a computerised database for full traceability (trace back and forwards) and “at risk” contiguous premises (via subsidy payments), and TB test history on the Blue book “cattle passport”²²; and
- (i) when cattle schemes reach low levels of TB, many breakdowns are of singleton reactors. When things go wrong however TB becomes entrenched in often big dairy herds. Depopulation was urged if 50 or even 25% of herd affected. The alternative since anergy cases are missed is being restricted for five to 10 years since BSE/FMD until the “missed source” removed amongst the 245,000 cows culled each year due to infertility, mastitis, lameness.

8. Why are farmers, vets and others so certain badgers cause up to 96% of herd TB breakdowns? There are four pivotal claims outlined in policy statements from the NFU, BVA, CLA etc^{1, 3, 11, 23}:

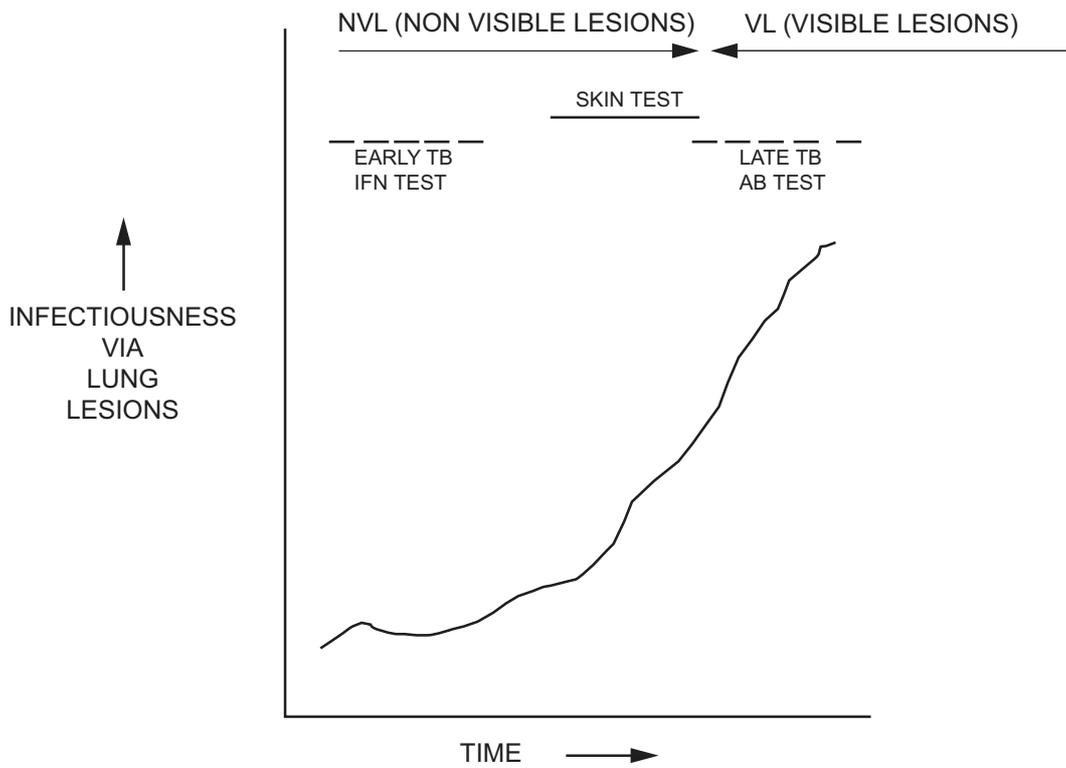
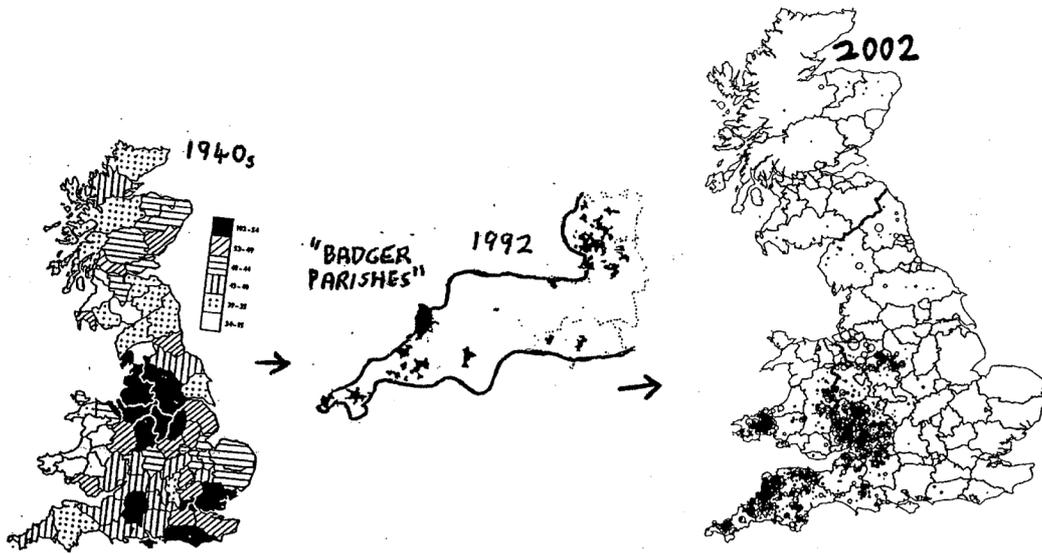
- (a) cattle-to-cattle transmission is unimportant, see section 9;
- (b) Repeat breakdowns occur in “closed” herds which have tested clear. TB badgers found afterwards, they must be the cause, see section 10;
- (c) culls work in reducing cattle TB Thornbury, Offaly, Four Areas trial, see section 12; and
- (d) it is hence entirely logical to regard badgers as the main self-maintaining endemic long-lived social reservoir of TB with ONE-WAY spillover to cattle, and other wildlife, pig, sheep, alpaca, llama, cats and dogs.

9. TB Transmission. John Gallagher ex-MAFF vet was involved with the “first” TB badger 1971, Thornbury, and Zuckerman. (In fact the first wild TB badgers Switzerland 1950’s were a spillover from roe deer carrion at the tail end of their cattle TB scheme, others now known Spain and Italy, zoo ones from 1930s London plus Whipsnade in 1950s.) He claims that here is a fundamental difference between TB lesions in badger lungs, kidneys, etc with huge numbers of bacilli making them very infectious in contrast to few bacilli in cattle lung lesions. In the 1970’s he found only 21 VL (Visible Lesion) “Open” cases amongst 1,000 reactors so concluded that such cases were so rare that cattle are of little importance in passing TB to other

cattle of badgers^{11,32}. Rather awkwardly, at Woodchester Park even with badgers “hooching bacteria” in sputum in the clan, and close contact in sleeping huddles underground, there is very little evidence of spread within the badger group, let alone to cattle!

Cattle “Consumption”: Badger “Scrofula”. Rather ironically the *M bovis* genome is smaller than the human *M tuberculosis* one, so cattle must have got TB originally from man. And just as in man “Consumption or phthisis” is a respiratory lung infection, a progressive bronchopneumonia in up to 95% of cattle¹⁰. And just as the aerosol breathed out from a passer-by with a mild cold snuffle won’t give you a cold, spending hours in an office with someone coughing and sneezing flu bugs is high risk, so too prolonged exposure is needed to catch TB. Some 130 hours of shared classes in one school outbreak, or several months over-wintering in barns with poor ventilation is ideal to spread TB and other pneumonias amongst cattle (viral, bacterial, mycoplasmal). However, a “superexcretor” patient may infect most contacts, even on a brief plane journey, and a cow with advanced TB may shed 38 million bacilli per day so even brief exposure at agricultural shows or auctions may pass TB back into “closed” herds. TB taken back to Guernsey, and in Germany. Little spread outdoors, cattle often get TB when they first enter the cowshed and breeding herd¹⁰. Only the smallest aerosol droplets can stay airborne and reach the inner-most alveoli so avoiding the muco-ciliary escalator on inhalation. The pivotal claim that only “open” visible lesion lung cases are infectious is simply wrong. If lesions occur in the draining pulmonary lymph nodes then if sought for diligently enough there will be lung tubercles, and all such cases are potentially infectious: up to 20% sputum positive²⁰. As in man though lung lesions may occur in up to 10% of cases without any in the lymph nodes suggesting TB was acquired by ingestion with secondary spread to the lungs. And so just as humans used to catch dietary “Scrofula” via unpasteurised milk, with swollen neck lymph nodes, so badger TB often starts in the submandibular lymph nodes under the tongue.¹³ The famous “Link” is that badgers have been catching TB from point source cow pats seeking worms and Dor beetles all along. A fact re-discovered with the most TB badgers linked to the most previous TB cattle (see Table below for DIJ, 30). Up to 85% of badgers with TB at the epicentre of TB herd foci in the clean ring strategy. Cattle may catch TB by ingestion but need a minimum dose of 1 million bacilli, ie 3cc of badger urine with 300,000 bacilli/cc drunk which seems rather improbable! Late TB cases may be infectious via the udder, uterus, or testes with spread at mating and a risk from hire bulls, but such “reproductive” transmission amounts to under 1% of cases. Few reach late TB stage.

10. Area Eradication Scheme. A critical review of TB schemes¹⁴ found that Britain and Ireland had textbook schemes which nearly eradicated TB by the 1970s^{10, 15, 19, 24-27, 30}. Initial tiny microscopic or Non Visible Lesion (NVL) lung cases shed few bacilli intermittently, but as many larger lesions develop and approach the Visible Lesion (VL) stage at abattoir inspection (or human lung X-ray) shedding becomes continuous with up to 38 million per day. Annual testing removes most cases before they reach the more infectious stage (SEE GRAPH).



And working from low to higher TB-level “manageable” regions, areas were gradually cleared reducing TB from countrywide to tiny southwest hotspots by the 1970—early 1990s (SEE MAPS). NB This low point was achieved without any badger culls whatsoever, and the “endemic badger TB” did not reinfect cleared areas, and died out just as dietary TB in pigs dies out when the avian, bovine or human TB source disappears (not self-maintaining). Relaxing cattle testing and movement restrictions prematurely simply allows TB back into cleared areas, as in Ulster and Michigan¹⁵; when MAFF were overstretched with FMD in 1967 by restocking to Cheshire²⁴; at the peak of BSE in 1993 with longer test intervals and more restocking movements southwest TB doubled from 121 to 232 herds and the new hotspots of Exmoor, Hereford/Worcs, Staffs/Derby, and Cheshire/Shrops emerged. Hartland also, two year testing, “suddenly” 13 new herds in 1983^{8, 24}.

Failure to achieve complete eradication has been blamed on badgers, but the skin test is only 80% accurate, or 65% on retests. It misses early latent cases which can take several years to come “on stream”; lactation may via immunosuppression temporarily make up to 30% of cases non-reactors; and late TB cases may be swamped with bacilli so go “anergic” and are a very potent source of new breakdowns: three such cases caused 18 herd breakdowns or 10% of the 2¼ year total in Cornwall (see 7f and graph, IFN and an antibody test need^{2, 4, 24}. Up to 46% of Irish breakdowns found by abattoir inspection despite annual testing^{22, 28}. And it is scatter of TB cases from such “unrestricted” herds which cause new breakdowns as is clear in the maps of the Four areas trial with no pre-movement tests since 1996²². Repeat breakdowns may tie up big dairy herds for five years or more, so it was easier in the 1970s with average size of 47 cows to depopulate chronic herds, than now with 70% of dairy herds over 100 cows (routine depopulation if 50 of even 25% herd affected²⁵. With 43% of farm-to-farm movements under 20 km, a mean of 58 km, and a significant number up to 1,000 km amongst seven million, it was not surprising hotspots expanded dramatically after FMD leap-frogging in the two year parish testing “cordon sanitaire” (map in Annex E of Preparing A New Strategy).²¹. A very particular problem with the last remnants of TB in eradication is NVL cases without *M.bovis* confirmed either: up to 70% actually have TB⁸. Shown amongst the 1,099 breakdowns 1972–78: 277 bought-in, including Irish, 37 contiguous, 776 were either unknown or allegedly badger = 78% unknown²⁹. Even West Penwith went clear in 1985, but TB reintroduced three years later and there, with a band south of Redruth, plus Harland with the most intensive dairying became the subsequent hotspots (Dunnet p 8 & 10, 24).

11. DEFRA could not have imagined a more perfect way to show that cattle TB is 99 if not 100% a cattle problem, than the 2001 FMD disaster. It derailed the RBCT cull for 14 months, and the lack of cattle testing and subsequent backlog with no movement restrictions allowed TB to spread like wildfire rising at 18% a year. The 2000 to 2002 jump of confirmed new breakdowns was nearly double 1,039 to 1,902, 8,000 to 23,000 reactors, cost £36 to £75 million. (Hardly attributable to badgers!). 2005 with zero tolerance of overdue tests, now a rise of 35% to 28,000 reactors, cost £90 million.

The rationale behind any badger cull based on the interim results of the Krebs/RBCT trial are spectacularly flawed for two reasons: too few TB badgers culled, and the analyses rely on the view that ANY effect in cattle is due to the badger cull, ignoring the fact that removing large numbers of TB cattle is what reduces TB in cattle (Rocket Science!). (See 4 above). Reactive area. Only three areas enrolled pre-FMD January 2001 with 319 badgers culled, only another 353 making 672 with three more areas by January 2003. So two thirds of the 2,047 badgers culled in the last five months of the cull in 2003 cannot have had time to make the slightest difference to cattle TB.

<i>Triplet</i>	<i>1st Proactive Cull</i>	<i>1st Reactive Cull</i>	<i>Total TB herds/prev three years</i>	<i>Reactors prev year proactive</i>	<i>Initial TB badgers proactive</i>
A Glos/Heref	Jan 2000	Jul 2000	130	57	8
B Dev/Cornwall	Dec 1998	Jan 1999	120	70	13
C E Cornwall	Oct 1999	May 2000	51	62	4
D Hereford	Dec 2002	Sept 2003	55	187	102
E Wilts	May 2000	Jun 2002	56	34	29
F W Cornwall	Jul 2000	Aug 2002	62	14	13
G Staff/Derby	Nov 2000	Aug 2002	51	23	29
H Dev/Somerset	Dec 2000	Jan 2003	43	36	12
I Glos	Oct 2002	Oct 2003	74	154	82
J Devon	Oct 2002	—	55	215	65
				852	357

The 672 may have been 70 with TB, 20 “superexcretors” (multi-lesion) out of 900 km². The rise of 30% in cattle was BEFORE the culls started, so the 27% increase was due to cattle spread. And a year later in reanalysis there was no difference between reactive and survey only: 356 vs 358 breakdowns.^{6, 17, 18}

Proactive area. By contrast, there were seven areas enrolled pre-FMD, with three follow-ups too, but out of the initial 357 TB badgers with TB culled (table), only 127 possibly superexcretors, and five areas less than 20 TB badgers so hardly a cause of a 19% drop in 1,000 km² (column 6). This was due to systematic annual testing being in place longer with a drop to 23% after the follow-up cull ie test/slaughter “biting”. A rise in all areas after FMD (graphs in 29 September report to Minister). The rise of 29% in the area just outside the proactive area due to more FMD slippage since less prioritised testing, dropping to only 22% after first follow up cull hence mirroring the reactive rise. The most marked effects were “cattle” ones with confirmed breakdowns in the smallest inner area 28 km² 107 herds, outer area 71 km² 297 herds, outside that 97 km² 307 breakdowns. Less marked effects for total confirmed and unconfirmed. Big variation in all areas reflect huge differences in historic TB herds: nine to 54/area, or 43 to 130 for total triplet (table, column 4). These effects had nothing to do with culling a few TB badgers or perturbing a few more to emigrate from reactive of proactive areas³¹: Alice in Wonderland “Science”.

12. The other cases which supposedly “prove that badger culls work” are likewise fundamentally flawed. Simply too few TB badgers versus the impact of removing large numbers of TB cattle:

Offaly 141 TB badgers out of 600 km² and 1,458 reactor cattle from 55,000 cattle versus 5646 reactors out of 150,000 cattle in the control area. Three times the population yield three times the reactors.^{7, 9, 17} Four area trial. Only 286 TB badgers out of 960 km² vs 5,000–10,000 reactor cattle. There were twice the number of confirmed breakdowns in the reference area (393) as in the removal area (193) so the same cattle measures did half as well. The new breakdowns were scattered across the area maps (see section 10). And the famous 96% “drop” in cattle TB “due to badger culls” was in fact a flare UP in the reference area^(12, 22 p 23–6). The Thornbury area was down to a single herd before the cull, again a small cattle flare-up before gassing, so nothing to do with badger gassing¹¹. And NOT clear until 1990’s—odd unconfirmed breakdowns yearly.

No-one has shown how badgers are supposed to give cattle a respiratory lung disease, and the supposed effects of badger culling are in fact due cattle culling. Case for any culls unfounded, Old Brock victim not villain. Possums “not guilty” in native Australia⁵; overly blamed in New Zealand recently re-discovering area cattle scheme “works”! Regards to the melancholy moth –eaten possum in Mammal gallery of Natural History Museum where nearby dwells the other great “scientific” hoax/fraud: Piltown Man!

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February 2006

Memorandum submitted by F Wakefield (BTB 13)

I understand the Committee is asking for views from the Public regarding the future control of TB in Cattle. My thoughts may seem radical to some however I do believe these observations are based on practical knowledge and past observations of disease control.

The first observation I am going to give is that to control a Disease everyone must be committed.

The second observation is the fact that this Bacteria cannot be eradicated totally because of its characteristics it can lay dormant for years in a state that is very difficult to address.

The third observation is that if proven fact is not available the next best is probability.

A. Commitment to control this Disease is more about clinical control than medical. I would respectfully ask members to go and visit some farms after they have had a positive test. I think they will be amazed at the lack of any help or advice given by the Dept regarding simple clinical control measures ie steam cleaning, Ultra Violet light sterilisation, general cleaning to create an environment where the Bacteria cannot survive. There seems to be an unwritten theory by both the Department and the Farmer that once tested positive it's slaughter, restriction and nothing else matters. Whereas reality is showing that the Test does not pick up some infections therefore without any further clinical controls there are hosts in this environment that will allow further reinfection at a latter date. (This is exactly how TB was controlled, not eradicated, in humans in the UK and the USA) The problem from the Farmer's point of view seems to be financial and motivation. Because he is going to get compensation he is not really committed to a long term answer if the value of the production were say 10 times the present compensation value every possible clinical control would be used because a valuable asset is threatened. I would once again respectfully ask the committee to regard the overall spend on the control and the trials and divide this by the number of Dairy Farmers (approx 20,000) and see what the figure is (there are Beef Herds as well but we do not know how many are infected from importations from Dairy Herds).

What I am suggesting is that the Department should set the parameters for the control of this disease and give good advice as to its control, but this is a management controlled disease that has to be undertaken by someone who has a very strong commercial interest to control it in his surroundings and make sure if he imports any potential carrier be it animal or otherwise there is a risk assessment that is in his domain. A practical solution may be to offer grants for three years to enable farmers to purchase equipment to clean there premises and also to put a levy on the purchasers of Milk of say 1p per litre to pay for these arrangements.

B. This Bacteria has been around since the ancient Egyptians, it is very difficult to eradicate, affects animals as well as man but can be controlled. The way we control this disease through the NHS is probably the best presently available. We could not afford the cost of the anti-biotic at present values so slaughter would seem the only answer but this is a dangerous sledge hammer to crack a nut that perhaps should have a second chance. Just as with humans some animals are latent carriers these are the ones that should be kept, they either have Genetic immunity or their immune system has achieved a respite from the infection. This is why the Skin Test is firstly unsound in that it does not differentiate between active and latent TB and the test is only perhaps 70% accurate anyway, it's no wonder they do not use it in Hospital. This is not only distorting the overall figures but allowing a waste of resources to occur when these resources should be being used for proper detection as in Hospitals ie mobile X-Ray machines. These should be Privately run and Farmers making purchases or with suspicions of their own stock could buy these services themselves. I come back to the point the onus is a commercial one for every Farmer.

C. There is no proven fact that Badgers do infect Cattle or that Cattle infect Badgers but when Trials like the Irish one and the Thornbury one show such dramatic drops in occurrence after clearances of Badger Setts probability says this is a possible cause with consequential evidence to back it. I do not know of a Farmer who wants just to be rid of his Badgers or any wildlife but it is not fair on the Badger to infect his fellow Badger or any other animal around him. Prior to 1940 Badgers did not have TB, the Cattle must have infected them now probability says they are infecting the Cattle but the why's and wherefores are irrelevant the problem now has to be addressed and what seems ironic is that the Badger Groups are arguing for controls and Clinical clean-up of Farms and Farmers are calling for control of the Badgers I do believe both are correct and both measures need implementing simultaneously. I beg the Committee to not dither any more on this issue and to implement these measures and explain in detail to both parties the need to work together for a common cause.

To sum up I think TB is a Farmers' problem not the Nation's and needs regulation; its financial assistance must come from the Market not the Tax payer.

February 2006

Memorandum submitted by the RSPCA (BTB 14)

EXECUTIVE SUMMARY

The RSPCA hopes that the Committee will carefully consider:

- (a) The underlying issues of the relative roles of cattle and badgers in disease transmission.
- (b) The independent scientific evidence that cattle-to-cattle transmission is the dominant factor in GB.
- (c) The trial results demonstrating that badger culling may make matters worse—however efficiently it is undertaken.
- (d) Why scientific advice from the ISG and SAC is not properly reflected in the consultation paper and policy proposals.
- (e) Why so much preparatory policy work on badger culling was undertaken in advance of, and therefore without the benefit of, the trial results.
- (f) Whether, in the circumstances, seeking to eliminate badgers from large tracts of countryside is a proportionate response—and whether it is contrary to one of the sustainability principles underlying the trial.
- (g) The veterinary assumptions underlying badger culling proposals.
- (h) The evidence that modest improvements to cattle testing could be sufficient to bring the epidemic under control.
- (i) How, in a multi-factorial policy experiment, the effects of the various components could be assessed.
- (j) The implications of a policy change away from using government staff and relatively humane methods to private individuals using undeveloped methods.
- (k) The problems inherent with the possible use of carbon monoxide to kill badgers
- (l) The problems associated with the possible use of snares to catch badgers.

INTRODUCTION

1. The RSPCA welcomes the opportunity to submit evidence to the inquiry. The charitable purpose of the RSPCA is “to promote kindness and to prevent cruelty to animals”. The RSPCA welcomed the long overdue announcement by Defra on the 15 December 2005 of the introduction of pre-movement testing. However, the RSPCA expressed its concern at the consultation about badger culling launched at the same time.

QUESTIONS TO BE ADDRESSED

2. The RSPCA hopes that the Committee will not go straight into the detail of the 20 consultation questions, posed by Defra, in relation to the specific badger culling proposals. We hope that the Committee will take the opportunity to carefully consider the underlying issues of the relative roles of badgers and cattle in disease transmission and the implication of the results of the proactive badger culling trial that were published on the 14 December 2006 in online editions of the scientific journals “Nature”¹ and the “Journal of Applied Ecology”.²

3. The questions “What is the contribution of badgers to TB infection in cattle?” and

“How significant is cattle-to-cattle transmission?” are interrelated. However, in our view, a central point of the debate is the relative role of badger-to-cattle transmission compared to cattle-to-cattle transmission. Since the Science Advisory Council considered cattle-to-cattle transmission to be the “dominant” factor then draconian measures against badgers over large parts of SW England are, in our view, not appropriate or proportionate.

4. The Science Advisory Council (SAC) was established in February 2004 to provide Defra with expert, independent and published advice on science policy and strategy. This advice is communicated to Professor Howard Dalton, the Chief Scientific Adviser (CSA), and through the CSA to Ministers. In 2005 a sub-group of the SAC considered the Literature Review of research on bovine TB commissioned by Defra and provided an overview assessment for the CSA on the quality of the available scientific evidence. Their advice is available on Defra's website.³

5. Their conclusion was that “a substantial proportion of infection of cattle in GB at present is not due to infection by badgers, but is associated with other mechanisms such as cattle-to-cattle transmission.” In this respect we would also note that in a short parliamentary debate the Minister stated that “Eighty per cent of TB cases are spread from cattle to cattle . . .”⁴

6. The SAC’s conclusion was therefore that “Culling of badgers is therefore unlikely to be an effective control measure unless and until further measures to reduce breakdowns due to mechanisms such as cattle-to-cattle transmission have been implemented successfully.”

7. At the bovine TB seminar for MPs held in September 2004 the veterinary epidemiologist heading a research team at the Veterinary Laboratories Agency stated that compared to twenty years ago the situation now is entirely different. Data sets on cattle movements were available that they never had before and these show huge numbers of animals are moving around, especially locally. In his view “The short-term gains are far greater from controlling cattle movement than from killing badgers.”⁵

8. Given such specific scientific advice, repeated from different sources, the RSPCA then asks whether it is appropriate, and proportionate, to be contemplating at this stage severe measures against badgers over very large areas of western England?

9. Additionally, and very importantly, the recent scientific results show that killing badgers does not necessarily reduce the incidence of TB. The interim results of the trial published in December 2005 showed that proactive culling decreased TB in the culled areas by 19% but increased it in the surrounding areas by 29%. The overall impact on disease levels in cattle was therefore close to zero. This is considered to be due to increased movement of badgers as they move in from outside the culled area to occupy vacant territory. According to the Chairman of the Independent Scientific Group this would not be diminished however efficiently a cull within an area is undertaken.⁶ A point reinforced in an open letter to stakeholders from the ISG which stated that “there are no scientific data to support suggestions . . . that culling efficiency would decrease the edge effect in non-culled adjoining areas.”⁷

10. The Chairman of the ISG initially expressed disappointment at the Defra announcement stating that they had misinterpreted the science.⁸ Some subsequent interviews have indicated that he thought would be better to focus on cattle controls.⁹ A recent open letter pointed out that the ISG considered the consultation paper to be inaccurate in important respects. In particular that “there is solid scientific evidence that two of the culling strategies proposed will increase rather than decrease cattle breakdown rates and the consultation paper fails to make this finding clear.”¹⁰

11. We believe that there is therefore a question as to why the scientific advice is not properly reflected in the consultation documents and policy proposals? Why, for example, was so much preparatory work done on the Partial Regulatory Impact Assessment (RIA) and the consultation documents in advance of the interim results of the proactive trial? Is there “a rush to cull” by sections of Defra? The apparent haste to formulate a policy on badger culling is in marked contrast to the three years taken to consult on, and develop, measures for the pre-movement testing of cattle.

12. One of the principles underlying the badger trial from the outset was that Ministers had made clear that the elimination of badgers from large tracts of the countryside would not be politically or socially acceptable.¹¹ The RSPCA would be interested to know whether this is still the government’s view? Whilst the recent results indicate that systematic and prolonged culling over very large areas might help to reduce TB incidence in cattle the RSPCA does not accept that this is a proportionate response to the issue when, for example, the SAC has acknowledged that cattle-to-cattle transmission is the dominant factor.

13. In this context the RSPCA notes that recently published modelling work by the ISG indicated that relatively modest improvements either in TB test performance or TB testing frequency would be sufficient to bring an epidemic under control.¹² Therefore the Society would ask why more effort is not being focussed on such aspects?

14. The veterinary advice to Defra (produced before the proactive culling results were available) was that the most effective management option of reducing the likelihood of transmission from badger to cattle combined “culling badger social groups *identified as infected*” (our emphasis) and altering farm management practices. On the first point we would point out that there is currently no practical tool that can be applied on a field scale for identifying infected social groups. One of the aims of this suggested culling was to reduce “the frequency of contact of infected badgers with cattle”. However, the recently published work by the ISG and others illustrates that badger culling has the potential to actually *increase* contact rates between infected badgers and cattle. (ref 2) The veterinary advice is therefore rather dated and simplistic in its assumptions and this is an area on which the Committee may wish to question the scientists involved.

15. The consultation paper states that removing sources of infection is a fundamental principle of infectious disease control. However, in recent years there have been a number of exceptions to this principle involving wildlife. For example, during the Foot and Mouth Disease epidemic the official government veterinary advice regarding deer and suspected FMD was “Take no action against the deer. Attempts to cull are likely to increase the risk that disease will spread, not diminish it.”¹³ Repeated culling of foxes on the continent did not prevent either the geographic expansion or re-occurrences of rabies infection. When the pathogen causing the infection in wildlife, rather than the host itself, was targeted by an oral vaccination programme a dramatic decrease in rabies was observed.¹⁴

16. There are various references in the consultation and partial RIA to monitoring the effect of what actions they take. However, if the government goes down the road of licensing badger killing as well as introducing pre-movement testing and they also implement additional gamma interferon testing they will have put in place an uncontrolled multi-factorial experiment. Given a situation in which three elements have changed how do Ministers propose assessing what effect (if any, whether positive or negative) each, or any, of the actions is having? Might, for example, the negative effects of ineffective badger culling cancel out the predicted gains from pre-movement testing? Such a mixed effect is quite feasible but the respective roles could not be determined from implementing such a mixture of policies—and the government would be none-the-wiser as to the nature of the most effective disease control element.

17. There are also questions regarding the potential implications of sanctioning badger culling on other research and policy options. Last June Defra announced the establishment of a vaccine field study in a high prevalence area of the SW.¹⁵ Given this, what steps would be taken to safeguard not only the vaccine trial area but a buffer zone around it from licensed culling bearing in mind the sort of “coalescing culls” option portrayed in Figs 3 and 4 (page 37) of the consultation?

18. The analysis of costs and benefits in the Partial Regulatory Impact Assessment is based on the assumptions that about half of all confirmed TB incidents arise from badger-cattle transmission and that these can be reduced in proportion to the reduction in the badger population. As far as we are aware there is no scientific basis for either of these assumptions. The first assumption is contradicted by the advice and information referred to above. The fact that the long-term studies at Woodchester Park have shown that the prevalence of infectious badgers in the population fluctuates widely and bears no linear relationship to badger density¹⁶ coupled with the results of the reactive and proactive elements of the culling trial contradict the second assumption. The Defra veterinary advice acknowledged that “the likelihood of a badger passing infection to a bovine is directly related to neither prevalence nor the incidence of bTB amongst badgers in the area of interest.”¹⁷ Additionally, the Defra press release announcing the results of the badger Road Traffic Accident survey stated that the findings showed “no clear correlation between the levels of TB in cattle and badgers”.¹⁸ The RSPCA therefore believes that these are areas that should be questioned in relation to the RIA and the culling proposals.

19. The methods used during the culling trial to capture and despatch badgers were subject to independent humaneness auditing as well as assessment by the ISG. The audit reports indicated that the methods used and the approach of the staff employed meant that the operations were carried out relatively humanely. The ISG also published two scientific papers on welfare aspects. However, the government proposals appear to rule out such a method in favour of those that are largely untried in this country and also using farmers/landowners to operate them. Contrary to the impression given by the consultation document, badger control operations since 1975 have been undertaken by government staff. Therefore the proposed route marks a profound departure from previous policies. The RSPCA is very concerned at this proposed change in the direction of travel and hopes that the Committee will question the implications of such changes.

20. In relation to possible methods of killing badgers the consultation raises the possibility of gassing badgers with carbon monoxide (CO). Before considering this in more detail it is worth noting the parliamentary answer given by the Minister on 31 March 2004. This stated that “The gassing of badgers in their setts is not regarded as an acceptable method of killing them because of the difficulty of ensuring the correct concentration of gas throughout the sett, using the methods of delivery and gas combinations that are currently available . . .”¹⁹

21. The size and complexity of some badger setts illustrates the sort of problems inherent with such a technique. Main setts have been recorded with up to 80 entrances, a combined tunnel length of some 80 metres, volumes of some 25m³ and having involved the excavation of some 25 tonnes of soil.²⁰

22. The consultation paper briefly points out that questions remain regarding the manner of producing CO and its use. However there are many uncertainties and concerns, referred to in the detailed background review document produced by Defra.²¹ The RSPCA believes that it is important to highlight some of these since some farmers currently appear to believe that is acceptable to use tractor exhaust to gas badger setts and some organisations are saying that CO must be used.

- A. CO is currently not an approved vertebrate control agent in the UK. Its use is therefore illegal.
- B. Diesel engines produce very low concentrations (0.2%) of CO but high concentrations of irritant nitrogen oxides (NOx).
- C. In one experiment, death in rabbits only occurred after at least seven hours exposure to diesel fumes.
- D. The EU restricted, on welfare grounds, the use of any exhaust fumes for euthanasia of mink (a member of the mustelid family which includes the badger).
- E. Neonate animals have a greater capacity to tolerate hypoxia after CO exposure than adults. In experiments involving fox dens this resulted in cubs surviving but the vixens being killed. It is reasonable to assume that young badger cubs would also be more resistant to the effects of CO.
- F. Sub-lethal concentrations of CO can result in anoxia and thus permanent brain damage.

- G. Were CO generated by badly tuned petrol engines (without catalytic converter) to be considered then more information about the potential detrimental effects of exhaust pollutants would be required.
- H. CO can dissipate rapidly in sandy soil and thus soil composition can be an important factor to consider.
- I. Practical aspects such as weather conditions may affect outcome.
- J. The effectiveness and potential humaneness of CO is dependent on appropriate concentrations of the gas being produced and disseminated throughout the burrow system. The unpublished modelling work indicates the difficulties of achieving this, particularly into blind tunnels.

23. In the RSPCA's view it is clear that there would need to be much more work undertaken, and published in peer reviewed journals, before such method could be contemplated for use against badgers (or indeed other animals) in this country. This sort of work would be necessary before regulatory approval could be considered. There should be a presumption against gassing until such time. Therefore in the circumstances, in our view, the consultation questions on this aspect are not relevant.

24. The consultation raises the possibility of body snares being used to capture badgers. The RSPCA notes that, in contrast to the questions on other methods, the questions on snaring do not include whether snaring would be acceptable or appropriate. Their use by two research biologists in one, now rather dated, study quoted in a background reference document was subject to inspection *every two hours*. Such an inspection regime also applied in the past when snares were occasionally used by MAFF personnel to capture trap shy badgers. Were farmers to be licensed to use such a method would they be expected to undertake such a rigorous inspection regime? Would they do so?

25. In contrast to the scientific papers that the ISG have published on the animal welfare aspects of the methods used in the badger culling trial as far as we are aware no equivalent papers have been published in relation to the methods used in badger control operations in the Republic of Ireland.

26. In view of the serious adverse welfare consequences that snares can have on animals and the risk they pose to non-target species the RSPCA is opposed to their use. As one of the background reports (Ref 21) points out, apart from competence issues of any personnel involved in using such snares, there are gaps in the information regarding the use of body snares and injuries and non-target capture rates. The consultation document states that "trials and field testing of the humaneness of the body snare would be carried out." If such testing is to be undertaken then consideration of such a method is again premature in the absence of any results and their subjection to scientific scrutiny.

27. *Conclusion.* The scientific evidence indicates that cattle based measures are much more likely to be effective at reducing the incidence of the disease than badger culling. The trial results show that badger culling could well make matters worse. Eliminating badgers from large tracts of countryside is an unacceptable and disproportionate response. The RSPCA's view is therefore that in the current circumstances the answer to the first consultation question is "no". In the present state of knowledge consulting on the possible use of gassing and body snares against badgers is premature.

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February 2006

**Memorandum submitted by English Nature, on behalf of the Natural England confederation
(English Nature and the Rural Development Service) (BTB 16)**

EXECUTIVE SUMMARY

1. English Nature shares the Government's concerns about bovine TB in cattle, and is firmly of the view that a new evidence-based strategy is needed. Introducing a badger culling policy that is unsupported by the results of scientific research runs the risk of making the situation worse.
2. Our view is that there is no scientific support for small area reactive or proactive culls covering less than 100 km², and this policy option should not proceed.
3. If large area culls (over 300 km²) were to be considered, issues of badger conservation and cull deliverability need careful attention before any policy is adopted. It would need to address the fact that there is no evidence that even a complete badger cull would reduce the frequency of herd breakdowns by more than 60% at most.
4. Elimination of local populations at a scale of several hundred square kilometres would negatively affect the conservation status of badger in England, and culls on this scale would be opposed by English Nature. It is likely that the UK would come into conflict with the Bern Convention over culling on this scale.
5. We have concerns about the lack of selectivity of any cull, since all badgers would be killed, not just infected ones. Estimates indicate that between 77% and 92% of badgers culled could be healthy. There is urgent need for the development of a sensitive and specific live test for bovine TB in badgers.
6. The deliverability of a large area cull is a key issue that needs much more research. The indications are that this would be very difficult to achieve, and partial deliverability would potentially make the situation worse. Access to land for culling purposes is most unlikely to be comprehensive. We believe that the modelling used for small area culls needs to be redesigned and extended to address fully the uncertainties of large area culling. The culling efficiency of large area culls in the UK is completely unknown, and so could not form the basis of an evidence-based strategy.
7. We are deeply concerned that the simultaneous introduction of three new initiatives (table valuations; pre-movement testing; and badger culling) means that it will be virtually impossible to determine the extent to which any individual component contributes to any observed changes.
8. We believe that pre-movement testing and other measures to reduce cattle to cattle transmission should be implemented immediately and independently of any badger cull. Now that small area badger culls can be effectively ruled out, much more investigation of the conservation impact and deliverability of a large area cull is needed before such a policy is considered.

ENVIRONMENT, FOOD AND RURAL AFFAIRS COMMITTEE: INQUIRY INTO BOVINE TB AND BADGER CULLING

1. English Nature shares the Government's concerns about the increasing prevalence of bovine TB (bTB) in cattle in some parts of Britain. Current strategies are demonstrably failing to halt the deteriorating situation, and we are firmly of the view that a new evidence-based strategy is needed. Introducing a badger culling policy that is unsupported by the results of scientific research runs a significant risk of either failing to improve the situation or perhaps even making it worse. A policy that culled thousands of badgers but resulted in no demonstrable improvement in the situation would be the worst outcome for both government and the farming community.

2. The interim results of the Randomised Badger Culling Trial (RBCT), published recently in *Nature*, demonstrated very clearly some of the pitfalls of badger culling strategies. In its analysis of this and other studies, the Science Advisory Council (SAC) concluded that localised culling is likely to be counter productive and that any area to be culled needs to be at least 300 km², and preferably more, in order to avoid an overall adverse effect. Our view is that there is no scientific support for small area reactive or proactive culls, covering less than about 100 km², and that this policy option need be considered no further.

3. If large area culls (greater than 300 km²) are to be considered, issues of badger conservation and cull deliverability need careful attention before any policy is adopted. The SAC review concluded that spatial coverage within an area to be culled would need to be effectively complete to avoid the creation of a mosaic of unculled and perturbed areas where incidence would be likely to increase. This suggests that the only scientifically justifiable policy objective would be the control of badgers over the total cull area, as partial culls run the risk of making the situation worse. A similar argument applies to the intensity of culling. The RBCT showed a decrease of 19% in herd breakdowns within the proactive cull area in response to a substantial (but not accurately known) reduction in the badger population, whilst a decrease of nearer 60% was achieved in the recent Irish trial, which almost completely removed badgers from the trial area. Although the RBCT shows some benefit may be achieved with an imperfect cull, there is no clear relationship between badger density and the incidence of herd breakdowns, so there is no target badger density that could be recommended as adequate to deliver an improvement. The only scientifically justifiable policy objective would therefore be the removal of as many badgers as possible rather than the maintenance of a low-density population. This twin objective of complete coverage and complete removal presents formidable difficulties, particularly as there is no evidence that even a complete badger cull would reduce the frequency of herd breakdowns by more than 60% at the most.

4. Although the badger is not a rare or threatened species, the elimination of local populations at the scale of several hundred square kilometres could negatively affect the conservation status of the species in England by reducing its natural range. Culls on this scale, resulting in the long-term removal of badger populations, would be opposed by English Nature. Even a temporary removal at this scale would be a significant conservation concern, particularly if the objective is complete removal. We would wish to see a detailed assessment of the response of the regional badger population to the predicted rate and spatial pattern of a cull in order to quantify the wider conservation impact. In addition, a large-scale culling policy would bring the UK into conflict with the Bern Convention, which prohibits methods of control that result in the local disappearance of species

5. The lack of selectivity of any cull remains a significant issue. Because it is not possible to determine with any certainty whether an individual live badger is infected with bTB, a badger culling policy would seek to remove all badgers, regardless of their disease status. Estimates of the county-level prevalence of infection made by the ISG from a survey of badgers killed on the roads ranged between 8% (Devon) and 23% (Gloucestershire), meaning that between 77% and 92% of badgers culled could be healthy. This problem could only be addressed by the development of a sensitive and specific live-test that could be applied to trapped badgers and this remains an important research need.

6. The deliverability of a large area cull is a key issue that needs much more research. In the Irish “four areas” trial, the almost complete elimination of badgers was achieved over areas of about 250 km², but the starting density of badgers was much lower, intensity of removal was very high and landowner co-operation was almost complete. After four years of badger removal, the level of herd breakdowns was reduced by about 60%, but the disease was not eliminated from any of the trial areas. All culling was carried out by full-time staff of the Department for Agriculture and Food. This state run approach has already been ruled out in the UK after cost-benefit analysis demonstrated there were few circumstances under which a government-funded badger cull would be cost-effective.

7. Badger culling by licensed farmers or their agents has been proposed, as this could overcome the unfavourable cost-benefit ratio of a government-funded cull. Possible methods under consideration include shooting, restraints and gassing, though all these present difficulties. Any culling would need to be licensed under the Protection of Badgers Act 1992 and a licence could only be issued where the licensed action was likely to achieve the purpose of preventing the spread of disease. The extent to which the landowning community would take on this role is unknown.

8. There are several major considerations when determining whether a large area cull could achieve an overall reduction in the incidence of bTB in cattle:

- (a) Access to land. In the Irish trial, operatives had access to almost 100% of land, but this is unlikely to be the case in England. Some pertinent data on the subject are available from the RBCT, where the percentage of the trial area for which permission to cull was available ranged between 48% and 76% (mean 66%). If a similar figure is achieved in a large area cull, this appears to fall well short of the “effectively complete” coverage advised by the SAC. Further information can be obtained by considering maps showing the distribution of agricultural holdings derived from information held on the Rural Land Register. We are aware that some simple modelling work based on these data has already been done for small-area culls for Defra Animal Health Division and has illustrated some significant challenges to a comprehensive cull, related to patterns of land ownership and the proportion of land not in agricultural holdings. This work should now be repeated using areas of about 300 km² centred on TB “hotspots”.

- (b) Culling efficiency. In the Irish trial, where badger densities were low, culling efficiency was considered high as all work was carried out by professional operators, badgers were captured with restraints, no closed season was observed and removal operations took place two or three times a year. In the RBCT, where badger densities were higher, all culling was carried out by professional operatives, but efficiency was constrained by the permissible method of capture (cage traps), access to land, security considerations and the need to observe a close season. The exact trapping efficiency achieved is unknown. Although a significant reduction in badger activity was recorded, it was certainly short of complete elimination. The efficiency that might be achieved by licensing farmers or their agents to carry out a badger cull using shooting or other agreed methods is completely unknown and so could not yet form the basis of an evidence-based strategy.
- (c) Persistence. Any area subject to a wide area cull would need to be maintained more or less free of badgers for a considerable period to sustain any improvement in herd breakdown rates. No policy decision has yet been made about how long such a situation should persist, but the assumption is that this would be until badger or cattle vaccination could be introduced. In addition, experience with the removal of invasive non-native species shows that a high level of effort and surveillance is required to remove the last individuals and prevent subsequent re-establishment. The difficulty of maintaining this effort should not be underestimated.
- (d) Public acceptability. Whilst recognising that the badger plays some role in the maintenance of bTB infection in cattle in some parts of England, it must also be recognised that it is an immensely popular animal. Any culling policy, and anyone delivering that policy, will be under intense public scrutiny. This is likely to place significant practical constraints on delivery.

9. We remain very concerned that the simultaneous, or near-simultaneous, introduction of three new initiatives, table valuations, pre-movement testing of cattle and badger culling would make it very difficult to determine the extent to which each of these contributes to any observed change in herd breakdown rates. We recognise the seriousness of the situation, but are not persuaded that the need to reduce the level of herd breakdowns outweighs the need to be clear about the contributions of various initiatives. Unless steps are taken to separate the introduction of these treatments, particularly pre-movement testing and badger culling, it will be difficult to work towards a cost-effective long-term strategy that minimises the number of cattle and badgers killed.

10. In our view, pre-movement testing and other measures to reduce the cattle to cattle transmission of bTB, which the SAC considers probably the dominant infection route at present, should be implemented immediately and independently of any badger cull. Now that small area badger culls can be effectively ruled out, much more preparatory work on the conservation impact and deliverability of a large area cull is needed before such a policy is considered. For culls on this scale, the impact on the conservation status of the badger is a significant issue requiring further consideration. In addition, we are not aware of any persuasive evidence that the landowning community would be able to implement a badger cull of adequate coverage and intensity to achieve an overall reduction in herd breakdowns.

February 2006

Memorandum submitted by J Simpson (BTB 17)

1. I Strongly oppose badger culling on the following grounds:
2. It has not been proved that the badgers have been passing TB on to cattle.
3. Cattle have been subject to other diseases more recently foot and mouth. Some of the problems with diseased cattle could be found in the methods of animal husbandry and farming methods. It wasn't that long ago that it was discovered that animal foodstuffs had been given to cattle—contrary to their natural diet.
4. What other research has been conducted to determine why cattle contract TB without immediately putting badgers in the frame.
5. Why not face the inevitability that cattle should be inoculated against TB. I understand some farmers are refusing to have cattle with TB killed. Does this not indicate that some farmers are very unsure of the badgers role in passing on TB.
6. It is the government's duty to stop throwing the problem at badgers and hope that by culling them the problem will go away.
7. Finally—on an ethical note—have we not moved further on than the Middle Ages if our parliament is prepared to wipe out a species to protect our food chain. How arrogant is it to protect human interests with such a clumsy, thoughtless and cruel strategy.
8. What about issues of protecting wildlife and the balance of our environment.
9. I demand that you think again and look at the answer coming from the other direction—namely protect the cattle from being able to contract the infection which could come from a number of other sources. You just don't know—so—please do not replace your anti-hunting Bill with a Badger Culling Bill. How retrogressive is that? They are a beautiful, harmless and shy species. Leave them alone.

February 2006

Memorandum submitted by J Thornton BSc, BVetMed, MRCVS (BTB 18)

EXECUTIVE SUMMARY

1. I am a new graduate of the Royal Veterinary College, and I am currently working at a mixed practice in Worcestershire. During the last two years of our study, my colleagues and I received extensive training and practice in critiquing scientific papers. I have read “An Epidemiological Investigation Into Bovine TB, Fourth Report of the ISG on Cattle TB” in the hope it would shed some light on the epidemiology of TB in the UK cattle herd. There are several aspects of the study that concern me, especially since it is part of the scientific basis from which future TB policies will be formed.

2. First, there are several flaws in data collection (largely due to the Foot & Mouth Disease outbreak) and there is a lot of variation in culling procedure within the treatment groups. Professor Bourne is quick to argue that policies must be based on science, yet many generalized and sweeping statements are made throughout the paper that are not based on scientific fact. Professor Bourne contradicts himself in different sections of the paper, and certainly doesn't take criticism well from the Independent Review Committee, whose suggestions seemed fairly common sense (section 1.18). In fact, he seems almost biased towards exonerating badgers instead of finding the truth about their role in the TB disease complex. Also, the “results” that have been given for the reactive treatment areas are presented as solid scientific fact, when in reality the statistics are not all that strong. As an aside, it is worrying that these same “facts” have been used in recent RSPCA ads to influence public opinion that badgers are innocent victims in the TB debacle. The fact that badgers can be and are infected with bovine TB means they inevitably play a role in the disease complex, however big or small.

3. Overall, the design of the study is good and well thought out. However, the study has not been implemented and carried out well. This has allowed even more variation within the treatment areas (which could have been better limited despite the FMD outbreak). This variation can have large effects on the resulting data, and no amount of statistical analysis can make good results come from poor data. I believe that the interpretation and use of the results of this study in creating TB culling policies need to be done very carefully and with a large pinch of salt.

1. FMD DISRUPTED CULLING

In section 1.5, page 9, Bourne states that he does not believe the FMD epidemic had a large impact on the trial's integrity and outcome. I disagree. The aim of the study was to determine “the effect on the incidence of bovine TB of two different approaches to badger culling, each of which represented a potential practical policy option” (section 1.4, page 9). The very fact that FMD disrupted and delayed culling in the proactive and reactive culling areas completely debases the foundation of the study by allowing a source of variation to come into the treatment groups.

1.1 Variation in Proactive Area Culling

In the proactive areas, badger densities were to be reduced to low levels and maintain this low density by culling every five to nine months. Seven of the 10 proactive areas received the initial cull and were active before FMD. However:

- (a) 5/10 proactive areas had > 1.5 years delay between initial and first culling; three of these five were > 2 years (see table 3.1, page 24); and
- (b) only two of the 10 areas had recommended five to nine month wait between initial and first cull as stated in standard operating procedures in section 3.16, page 23.

Bourne argues that the seven areas activated before FMD continued to “accumulate functional data” during FMD “because badger numbers had been reduced”. Later on in sections 3.19–3.21, several of the proactive areas' first follow up culls resulted in more badgers being culled than in the initial cull. This is explained by the seasonality of the culls, but is it possible for the badger population to have increased in the 25 month delay between the initial and first follow-up culls?

1.2 Variation in Reactive Area Culling

In the reactive areas, badgers were supposed to be culled when there was a notification of a TB herd breakdown. However:

- (a) 36% of notifications were not culled, mostly due to some ministerial announcement (section 3.25, page 27). That is over a third of the notifications received in the reactive areas!
- (b) Of the notifications that were culled, some had full and others partial culls.
- (c) No culling of badgers was allowed during the “closed season”, so if a notification was received during these months, culling was delayed.

- (d) The numbers of badgers culled in the reactive areas were very small compared to the numbers culled in the proactive areas (Appendix D, Table 3.5 vs Figure 3.4). Does culling 100 badgers over three years in triplet A really going to make any difference?
- (e) Bourne admits in Section 3.61, page 38 that “delays to reactive culling imposed by the closed season have been linked to the failure of this experimental treatment to reduce the incidence of cattle TB.”

1.2.1 This is far too much variation within the reactive treatment groups. The resulting data from the reactive areas are then lumped together for statistical analysis. Is it any wonder with no culling, partial culling, and full culling in this treatment group resulted in such wide and imprecise confidence intervals (section 3.41, page 33)? I can't see how any useful information can be obtained from the reactive areas in this trial. The whole point of this treatment group was to determine the effect of reactive culling on incidence of TB in cattle herds, and every notification should have been culled as similarly as possible.

1.3 *Seasonality affected numbers culled*

It is obvious that season has an effect on badger activity and thus the number of badgers caught for culling. This is another source of variation within and between the proactive and reactive treatments.

1.4 *Badger densities difficult to measure*

It was difficult to measure the effectiveness of badger culling carried out in the course of the RBCT (section 3.30; page 30).

- There is no precise way to measure badger density.
- Quantification of badger field signs are imprecise.

2. GENERALIZED AND SWEEPING STATEMENTS

2.1 *“Clear Conclusions” From Reactive Trial Areas*

Bourne declares in section 3.42, page. 33 that “The clear conclusion supported by all the analyses undertaken by the ISG is that there is convincing evidence that reactive culling of badgers does not offer a beneficial effect large enough to make it useful as a practical policy option and that there is substantial but not overwhelming evidence of an adverse effect of the reactive strategy.”

- (a) The evidence is far from convincing and the conclusions far from clear!
- (b) Please refer to paragraph 1.2 of this letter. Any results from the reactive treatment areas will be as varied as the culling within this treatment group. Therefore, how can reactive culling (or should I say no culling in 1/3 of notifications, partial culling or full culling) be associated or linked with anything, let alone an increase incidence of TB in cattle?
- (c) The wide confidence intervals accompanying the supposed increase in TB incidence in reactive areas verifies the imprecise and varied results.
- (d) Who determines whether “a beneficial effect” is or is not “large enough”? Statisticians playing with data? Pro-badger groups? Farmers shut down due to TB in their herds? Policy-makers pressured by all of the above?
- (e) It does not matter how “extensive and carefully conducted” statistical analyses are carried out. If you put garbage data in you will get garbage results out. This is why the way a study is designed and performed is so very important!

2.2 *Ignoring the Wildlife Component of TB*

I am concerned about the statement made by Professor Bourne in section 9.9, page.62, that suggests focussing only on cattle factors and ignoring the wildlife components could lead to improvement of TB control.

- (a) This is an unsupported and dangerous suggestion, especially from someone who is so concerned that TB policies should be based on good science (section 1.18).
- (b) TB disease complex is influenced by many different factors, and wildlife acting as TB reservoirs are involved in this complex.
- (c) Badgers are without doubt acting as wildlife reservoirs for the disease, simply because it is known they can be and are infected with bovine TB. Bourne states this as well (section 1.18).
- (d) In Appendix D, data on the badger removal operations in trial areas under the interim strategy show that a high percentage of the badgers caught were infected with TB. This ranged from 13–76% (mean = 26%, median = 23%).

2.2 1 That is a quarter of the badgers removed infected with TB!! If any disease had such a high incidence in the human population, there would be mass hysteria!

2.2 2 How can Bourne suggest that the wildlife component of this disease complex be ignored?! Even if cattle to cattle transmission is found to be the main way the disease is spread, surely such a high percentage of TB in the badger population should be addressed, for badger welfare if nothing else.

3. THE RBCT IS NOT GOOD SCIENCE

3.1 *Policy Should Be Based on Good Science*

Professor Bourne is insistent that good science form the basis of TB policy-making. In Section 1.18, page 15, Bourne says “it is obvious that badgers are ‘implicated’ simply because we know that they are susceptible to bovine TB infection and therefore inevitably a part of the overall disease complex; but that does not suggest what, if anything, should be done about it.” I agree with Professor Bourne on this point, however I don’t believe the RBCT has shed any light on badgers contribution in the disease complex, and certainly the “benefits of the trial’s findings” will not aid the Ministers in forming policy decisions.

3.2 *Hidden and Exposed Results*

He was agast that the Independent Review Group recommended “premature release of trial data, an action that would violate the generally accepted principles of conducting trials of this sort while offering no clear guidance as to how policy might be improved.” Yet in section 3.39, in regards to the apparent increased incidence of TB in reactive culling areas, Bourne and colleagues were “obliged to bring this information to the attention of Ministers”. Results from the proactive treatment group were not reported on.

3.3 *Public Manipulation*

Why is it that the data from the proactive treatment remains strictly confidential at this time when the reactive data “results” have been freely exposed? Why is it that these same results and conclusions have been used in RSPCA ads to sway public opinion? Not only are the conclusions from the reactive treatment based on a poorly conducted trial, they are now being used to incite public opinion against farmers and for badgers in the hopes that the public will pressure policy makers not to cull badgers. These tactics are appalling! This is not science and wisdom guiding policy. This is manipulation.

4. LET’S LEARN FROM THE PAST

4.1 *Past UK TB Epidemic*

It is important to have some common sense and look to the past for guidance in making TB policies. According to the DEFRA website, the outbreak of cattle TB that occurred in the 1950’s was controlled by a compulsory test and slaughter policy (using the tuberculin intradermal skin test that Professor Bourne has rubbished in his Fourth Report). By 1980 the incidence of TB in the UK herd was low.

4.2 *What has changed?*

So what has changed that this same method is not working to control TB today?

- (a) Badgers became a protected species in 1973, and further regulations in 1975 and 1980 increased this protection.
- (b) The UK badger population today is estimated between 250,000–300,000. Badgers like using well-trodden paths; they like eating maize and other food sources readily available on farms; they use straw to line their burrows; they prefer to live near wooded areas on farmland;
- (c) The badger population is infected with bovine TB.
- (d) I feel that policy needs to carefully weigh the implied impact of the badgers’ role as a wildlife TB reservoir.

4.3 *Other countries*

As far as I am aware, only Great Britain and Ireland have a rampant TB problem in their national herds today.

- (a) What have other countries done to control TB in their cattle herds?
- (b) Was there a wildlife reservoir contributing to the problem?
- (c) Was a culling policy initiated and did it make any difference?

Memorandum submitted by D J B Denny, BVET MED MRCVS (BTB 19)

1. EXECUTIVE SUMMARY

1.1 *Preamble*

Historically TB was eradicated from our herds because there was no reservoir of infection in the wild life.

1.2 *Tuberculosis*

TB is an infectious disease of all mammals with a very slow onset of symptoms.

1.3 *Badgers*

With over 30% in some areas having TB it is endemic in the badger population. It is beyond all reasonable doubt that they are the reservoir of infection to cattle.

1.4 *Tuberculin test*

It is the internationally recognised test that was used to eradicate TB from our herds 50 years ago.

1.5 *The blood test*

It is far too sensitive resulting in too many cattle being culled. It only might have a place where there is no reservoir of infection in the badgers.

1.6 *Herd breakdowns*

The pattern of herd breakdowns is such that there MUST be a reservoir of infection other than cattle.

1.7 *Science*

Much of the Science appears biased and is flawed so cannot be taken at face value.

1.8 *Krebs trial*

The trial under Professor Bourne was doomed from the onset. It was poorly designed, by those with minimal knowledge of badgers and badly executed. Insufficient badgers were culled. In spite of these failings it did demonstrate the badgers are responsible the transmission of TB to cattle.

The science is seriously flawed.

1.9 *Independent Scientific Group chaired by Professor Bourne*

This is certainly not impartial. It is attempting to defend the flawed “science” in the Krebs’s trial, by rubbishing others’ work. They appear to be sacrificing their integrity to salvage their credibility.

1.10 *Cattle to cattle transmission of TB*

It is, in my experience, very limited and insignificant overall.

1.11 *Cattle movements*

Transmission of TB does result from movement in a few incidents. Provided there is no badger reservoir, once the reactors have been culled, herds remain clear.

1.12 *Conclusion*

Infected badgers are by far the most significant reservoir of infection responsible for the current crisis. An efficient cull will benefit not only the cattle population but the badger one too.

1.13 *The cull*

Badger culling must be the most humane and cost effective. The only method is by gassing them in their setts with Carbon Monoxide gas from exhaust fumes.

2. PREAMBLE

2.1 As a Veterinary Surgeon with 45 years of clinical experience in the field, there has been a very significant difference in the outbreaks of TB in cattle herds, over the latter years.

2.2 In the 1950s and early 1960s using the tuberculin skin test TB was eradicated from herds; they then remained free of TB for 30 to 40 years. The deterioration has been gathering momentum for the last 15 years, and has now become a catastrophe.

2.3 Since the 1970s the badgers were made a protected species and around the same time farmers started to grow maize, which became the badgers’ preferred food and being high in energy resulted in them being more fertile and having a higher survival rate. Consequently there has been a significant expansion of the badger population, with, in some regions a very high incidence of them having TB.

2.4 It is a catastrophe not only for farmers and their cattle but for the badgers as well.

3. TUBERCULOSIS-BTB

3.1 TB is an infectious disease of all mammals, including man, caused by bacilli (antigen), with a very long incubation period-time from first contact (challenge) to development of symptoms, of months or even years, depending on size of the challenge. Infection is usually by mouth or inhalation; the bacilli can also enter the body via open wounds and bites.

3.2 Once in, the bodies’ initial defence mechanism is the lymph glands. There are lymph glands scattered through out the body protecting all organs. The infected glands become enlarged-lesions; if the challenge is small then the glands will eventually return to normal. However with a larger challenge, then the body will attempt to wall off the infection by forming an abscess or abscesses. This process in cattle takes at least four to six weeks.

3.3 At the same time the bodies’ immune system produces antibodies to the bacilli (antigen). In cattle this process again takes at least four to six weeks.

3.4 With a low challenge the animal will win the battle and the antibody level will fall. With a high challenge or a frequent one, the bacilli will via the blood stream and enter any organ of the body; usually the lungs, liver or kidneys, because they act as filters. Once there multiple abscesses develop and the animal will become ill. It is at this stage when it becomes infectious to other animals (open infection).

4. TB-BADGERS

4.1 Badgers can live for over three years with TB. For the first two or more years they appear healthy and are capable of breeding etc It is only in the last six months of their lives that they actually become ill and suffer before they eventually die of starvation. For at least two years the badgers are infectious. They excrete bacilli in their saliva and over 1,500,000 bacilli in every teaspoonful of urine, which they are continually dribbling out to contaminate the environment.

4.4 The assumption is then made because badgers do not become ill, they therefore cannot suffer when they have TB.

4.5 Ill badgers, unable to carry out their normal “sett duties” are expelled and go into “sheltered accommodation” often in or near farm buildings, stacks of hay or straw, and drink from cattle troughs which they will contaminate.

5. TUBERCULIN TEST

5.1 The tuberculin test is the internationally acknowledged test for identifying TB reactor cattle.

5.2 It was the only test that eradicated TB from our herds in the 1950 and '60s. The test has kept Europe and Australia clear.

5.3 It is a comparative test which involves injecting the “cow” at two different sites into the skin in the neck, with a controlled amount inactivated TB—an antigen. The animal if it has developed antibodies to TB, reacts by producing a swelling at the injection site. 72 hours later the reaction—swelling—if any is measured and the consistency noted.

5.4 The result of the test is decided by the difference in size of the swellings.

5.5 The test is claimed to be 98+% accurate—a positive indicates that the animal has almost certainly been challenged at least a month previously.

5.6 It is claimed that the test is only 80+% accurate in identifying all those that have been challenged, even those that have lesions.

6. BLOOD TEST

6.1 This “new” blood test was on trial as a complimentary test to the established tuberculin test. It was inevitable that the trial would fail and it has now been withdrawn.

6.2 The test is expensive both in man power and lab fees. The test is too sensitive, which results in far too many being slaughtered as reactors. The intention to remove those few cattle that the tuberculin test missed was theoretically a good idea. It however did not make any allowance for re-infection from the reservoir of infection that exists in the badger population. All my clients whose cattle underwent the test have since lost yet more cattle and are still losing them.

6.3 The blood test would only be of use were there NO external reservoir of infection.

7 HERD BREAKDOWN

7.1 It is not unusual, at the first herd test when reactors are found there are no visible lesions found at post mortem. At the subsequent 60 day test the cattle might go clear only to react again at the six month test, when even more reactors are found. This process can be repeated for several years until finally lesions are found. Clients have lost 50 to 60 cattle before lesions are found. They may have a reprieve for six months before having still more reactors.

7.2 Because there are no visible lesions at tests farmers claim that their cattle do not have TB and that the test is wrong. NO—it is an indication that those animals have had a challenge, and that the testing is ahead of the game (disease).

8. SCIENCE

8.1 Research scientists accumulate as much information—data—as they can about their subject; this data can then “cherry picked” by statisticians to produce the result suitable for their source of finance or in the case of controversial subjects to satisfy their supporters. The result is “science”.

8.2 Science itself is self perpetuating. The more one looks the more one finds and the less one knows. It appears that for some research scientists who depend upon external funding it would be in their interests to prolong the process?

8.3 It is a very sad state of affairs but no “scientific” claim, particularly if controversial can be taken at face value.

9 THE KREB'S TRIAL

9.1 The trial was set up to establish the link, if any of badger involvement in the transmission of TB to cattle.

9.2 The trial under Professor Bourne was doomed from the very start.

9.3 At the launch farmers' meeting in Leominster, in answer to a question Bourne stated that “I will make allowances for any interference by the ‘badger groups’ to the trial”!

9.4 Why were the dates and sites of trapping posted on the web site??

9.5 The trial was inevitably sabotaged—traps being wrecked, badgers relocated and those directly involved were intimidated. How many arrests were there? What happened to the badgers in the traps?

9.6 The trial was designed by those with minimal knowledge of basic badger behaviour and was very poorly executed. Trapping only took place for a few days at a time.

9.7 There was no way that sufficient numbers of badgers would be culled. Who could have designed a culling trial which stopped for the breeding season? Trapping only took place for a few days at a time and during December when the weather would be fickle and badger activity minimal.

9.8 The trapping was so inefficient that only 30 to 60% of the guesstimated badgers were culled.

9.9 No account was taken that the ill badger, having gone into “sheltered accommodation” would not be on the trappers’ target; they would only be trapping the healthy badgers.

9.10 I would have expected at least a year between an efficient cull for there to be any significant improvement in the cattle TB numbers. This lag will also allow for those in sheltered accommodation to have died.

9.11 The number of TB reactors in the hot spot areas, including in the proactive trial area has in the last few months reduced. This is no doubt to the death of the ill badgers together with the culling. There is also less evidence of badger activity in the area.

9.12 The reactive cull was, in some cases did not start until six + months after the TB breakdown. This is intolerable.

9.13 At the Independent Scientific Group open meeting in November 2004 one of the statisticians referring to the termination of the reactive cull said “we put in all different combinations of data and were unable to come up with a different answer”!!

9.14 The Krebs trial found that both in the reactive cull and the proactive one there was a decrease in the number of breakdowns within the two areas, but an increase in the number of breakdowns around the perimeters. This was put down to perturbation (disturbance to you and I). At least it demonstrates beyond all reasonable doubt, that the badgers have a definite role in the transmission of TB to cattle.

9.15 The science of the Krebs trial is so flawed that little value can be put on the findings.

10. THE INDEPENDENT SCIENTIFIC GROUP (ISG)

10.1 The ISG, chaired by Professor Bourne would, I hoped, have been impartial. Not so, in September 2004 Bourne told a Committee of MPs that it was cattle to cattle movements that were responsible for transmission. He told me the same at his open meeting November 2004.

10.2 At the January 2006 meeting we were told by one of the group, that not many badgers die from TB! She had not found many dead badgers. It is only commonsense, that a terminally ill badger is not going to die out in the open. Any one making such a statement deserves minimal credibility.

10.3 At the November 2004 meeting a report on an experimental research project was given. Professor Bourne was asked if it had been peer reviewed. Peer review is the scrutiny, by anonymous, independent specialists on the subject. Bourne just waived his arm at his group and said “I think they are well enough qualified to say the report had been peer reviewed”.

10.4 Bourne claimed in September 2004 when discussing movement of cattle with MPs, that there is no such thing as a closed herd. A closed herd, is usually a pedigree herd where no cattle have been purchased—they are self contained, for years. Occasionally every five or more years a bull might be purchased to introduce fresh blood. There might be fewer closed herds than there used to be, because they too have been ravaged by TB.

10.5 In the 1950s and '60s a double fence six foot apart was all that was necessary to protect your cattle from your neighbours. Now no herd is safe.

Bourne has rubbished the successful Tuberculin test, rubbished the successful Thornbury cull, and rubbished the successful Irish culls, yet still defends his own failed trial.

10.6 Professor Bourne stated “that any action must be taken on the back of good science”. If this was tempered with commonsense then the correct action—a cull would follow. Unfortunately, the science in the Krebs trial is so seriously flawed and there was certainly no commonsense applied, there is minimal sound evidence on which to plan a solution.

10.7 I find it despicable that under pressure from his critics, Professor Bourne has resorted to writing to the main stakeholders in the Government’s current Consultation exercise informing them that cattle movements are the cause of the current crisis.

10.8 Bourne has graciously acknowledged that “there is no doubt that badgers are implicated in the transmission of TB to cattle. Because of the effect of perturbation, any cull to be effective, would have to be over a very large area”. (So much for the Krebs trial.) “Since such a large cull would not either be socially or politically acceptable, financially affordable or sustainable, then a cull is not an option”.

10.9 Bourne having failed the Krebs trial, deliberately diverts attention away from the badgers and blames cattle to cattle infection and cattle movements, for the TB.

11. CATTLE TO CATTLE TRANSMISSION

11.1 Bourne claims that all cattle that have been challenged with the bacilli are potentially infectious and has stated that “there are a lot of cattle with undetected TB out there”.

11.2 This transmission, unless infection in the herd is long standing, just does not occur in the field. If it did then how did we eradicate TB from our herds in the '50s and '60s?

12. CATTLE MOVEMENTS

12.1 There are incidents where cattle movements have been directly responsible for outbreaks of TB. When farmers were restocking, post Foot and Mouth TB was taken North to herds in Cumbria. At their 60 day herd re-establishment test these cattle were identified and culled. A few herds had reactors at the subsequent 60 day test, others went clear. I understand that virtually all these herds were clear within a year and have remained clear since because there is no external reservoir of infection in the wild life.

12.2 On farms where there were reactor cattle prior to foot and mouth, on restocking six months later with “TB free” cattle, some of these cattle subsequently became reactors.

12.3 Analysis of the outbreaks locally indicate that 70% are beyond all reasonable doubt due to badgers. The majority of the others the cattle have come from herds with a previous history of badger related outbreaks.

13. CONCLUSION

13.1 It is beyond all reasonable doubt that TB infected badgers are by far the most significant reservoir of infection for our cattle.

13.2 Professors do NOT have a monopoly of knowledge; statisticians in their ivory towers should not be able to influence those in the field.

13.3 The solution must be a clinical one and not be one of consensus. The only solution is a cull of the reservoir host.

13.4 An efficient cull will not only benefit the cattle population but the badger population too.

14. THE CULL

14.1 Any cull must be humane and cost effective.

14.2 The handling and disposal of the badger carcasses and the financial cost involved must be taken into account.

14.3 Trapping has a high initial capital cost, together with high manpower requirements. The badgers have to be culled and disposed of. It is not a very efficient method, as demonstrated in the Krebs trial.

14.4 Snaring—Completely indiscriminate any other animal can be snared. Snares have to be inspected frequently—the badger will suffer severely. Snares have to be anchored to a secure object; not available in the open or when there is little or no soil-stony/rocky ground.

14.5 Shooting—Shooting involves specialist man power, and has a high risk of injury to the badger; never mind the safety of those in the vicinity. Shooting would only be efficient at night when the nocturnal badgers are active.

14.6 Frequent shooting would also be an obnoxious stimulus to the badgers causing a behaviour change.

14.7 Poisoning is again indiscriminate having multiple species as target.

14.8 Gassing the badgers in their setts with carbon monoxide is by far the best option. Carbon monoxide acts like an anaesthetic in that the animal just quietly becomes unconscious and dies. There is no suffering. All the occupants of the sett will die. There is no problem with disposal of carcasses. Exhaust fumes from any vehicle are suitable.

14.9 Culling must be left to the farmers, who have the incentive, unlike official cullers, to do undertake the work.

14.10 I am concerned that if licences are required, who is going to issue them, and who is going to “vet” them. If there is any publicity then the farmers will be liable to intimidation by the “badger groups”.

February 2006

Memorandum submitted by British Association for Shooting and Conservation (BASC) (BTB 21)

EXECUTIVE SUMMARY

1. Written response of the British Association for Shooting and Conservation (BASC) to the Environment, Food and Rural Affairs Committee inquiry in to the Defra consultation on *Controlling the Spread of Bovine Tuberculosis in Cattle in High Incidence Areas in England: Badgers*.

2. The Government will decide whether culling badgers is the most appropriate method for controlling bovine TB and is seeking comments on three methods of culling namely shooting, snaring and gassing.

3. BASC supports and actively promotes humane predator and pest control and have wide experience in providing and delivering best practice guidance to practitioners.

4. BASC supports a range of culling methods being made available to land managers to enable them to assess which method or methods are most appropriate for their particular set of circumstances.

5. SHOOTING OF FREE RUNNING BADGERS

5.1 Night shooting is a well-trying, safe and humane method of fox control used by gamekeepers and other land managers, which could be extended to control free running badgers.

5.2 Badgers may be shot within the terms of an appropriate license using firearms and ammunition that comply with the Protection of Badgers Act 1992.

5.3 Potential licensees wishing to use firearms will need to apply to their police firearms licensing department for an appropriate variation on their firearm certificate to control badgers.

5.4 BASC supports the proposal for a close season for badgers extending from 1 February to 31 April to avoid shooting lactating sows with dependant cubs.

5.5 Under the Wildlife and Countryside Act 1981 the following are prohibited:

- (a) the use of an automatic or semi-automatic weapon to kill a badger;
- (b) any device for illuminating a target or sighting device for night shooting, and any form of artificial light to kill a badger; and
- (c) use any mechanically propelled vehicle in immediate pursuit of a Schedule 6 animal, which includes a badger, for the purpose of driving, killing or taking it. Without legislative changes the night shooting of badgers would remain illegal.

6. BODY SNARES

6.1 Where night shooting is not feasible snares offer an effective and humane alternative. Badgers are largely nocturnal and predictable in their habits:

6.2 The consultation paper refers to the use of “body snares” for catching badgers, as opposed to the neck snare currently used in England for catching foxes. This new type of snare will therefore be unfamiliar to operators and the methodology used is fundamentally different from that used to catch foxes.

6.3 Snares used for catching badgers would need to be constructed differently from fox snares.

6.4 The Wildlife and Countryside Act 1981 requires snares to be inspected at least once every day, however, snares used for badgers could be inspected at relatively shorter intervals throughout the hours of darkness, for example three to four hours after setting.

6.5 Badgers caught in snares would be despatched quickly and humanely by a shot from a rifle, shotgun or pistol.

6.6 BASC recommends that where snaring is permitted under license to control badgers it should be carried out in accordance with an agreed, dedicated code of practice.

7. GASSING

7.1 Gassing should be considered as one of a range of methods which could be made available to land managers, however, there are currently no compounds licensed for use in the UK other than for the control of moles, rats and rabbits.

7.2 BASC supports current research in to the use of carbon monoxide to control badgers.

8. CARCASS DISPOSALS

8.1 The culling of badgers to prevent the spread of bovine TB will be an action sanctioned by Government therefore carcass disposal and any associated cost burdens must be met by the State and not transferred to licensees.

8.2 Bovine TB is a notifiable disease. The appropriate statutory agency should be responsible for organising appropriate training, delivery of equipment for the safe collection and storage of carcasses on site and for the collection and disposal by incineration in approved establishments.

SUBMISSION

The Government is undertaking a consultation on *Controlling the Spread of Bovine Tuberculosis in Cattle in High Incidence Areas in England: Badgers*. The Environment, Food and Rural Affairs Committee are seeking comments on the key questions the Ministers must address in reaching conclusions on the issues set out in the consultation paper. BASC welcomes the opportunity to comment.

1. ABOUT BASC

BASC was founded in 1908 as the Wildfowlers Association of Great Britain and Ireland and is the UK's largest shooting association. BASC is constituted as an Industrial and Provident Society and has a membership in excess of 123,000. BASC is the representative body for sporting shooting in the UK. It aims to promote and protect sporting shooting and the well being of the countryside throughout the UK and overseas. It actively promotes good firearms licensing practice, training, education, scientific research and practical habitat conservation. BASC believes that all who shoot should conduct themselves according to the highest standards of safety, sportsmanship and courtesy, with full respect for their quarry and a practical interest in wildlife conservation and the well being of the countryside.

1.1 BASC's expertise in shooting matters is widely recognised and it is routinely consulted by a variety of government departments and agencies (including the Home Office, Defra, LANTRA, The Health and Safety Commission) and other statutory and non-statutory bodies.

1.2 BASC is a registered assessment centre for the Deer Management Qualifications (DMQ) offered by Wild Deer Management Qualifications Limited in association with the leading organisations involved in the deer industry in the United Kingdom. The Deer Management Qualification is a practical assessment standard, which includes coverage of game meat handling issues and is used as a basic bench mark for both professional and part time deerstalkers.

1.3 BASC's comments are set out below and we have only commented on those aspects of the consultation that we consider relevant to our membership and the wider shooting community. We will of course be happy to discuss any aspect of our response further, should it be required.

PROPOSED METHODS OF CULLING

The Government will decide whether culling badgers is the most appropriate method for controlling bovine TB and is seeking comments on three methods of culling namely shooting, snaring and gassing. BASC supports and actively promotes humane predator and pest control and has wide experience in providing and delivering best practice guidance to practitioners.

BASC supports a range of culling methods being made available to land managers to enable them to assess which method or methods are most appropriate for their particular set of circumstances.

2. SHOOTING OF FREE RUNNING BADGERS

2.1 Night shooting is a well-tryed, safe and humane method of fox control used by gamekeepers and other land managers, which could be extended to control free running badgers. In 1996 BASC produced a code of practice on the night shooting of foxes, commonly known as "lamping", which is widely regarded as the standard by which lamping should be carried out. The code is also circulated by a number of police firearms licensing departments with shotgun and firearms certificate renewal forms.

2.2 Badgers may be shot within the terms of an appropriate license using firearms and ammunition that comply with the Protection of Badgers Act 1992. That Act specifies a shotgun of not less than 20-bore, or a rifle firing ammunition with a bullet weight of not less than 38grains and generating a muzzle energy of not less than 160 ft/lb. Centre fire rifles such as the .22 Hornet, .222Rem, .223, 243Win and .22-250 are commonly used for fox control and are well within the limits required by the Act for the control of badgers.

2.3 A 12 bore shotgun with a load of not less than 36 grams of large shot such as No 1 or No 3 would be an effective alternative to a centre fire rifle at short range, up to 30 meters. The use of an automatic or semi-automatic weapon to kill a badger is prohibited under the Wildlife and Countryside Act 1981. Consideration would therefore need to be given as to whether their use would be permitted under license.

2.4 Under the Wildlife and Countryside Act 1981 any device for illuminating a target or sighting device for night shooting, and any form of artificial light to kill a badger, or attempt to kill a badger, is illegal. These devices are an integral part of lamping therefore measures will need to be put in place to permit their use under license.

2.5 Potential licensees wishing to use firearms will need to apply to their police firearms licensing department for an appropriate variation on their firearm certificate to control badgers. Currently a “good reason” for allowing someone to possess a rifle is “vermin control” which means fox and rabbit control or for larger centre fire calibers, controlling deer. Given this are badgers to be classed as “vermin” thereby requiring no variation to an existing certificate or would licensees need to specify badger control as a new and separate activity?

2.6 Will all police firearms licensing departments in England be contacted by Defra to make them aware of any proposed changes firearm certificates holders would require in order to meet the new requirements?

2.7 If the Government requires badgers to be culled by licensees using centre fire rifles (or by shotgun) is the Government proposing to compensate license holders for variations and amendments to current certificates holders or for the granting of new certificates? The current cost of a renewal is £40 and a grant £50.

2.8 Under the Wildlife and Countryside Act 1981 it is illegal to use any mechanically propelled vehicle in immediate pursuit of a Schedule 6 animal, which includes a badger, for the purpose of driving, killing or taking it. Lamping usually takes place from the back of a stationary vehicle. BASC therefore seeks assurances that the use of vehicles would be permitted under any license conditions otherwise lamping, as a control method, would be severely restricted.

2.9 BASC supports the proposal for a close season for badgers extending from 1 February to 31 April to avoid shooting lactating sows with dependant cubs, however, provision needs to be made to enable control to be carried out during this period should it be deemed necessary.

3. BODY SNARES

3.1 Where night shooting is not feasible snares offer an effective and humane alternative. In 1994 BASC produced a code of practice on fox snaring, which is widely regarded as the standard by which fox snaring should be carried out. We note the consultation paper refers to the use of “body snares” for catching badgers, as opposed to the neck snare currently used in England for catching foxes. This new type of snare will therefore be unfamiliar to operators. Also the methodology used for catching badgers in body snares would be fundamentally different from that used to catch foxes, such as the height of setting and anchorage, though some techniques would be applicable.

3.2 The majority of people using snares within the UK will have had little formal training. A mentor would initially teach snaring techniques and people quickly become proficient through experience. Gamekeepers in particular use snares regularly and have the necessary skills required to carry out the task to a high standard.

3.3 Experience of snare use combined with a good knowledge of the tracks, trails and signs of both target and non-target animals are essential elements to successful and humane snaring. Awareness raising through recognised codes of practice play a major role in ensuring snares are used responsibly and helps minimise the capture of non-target species⁷. BASC is not aware of any reliable evidence to suggest that snares are being routinely misused or that the accidental capture of non-target species poses a significant threat.

3.4 BASC recommends that where snaring is permitted under licence to control badgers it should be carried out in accordance with an agreed, dedicated code of practice.

3.5 Snares used for badgers would need to be made from strong multi-strand steel cable. For example, BASC’s fox snaring code of practice recommends wire with a breaking strain of not less than 460lbs/208 kilos. Snares must also be “free running”, incorporate a swivel to prevent the cable from twisting and fitted with a crimped “stop” to prevent the loop closing completely. Snares must also be free of any sharp or frayed edges, which might cause injury.

3.6 A free running snare is a wire loop that relaxes when the animal stops pulling, whilst a self-locking snare is a wire loop that continues to tighten by a ratchet action as the animal struggles. Free running snares are used to restrain an animal not kill it. The Wildlife and Countryside Act made self-locking snares illegal in 1981.

3.7 Snares would need to be firmly anchored in the ground and set in open sites. Sites cluttered by obstacles such as saplings, fences or gates, which increase the risk of injury and entanglement, should not be used.

3.8 A badger caught in a free running snare would be despatched quickly and humanely by a shot from a rifle, shotgun or pistol.

3.9 The Wildlife and Countryside Act 1981 requires snares to be inspected at least once every day. BASC's fox snaring code of practice recommends snares are inspected at least twice a day and as soon after dawn as is practicable. The 2005 Defra Code of Good Practice on the Use of Snares for Fox and Rabbit Control, developed by the Independent Working Group on Snares of which BASC was a member, recommends that during the winter snares must be inspected as soon after sunrise as is practicable, and should again be inspected near dusk. In summer snares must be inspected before 9 am, and a further inspection should be conducted in the evening.

3.10 Badgers are largely nocturnal and predictable in their habits. Capture is likely soon after dusk when they are on their way from the sett to feeding areas and again on their return. Snares set for badgers could therefore be set as late in the daytime as possible on well defined badger runs which minimises the risk to any non-target species and inspected at relatively shorter intervals throughout the hours of darkness, for example three to four hours after setting.

3.11 Given the need for a different approach to be taken when snaring badgers BASC would wish to discuss further whether license holders would require additional skills, obtained on a voluntary basis and at no cost to themselves, if snaring is deemed an appropriate method of control.

3.12 A number of shooting organisations and pest control companies currently offer voluntary training courses on predator and pest control at various locations throughout the year.

3.13 The introduction of any compulsory training scheme to meet Government proposals may require many thousands of people to undertake training even though they may only occasionally use snares and would be unfairly penalised. Compulsory training schemes tend to be both bureaucratic and costly which may preclude many people from participating. Compulsory testing should only ever be an option when evidence clearly shows widespread abuse or misuse. Given the lack of any reliable evidence to suggest this then there is little justification, at present, for compulsory training.

4. GASSING

4.1 Gassing should be considered as one of a range of methods which could be made available to land managers, however, there are currently no compounds licensed for use in the UK other than for the control of moles, rats and rabbits. BASC notes reference to the use of carbon monoxide in the consultation paper and supports current research in to its possible use to control badgers.

4.2 Operators currently using pesticides including gassing compounds for controlling moles, rats and rabbits are required to have had appropriate training. Should carbon monoxide or any other gassing compound become available to control badgers BASC would wish to discuss further whether license holders would require additional skills, obtained on a voluntary basis and at no cost to them, if gassing was deemed the most appropriate method of control.

4.3 A number of existing training providers such as ADAS are already delivering training within the agricultural/land-based sector in the safe use of pesticides.

5. CARCASS DISPOSALS

5.1 Bovine TB is a notifiable disease. The culling of badgers to prevent the spread of bovine TB will be an action sanctioned by Government therefore carcass disposal and any associated cost burdens should be met by the State and not transferred to licensees. The appropriate statutory agency should be responsible for organising appropriate training, delivery of equipment for the safe collection and storage of carcasses on site and the collection and disposal by incineration in approved establishments.

February 2006

Memorandum submitted by Cornwall Badger Group (BTB 22)

1. Eminent scientists including the governments own Independent Scientific Group on Cattle TB (ISG) and Defra's Science Advisory Council (SAC) have already questioned the content of the "Consultation on controlling the spread of bovine tuberculosis in cattle in high incidence areas in England: badger culling".

2. DEFRA claim that this "aims to explain the issues and involve the wider public in the process to decide whether or not to cull badgers . . ."

3. But just how public is this process? DEFRA have confirmed to me that there was an announcement in Parliament followed by a press release, but subsequently they have relied on media response and the efforts of charities and individuals to facilitate public participation. There seems to have been no effort by DEFRA to explain that we can have our say either by writing to: Bovine TB and Badgers Consultation, Defra, 1a Page Street, London SW1 4PQ; or (preferably) by e-mailing: bTB.consultation@defra.gsi.gov.uk—before 10 March closing date.

4. Perhaps Defra's political masters, including Margaret Becket and Ben Bradshaw, could explain why so little effort seems to have been made to involve the public in this unique opportunity to express their feelings?

5. And perhaps Tony Blair, whose government seems so keen on "public consultation" could explain why no systems have been set up nationally to simplify our participation by, for example, providing an interactive website such as has been done privately at www.stopthecull.info for the current DEFRA consultation?

February 2006

Memorandum submitted by the Tenant Farmers Association (BTB 23)

BOVINE TB: BADGER CULLING

INTRODUCTION

1. The Tenant Farmers Association welcomes the opportunity of providing written evidence to the Environment, Food and Rural Affairs Committee as part of its enquiry into badger culling as part of a bovine TB control strategy. The TFA has in the past provided evidence to the Select Committee on this subject and our evidence here will be consistent with the messages we have been providing to the Committee and to DEFRA over a long number of years. This issue is of immense importance to the livestock industry. We should not underestimate the level of stress, anxiety and cost that have been faced by farm businesses in recent years who are forced to watch their cattle be slaughtered due to TB whilst being seemingly powerless to do anything about it.

2. The Committee will be aware that the TFA represents the interests of those who do not own their farms and therefore the capital base of their businesses rests in their live and dead stock. Bovine TB is therefore an extremely significant issue for the tenanted sector given the contribution that cattle values make to the net worth of individual tenant farmers.

THE PRINCIPLE OF BADGER CULLING

3. The Tenant Farmers Association believes it to be essential that badgers infected with TB should be culled. Farmers struggle to do their best to keep disease away from their herds but are frankly fighting a losing battle given the extent to which disease is freely moving amongst badgers and other species of wildlife. No-one wishes to interfere unduly with an indigenous species of wildlife, however, badgers are rapacious carnivores with no known natural predator. Their numbers have increased significantly over the past 10 years and the incidence of TB in badgers has also increased significantly. The TFA believes that a cull of infected badgers is long over due. The TFA has for a long time questioned the validity of bio-security measures alone in controlling TB. Badgers are unfortunately extremely effective in climbing into feed and water troughs and getting into feed stores. There is also little that can be done to stop cattle coming into contact with badgers in fields or the excretions that badgers leave behind. The Tenant Farmers Association wishes to see a healthy cattle population alongside a healthy badger population.

OPTIONS FOR A BADGER CULLING POLICY

4. It would seem to make sense to license individual farmers to control badgers on their holdings and on neighbouring units. Of course, any licensing procedure must involve the provision of guidance to licence holders as to how culling should be conducted. The TFA believes that such an approach would be the most cost effective method of ensuring that infected badgers were dispatched and with proper guidance it should be possible to ensure that such activities are carried out humanely.

5. The TFA's view is that all infected badgers should be culled but that process should start with infected badgers within six-miles of farms which have had a TB breakdown within the last 12-months. In order to identify infected badgers, the TFA believes that more work should be done on polymerase chain reaction (PCR) technology as this is very close to providing a reliable live test for disease incidence in wildlife. However, the TFA recognises that this will take some time to develop and in our view a badger control policy cannot wait until the full development of PCR technology. Inevitably the TFA accepts that some healthy badgers will be taken alongside those which are infected. This is not our intention but it appears to be an unavoidable consequence of the need to take action now.

6. Licence holders will need to demonstrate that they have sufficient equipment, skill and resources to carry out the necessary culling and that they have a good relationship with neighbouring farmers in their area to enable co-ordination to be as smooth as possible.

METHODS OF CULLING

7. The TFA believes that the only humane method for culling infected badgers should be gassing with carbon monoxide. The TFA does not support trapping or snaring. The TFA would be very concerned about other species of wildlife being caught in snares or traps and also concerned about the animal welfare implications of snaring in general.

8. Given this position, it will be essential for any guidance to licence holders to cover the appropriate use of carbon monoxide to ensure effective and humane control of infected badgers in setts.

DEFRA'S CONSULTATION

9. The TFA is appalled that DEFRA has consulted on options which the Independent Scientific Group (ISG) on bovine TB has long since discounted. The ISG felt so strongly about the misleading nature of the consultation document issued by DEFRA that it wrote out to all recipients of the consultation document to clear up the confusion. This leads the TFA to conclude that DEFRA is not taking this issue sufficiently seriously. The TFA is gravely concerned that the consultation is being used as yet another smokescreen for inaction.

10. When asked at the most recent open meeting of the ISG if it would be possible to control bovine TB by cattle controls alone and without any control in wildlife, Professor Bourne, the Chairman of the ISG gave a one word answer—"No". The TFA now wants DEFRA to act on this scientific view and delay no further in introducing a cull of infected badgers.

11. It is clear from the work of the ISG that to be effective, any culling of badgers would have to be carried out over wide areas (at least 300 km square). This is the clear scientific view and it should now be implemented by DEFRA starting with those areas within six miles of herds that have had TB reactors in the last 12 months. The Government must also put in place the necessary legal framework to gain consent for access to land for this culling where it is not provided voluntarily.

12. The TFA cannot understand what extra research is needed on the issue of gassing. It is already a tried and tested means of controlling badgers and again the TFA believes that this is yet just another device for delay.

CONCLUSION

13. Bovine TB is costly to both industry and Government. We believe that the Government has allowed bovine TB to rage out of control for a number of years. We are deeply disappointed that we have yet another consultation process rather than firm action on control of bovine TB within wildlife. However, if this leads to swift action along the lines outlined above, then the TFA is prepared to wait the few extra weeks that will be required for the consultation exercise to take place. However, if this becomes yet another smoke-screen for inaction, as we believe it is, then the consequences would be extremely damaging indeed.

February 2006

Memorandum submitted by Wildlife and Countryside Link (BTB 24)

1. Wildlife and Countryside Link (Link) brings together voluntary organisations concerned with the conservation, enjoyment and protection of wildlife, countryside and the marine environment. Our members practice and advocate environmentally sensitive land management and food production practices and encourage respect for and enjoyment of natural landscapes and features, the historic environment and biodiversity. Taken together, our members have the support of over eight million people in the UK and manage over 476,000 hectares of land. This statement is supported by:

- (a) Badger Trust
- (b) Royal Society for Prevention of Cruelty to Animals
- (c) Royal Society for the Protection of Birds
- (d) The Wildlife Trusts
- (e) Woodland Trust
- (f) World Society for the Protection of Animals

2. Link welcomes the Environment Food and Rural Affairs Committee's inquiry into the Government's consultation on badger culling. In particular, we welcome the Committee's intention "to focus on the key questions that Ministers must address in reaching conclusions on the issues set out in the consultation paper".

3. Link has identified a number of fundamental issues that it believes need to be addressed.

4. ANY BADGER CULLING POLICY NEEDS TO BE FOUNDED UPON SOUND SCIENCE

(a) Link notes the issues raised by the Independent Scientific Group (ISG) who have expressed their concern that their advice has not been incorporated and warned that the consultation document is “inaccurate in important respects”, strongly suggesting that it is not based on sound science.

(b) The independent advice of the Chief Scientific Advisor’s Science Advisory Council (SAC) also appears not to have been taken into account by Defra in drawing up the proposals. For example, the SAC have advised that cattle-to-cattle transmission is the dominant transmission factor regarding bovine TB in Great Britain and that culling badgers is unlikely to be an effective control measure unless and until further cattle based measures have been implemented successfully.

(c) Disease modelling work by the ISG has indicated that relatively modest improvements either in TB test performance or TB testing frequency would be sufficient to bring an epidemic under control. However, there appear to be no proposals to investigate the policy implications of such an approach.

(d) The impression is therefore of consultation proposals being put forward despite the initial results and before completion of the Randomised Badger Culling Trial (RBCT), other scientific evidence and independent scientific opinion. Link believes that this raises serious questions over Defra’s interpretation of science when planning policy developments.

(e) Link notes that Defra makes no proposal for a “Plan B” involving strategies other than culling badgers, strongly suggesting a lack of strategic thinking or that a decision to cull has already been made, or both.

5. ANY BADGER CULLING POLICY REQUIRES THOROUGH RISK ASSESSMENT AND A ROBUST ASSESSMENT OF ITS FEASIBILITY AND ECONOMIC VIABILITY

(a) Link suggests that the EFRA Committee request clarification from Defra whether a risk assessment of the proposed badger culling strategies was made together with a study of the feasibility of implementation.

(b) Link believes that before proceeding to full consultation, an updated cost benefit analysis on badger culling, taking into account the initial results of the RBCT, should have been received by Defra and made available as part of the public consultation.

(c) Given that a cost benefit analysis of badger culling options has been undertaken by Defra, Link believes that a similar comparative cost benefit analysis of other measures, including vaccination of cattle and/or badgers, to minimise the risk of transmission from badgers to cattle should also have been commissioned.

6. ON IMPLEMENTATION, ANY POLICY MEASURE SHOULD BE MONITORED AND ASSESSED THROUGH ROBUST SCIENTIFIC AND ECONOMIC STUDIES

(a) Link would welcome further information on how Defra will distinguish between the costs and benefits of controls on cattle compared with the control of badgers, if both policies are implemented simultaneously.

(b) Link has a number of concerns as to how Defra will monitor whether licences for culling badgers are fully implemented and whether the licence conditions are adhered to.

(c) Link has a number of concerns as to how pre-movement testing will be monitored and enforced by Defra.

7. ANY CONTROL OF BADGERS WILL NEED TO COMPLY WITH NATIONAL AND INTERNATIONAL LEGAL OBLIGATIONS ON BOTH ANIMAL WELFARE AND SPECIES CONSERVATION

(a) Link is concerned that Defra has proceeded with a consultation on culling strategies without providing information on key aspects including: (i) the proportion of Britain’s badgers that the Government is proposing would be culled; (ii) the proposed number of badgers that would be culled; and (iii) the wider implications the culling strategies would have for nature conservation.

(b) Link suggests that the EFRA Committee ascertain as to whether Defra has applied for licences from English Nature to capture wild badgers to validate, in a controlled scientific study, the efficacy and welfare implications of different culling methods.

(c) Link remains unsure as to why Defra is proposing gassing or the use of body snares when much information to inform an assessment of such methods is still to be obtained and suggests that this clarification be requested by the EFRA Committee.

(d) Link would welcome further evidence on how Defra will ensure that animal welfare standards are maintained under the various culling strategies.

(e) Link would also welcome evidence as to how Defra will enforce animal welfare standards if they are not met, as we do not believe this is sufficiently addressed in the current consultation document.

(f) Link would welcome evidence as to how Defra will ensure the conservation status of the badger is not threatened by culling, as we do not believe this is sufficiently addressed in the consultation document.

February 2006

Memorandum submitted by League Against Cruel Sports (BTB 25)

EXECUTIVE SUMMARY

The League Against Cruel Sports considers that the scientific evidence shows overwhelmingly that badger culling should not be used as a strategy for the control of bovine Tuberculosis. Indeed, it is clear from the studies discussed in this document that culling can in fact serve to make a bad situation worse. The League is particularly concerned about the suggested use of snares as a culling technique, due to their cruel and indiscriminate nature. We urge the Government to focus its efforts on decreasing cattle to cattle transmission of bovine TB, and to steer well clear of an uneconomic and harmful badger culling strategy.

INTRODUCTION

1. The League Against Cruel Sports is a campaigning organisation dedicated to ending suffering and killing of animals in the name of “sport”. Throughout our 80 year history we have also been committed to the protection of British wildlife from cruelty, and are particularly active in regard to the plight of badgers. The League played a key role in campaigning successfully for badger protection legislation in the 1980s and 90s. Today, we campaign for a total ban on the use of snares, to which badgers often fall victim, and have closely followed the debate on badgers and bovine Tuberculosis. Our in depth knowledge of the subject area gives us the expertise to comment on the principles addressed in the consultation, as well as to discuss whether snares should be used in the event of a cull.

THE PRINCIPLE

2. In March 2005, the Government committed to “ensuring its policies on bTB are recognised as being soundly based on scientific evidence”.⁵ In May 2005, scientists at Oxford University published evidence to show that Cattle movements “substantially and consistently outweigh” all other factors (including badgers) in predicting outbreaks of bTB.⁶ In December 2005 the Independent Scientific Group, commissioned by DEFRA to investigate the influence of proactive culling on the number of TB breakdowns in cattle, published interim analyses which showed that not only did intense proactive culling only manage to reduce TB incidence within the culling area by 19% but it actually increased it by 29% in a 2km ring around the zone.⁷ Culling badgers made the situation worse. The reasons for this were made clear in a study published at the same time, which reported that culling disrupts badger territories making survivors roam more widely than usual.⁸

3. Of further concern is the fact that it takes badger social structures almost a decade to stabilise after disturbance,⁹ meaning that negative effects to both badger welfare and the control of TB are likely to continue for years after culling.

ECONOMY

4. Evidence cited in the consultation document supports the idea that badgers make a contribution to cattle infection, but openly recognises the contribution they make is not known. Nevertheless, the Partial Regulatory Impact Assessment published alongside the consultation document assumes that “about half of all confirmed TB incidents arise from badger-to-cattle transmission and that these can be reduced in proportion to the reduction in badger population” (annex B, paragraph 48). What is made less clear is how vulnerable the RIA is to changes in this assumption. If, as suggested by evidence from the Randomised Badger Culling Trials, the actual figure was lower than 50%, it is hard to see how any badger culling strategy could ever be cost effective. This concern has been voiced by ISG economist Professor John McInerney, who said “There are much more economically effective activities you can try before you take this automatic jump into badger culling”.¹⁰

⁵ Government strategic framework for the sustainable control of bovine TB in Great Britain page 36, March 2005.

⁶ Gilbert *et al*, 2005 Cattle movements and bovine tuberculosis in Great Britain, *Nature* 435, 491–496.

⁷ Donnelly, C *et al* (December 2005) Positive and negative effects of widespread badger culling on tuberculosis in cattle, *Letters, Nature*.

⁸ Woodroffe, R *et al* (December 2005) Effects of culling on badger *Meles meles* spatial organisation: implications for the control of bovine tuberculosis, *Journal of applied ecology*.

⁹ Cheeseman, C L, Mallinson, P J, Ryan, J and Wilesmith, J W (1993) In Hayden, T J (ed) *The Badger*, 78–93. Dublin. Royal Irish Academy. As cited by *Bovine TB strategy*, Badger Trust, December 2005.

¹⁰ Farming Today, BBC Radio 4, 26/1/06.

INTERNATIONAL EVIDENCE

5. Are the international examples referred to in the consultation transferable? While the consultation document cites a literature review of international evidence as demonstrating that “some form of intervention in the wildlife domain is necessary if bovine TB in cattle is to be controlled”, it neglects to mention that this study concludes that there is evidence “for transmission from herd to herd not involving badgers, both locally and over long distances. This, together with experiences from other countries, emphasises the need for effective and comprehensive control measures within the cattle population”. The report goes on to recommend research into strategies other than badger culling.

SNARING

6. In paragraphs 8 and 9 of the executive summary of the consultation document, the need for any culling policy to be “humane” is clearly recognised. The League Against Cruel Sports considers it impossible to cull “humanely” through the use of snares. Additionally, snaring involves a threat to other animals due to its indiscriminate nature.

7. The consultation document states that body snares would be used to capture and hold badgers. We are particularly concerned that a badger caught around the body will be able to reach its head around to chew at the snare wire, which can cause horrific mouth injuries. Regardless of whether the snare catches around the neck or body, there remain significant problems with snaring.

8. A badger caught in a snare will naturally struggle to free itself. Badgers are powerful animals, and these attempts can tangle the snare, sometimes causing it to lock tightly around the animal. According to the report of the independent working group on snares, animals caught in snares can suffer:

- (a) stress of restraint including frustration, anxiety and rage;
- (b) fear of predation or capture;
- (c) thirst, hunger and exposure;
- (d) stress of capture and handling before despatch¹¹;

9. The longer a badger is caught in a snare, the more potential there is for serious injury. Badgers caught in snares have been known to literally “fall in half” after sustaining wounds and pressure necrosis damage from snares.¹² Short snare inspection intervals may reduce the length of time for the suffering described above, but to make the restraint “humane”, snares would have to be constantly monitored, which would have a major impact on the cost benefit analysis—making snaring even less economic than it is already.

10. The capture of non-target animals is always a major problem with snaring. The partial regulatory impact assessment states that snaring would occur “primarily” at sett entrances (paragraph 35). Clearly it is intended that some snaring may occur away from sett entrances, therefore meaning that non badger captures will take place. It is worth noting that in regard to fox snaring, the independent working group on snares found that even with best practice it is very difficult to reduce the overall proportion of non-target animals caught in snares to below 40% in some environments.¹³ Non-target animals caught in body snares include foxes and small deer, particularly muntjac.¹⁴

11. Non target captures may also be an issue in snares set at badger sett entrances. Foxes commonly make their homes in badger setts,¹⁵ and would therefore be at risk from snares set there.

12. The release of incorrectly snared animals cannot be done safely, as non-target animals which “seem fine” may in fact have very serious injuries, such as pressure necrosis wounds, which do not become apparent for up to seven days after release. Les Stocker MBE HonAssocRCVS, St Tiggywinkles Wildlife Hospital, (founder of the Wildlife Hospital Trust, St Tiggywinkles, Europe’s first and the world’s busiest wildlife teaching hospital, and author of Practical wildlife care (Blackwell Publishing, second edition 2005), the standard reference on treating wildlife casualties) has expressed similar concerns on this issue.

ALTERNATIVES

13. Paragraph 112 of the regulatory impact assessment states that if there were a decision not to permit culling, this would lead to an increased enforcement requirement for the State Veterinary Service in relation to cattle surveillance and control measures for bTB, particularly pre movement testing. This suggests recognition that there is an alternative to culling, and that involves tighter controls on cattle.

¹¹ Report of the Independent Working Group on Snares, August 2005, page 50.

¹² Les Stocker MBE HonAssocRCVS, St Tiggywinkles Wildlife Hospital, Personal Correspondence.

¹³ Report of the Independent Working Group on Snares, August 2005, page 55.

¹⁴ Les Stocker MBE HonAssocRCVS, St Tiggywinkles Wildlife Hospital, Personal Correspondence.

¹⁵ Professor Stephen Harris, School of Biological Sciences, Bristol University—Personal Correspondence.

14. At the recent London Zoological scientific debate on badgers and bovine TB, deputy chair of the ISG and Head of Statistical Epidemiology at Imperial College London, Professor Christl Donnelly, spoke on alternatives to culling badgers.¹⁶ She stated that decreasing the mean rate of cattle movement between herds would decrease the transmission of bTB, and that if test sensitivity could be increased, even if only in a modest way, this could be sufficient to turn the current increase in TB incidents in cattle into a decrease. Professor Donnelly went on to say that modelling has shown a similar reversal in trend could be achieved by increasing testing frequencies from every 12 months to every 10 months.

15. In addition to better, more frequent testing, there are husbandry interventions that could improve the current TB situation in this country. These include limiting wildlife access to feed, and keeping cattle away from badger setts. Biosecurity measures such as the isolation of newly purchased cattle, and the avoidance of nose to nose contact between cattle of different herds could also reduce transmission. The cost of these measures for farmers could be addressed by Government grants, as suggested in the 2005 Badger Trust Bovine TB Strategy.

RURAL ECONOMY

16. The Regulatory Impact Assessment places no economic value on wildlife, biodiversity and public enjoyment of the countryside, all of which would be compromised by any culling of badgers, and the associated impact on the biodiversity of the countryside. The economic assessment of the costs and benefits takes no account of these wider issues. The potential for impact on the rural economy caused by changes in visitor patterns (such as during the Foot and Mouth Disease outbreak¹⁷), has not been considered, and neither has the impact of the negative publicity on farmers and Government departments involved in any cull.

SUMMARY

17. The scientific evidence on bovine TB points clearly to a policy that must address cattle movements, and should on no account involve culling badgers. The extent to which badgers contribute to cattle infection is not known, and culling trials have increased the disease in areas around cull sites. However, the Government continues, through their recent consultation, to give the impression that the way to solve the bTB crisis is culling badgers. We hope that the Government will heed the ISG's recent advice that the consultation is "inaccurate in important respects",¹⁸ and abandon it in order to focus on the key issue: cattle to cattle transmission.

February 2006

Memorandum submitted by the Country Land and Business Association (BTB 26)

EXECUTIVE SUMMARY

- (i) Bovine TB is a zoonosis and a notifiable disease. The EU requires its eradication.
- (ii) Survey work shows that one in seven badgers in hotspot areas is infected with bovine TB.
- (iii) Evidence, confirmed by Professor John Bourne, indicates that bovine TB will not be eradicated through the use of cattle measures alone. Culling to reduce incidence in wildlife populations is necessary.
- (iv) CLA seeks the eradication of bovine TB.
- (v) A full range of culling methods should be available. Flexibility of method will enable culling appropriate to the situation.
- (vi) Gassing should be introduced to that range of cull methods as soon as possible.
- (vii) Government must take overall responsibility for culling.
- (viii) Culling should take place across large areas to reduce perturbative effect.
- (ix) Cull areas should, where possible, have strong geographical boundaries to reduce perturbative effect.
- (x) Area licences should permit culling by trained and authorised people using specified methods.
- (xi) Cull areas should be focused on the hotspot areas of disease.
- (xii) There must be persistency of culling, beyond the initial period, to ensure effective control of disease.

¹⁶ London Zoo, 24 January 2006.

¹⁷ See for example *The Report of the Rural Task force: Tackling the Impact of Foot and Mouth Disease on the Rural Economy* DEFRA October 2001.

¹⁸ Letter from the ISG to Ben Bradshaw MP, 20 January 2006, as included in Badger Trust press release "Minister Challenged over Science Errors", 24 January 2006.

CLA SUBMISSION

1. The Country Land and Business Association (CLA) welcomes the opportunity to contribute to this inquiry which results from the Government's decision to consult on proposals for badger culling in order to control bovine tuberculosis (bTB). Although there are a number of questions posed within the consultation document, essentially these relate to three themes: is badger culling necessary? And, if so, how should it be done, and who should do it?

Is Badger Culling Necessary?

2. The CLA has no axe to grind with regard to the badger. Our sole aim is the control and ultimate eradication of bTB. It serves neither, nor our members, any purpose to seek culling of badgers if this will not lead to a decreased incidence and eventual eradication of disease. Such an aim is consistent with the need to control this disease for the sake of animal as well as human health. In the 1930s, prior to pasteurisation, *M. bovis* was estimated to cause about 2,000 deaths annually, accounting for around 6% of total human deaths due to TB.¹⁹ Globally *M. Tuberculosis*, closely related to *M. Bovis*, kills more people than any other infectious disease.²⁰ Recent reports of *M.bovis* in the human population of the UK²¹ make continued vigilance in the face of increased resurgence of bTB particularly necessary.

3. CLA is not afraid to call for increased cattle control measures if those can be shown to reduce incidence of disease, and indeed we have over the past year called on government to tighten cattle testing intervals nationwide, enable the provision of greater information from SVS on individual animal disease status for cattle bought and sold, and to encourage greater use of post-movement isolation and testing which will prevent spread of many diseases, not just bTB. These measures are based on the basic principles of disease control, and, would contribute greatly to a lowered incidence of disease. Regrettably, we still await government action on these points. We note, especially, the recommendation of the EU Task Force on bovine TB: that "in countries with bovine tuberculosis problems annual testing should remain the norm but more frequent testing would be desirable".²² Within England, despite the proposed introduction of pre-movement testing, for many areas testing intervals can be as long as four years. This, in a country where over 6% of herds are affected by bTB, and as many as 15% of herds in hotspot areas²³ are affected.

4. However, cattle herds will contract bTB even if there have been no movements onto the holding; where there is full biosecurity; where stringent isolation and testing have been adhered to. Cattle measures alone cannot control this disease. This is not our opinion; this has been confirmed by numerous scientists, including, most recently, Professor John Bourne at the recent meeting of the ISG.²⁴

5. Therefore whilst we advocate good practice, and whilst strengthening cattle measures might assist in reducing the incidence of bTB, reliance solely on cattle controls will neither eradicate bTB, nor eliminate it from wild populations which act as a reservoir of disease.

6. The latest RTA survey data²⁵ suggests that one in seven badgers (14% of the population) is infected with bTB. This is an underlying reservoir of infection, and contrasts strongly with data showing that in those same "hotspot" areas, 0.7% of cattle tested were infected with bTB. Given trial data which shows a low level of cattle to cattle transfer,²⁶ we too would conclude that bTB will not be effectively eradicated unless action is also taken to eradicate the disease in wildlife.

7. It is therefore disappointing that the current GB Strategy aims not for eradication of this notifiable zoonosis, but merely, its control. Yet the EU seeks the eradication of various diseases, including bovine TB, and operates Task Forces to monitor the eradication of these diseases from each Member State. The Bovine Tuberculosis Sub group recommends that where wildlife is affected with TB, that action should be taken "in tandem" with the "bovine TB eradication programme".²⁷

¹⁹ Krebs Report 1997.

²⁰ World Health Organisation: TB infection is currently spreading at the rate of one person per second. The disease kills more young people and adults than any other infectious disease and is the world's biggest killer of women. Each year, an estimated eight million to 10 million people contract the disease and about two million people die from it.

²¹ Robert M M Smith, Francis Drobniowski, Andrea Gibson, John D E Montague, Margaret N Logan, David hunt, Glyn Hewinson, Roland L Salmon, Brian O'Neill : *Mycobacterium bovis* infection, *United Kingdom*, Emerging Infectious Diseases, Vol 10, Issue 4, March 2004.

²² European Commission bTB Task Force report, *supra*.

²³ DEFRA, SVS stats December 2005.

²⁴ Professor John Bourne, ISG Meeting, 25 January 2006; Also: Irish Dept Agriculture, Food & Forestry—EU TB Task Force report June 2004.

²⁵ DEFRA—ISG stats as part of RBCT, released 3 August 2005—one in seven badgers within RBCT counties had bTB, assessed on basis of RTA data.

²⁶ Costello, E, Doherty, ML, Monaghan, ML, Quigley, FC, O'Reilly, PF: *A Study of cattle to cattle transmission of Mycobacterium bovis* infection, *Veterinary Journal*, 1998, May: 153 (3): 245–50.

²⁷ European Commission, Summary report for the first year (2000/2001) of the subgroup for bovine tuberculosis for monitoring disease eradication in the Member States.

8. That recommendation was made at the start of the Task Force programme, in 2001. Since that time, and in the absence of such action, the number of herds affected by bTB in Great Britain had increased more than threefold, whilst by 2005, almost five times more cattle were slaughtered than in 2001.²⁸ It is, perhaps, little wonder, that CLA is sometimes led to doubt the government's commitment to deal with this disease.

9. The EU's view on the need for action in both cattle and wildlife is supported by evidence elsewhere: in New Zealand a programme to eradicate bTB by 2013 includes culling of wildlife species, including, notably, possums; in the USA, control of bTB includes measures for culling of the much loved white tailed deer; in Australia, action to eradicate bTB required the culling of buffalo; in Ireland, the Four Areas trial showed substantial decreases in incidence of bTB in areas where culling of badgers took place; similar results were obtained in the Randomised Badger Culling Trials where in the "proactive areas" bTB incidence decreased by an average of 22%.

10. The badger is not a rare species: numbers are estimated to have doubled since the late 1980s.²⁹ Yet government policy has been to protect the badger, whilst permitting the potential culling of breeds of cattle which are rarer than the Giant Panda.³⁰ For Britain to have any hope of eradicating bTB, culling of wildlife vectors is, regrettably, essential.

Method of Culling

11. The consultation refers to three basic methods of culling: shooting, snaring and gassing. CLA understands that trial work on gassing using carbon monoxide has yet to be completed. It is regrettable that the government placed such great reliance on the RBCT, and in particular, the one method of culling: cage trapping, which has ultimately proved time consuming and costly, and that consequently it failed to investigate any alternatives over the long period of the trials.

12. It is clear from experience elsewhere that for disease to be eradicated, culling must be efficient and sustained. The RBCT operated culls over a matter of a few days, and, whilst cull rates were good in the areas culled, across the total reactive trial areas they accounted for approximately two thirds of the badgers. Despite the shortcomings of this approach, which include a lack of persistency of culling and the consequent ability of remaining badgers to re-colonise and spread infection, the rate of infection fell in the culled areas.³¹ However, there was a corresponding rise in incidence in the areas adjacent.³² This increase has been explained by the ISG as perturbation. It has been suggested³³ that this effect, which has not been recorded in trials or culls elsewhere, could be avoided by: ensuring culling took out whole family groups (such action has been necessary in other wildlife populations, such as elephants, where there are strong familial ties³⁴); by ensuring persistency of culling—throughout the year, and through following years (as was the case in the initial Thornbury trials); or by attempting to identify infected animals and culling only these, the perturbative effect of uninfected animals therefore having little impact.

13. In terms of practical application, although the use of technology has been suggested to enable the identification of infected badgers,³⁵ it seems likely that there would be difficulties linking infection identified to a particular animal, and, whilst the technology offers tempting possibilities, its practical use could only be limited to areas where bTB was not already endemic in the badger population.

14. Culling will therefore have to be undertaken in a way which enables the removal of complete family groups, and/or which enables persistency of control.

15. Given the range of habitats and topography which may be encountered within culling areas, CLA recommends that a full range of culling methods is retained, to include gassing at the earliest possible opportunity. We understand that a report on gassing options is likely later in 2006. However, we believe that the urgent need for action demands that culling should not wait on further reports, but should be implemented with the range of measures already available.

16. Gassing should be introduced as a control option as soon as possible thereafter.

²⁸ DEFRA statistics.

²⁹ The Mammal Society, 2004 Population Estimates.

³⁰ WWF: Population estimate giant Panda, 2004: 1,600 animals; RBST: 2005 population estimates for Chillingham, Northern Dairy Shorthorn, Vaynol, Whitebred Shorthorn, Irish Moiled, Shetland, Gloucester and White Park all have less than 450 breeding females.

³¹ RBCT—ISG—decrease of c 22% within reactive areas.

³² RBCT—ISG—increase of c 25% within 2 km adjoining reactive areas.

³³ Dr John Gallagher, personal communication, 2006.

³⁴ Zoological Society of London, presentation, January 2006.

³⁵ PCR—Polymerase Chain Reaction.

Organisation of Culling

17. Badger culling arouses strong emotions. CLA does not seek, nor envisage, the eradication of the badger from the English countryside. However, we do recognise that culling of the badger within certain areas will be essential if we are to stop the incessant growth of bTB.

18. There are, however, principles which should govern any culling operation:

19. The government cannot hope to wash its hands of culling by divesting responsibility to farmers and land managers. It is clear that to be effective a cull needs co-ordination, information, support and monitoring. Government cannot expect that to happen if culling is being undertaken by disparate groups of farmers or individuals in small areas.

20. The results of the RBCT show clearly the need for a co-ordinated cull over a wide area. Professor Bourne has stated³⁶ that an area of at least 300 square kilometres would be required for any cull in order to mitigate the edge effect identified in the RBCT. However, the results from the Irish trials suggest that strong geographical boundaries may mitigate perturbation on the edge of any culling area. It is suggested that improved cull rates across the area may also reduce that perturbative effect.

21. The proposals in the government's consultation focus almost entirely on individual licensing by farmer groups. This focus is driven by the partial regulatory impact assessment, which uses figures which, it admits, will have to be revised, and which make some fairly substantial assumptions. We would heavily question the relevance and validity of the partial RIA, given these assumptions.

22. From our contact with farmers and land managers it is clear that culling will not take place in the absence of a substantive lead and direction from government. Farmers will not be willing to undertake the type of piecemeal culling anticipated by the RIA, the type of culling which Professor Bourne advises would be most likely to lead to an increase in bTB.

23. If government is to be guided by science, then it needs to grasp the nettle and do that now: culling needs to take place over large areas and in a comprehensive way. Government needs to issue general licences for those areas where culling can take place. Such licences should authorise trained and competent people to cull badgers within that specified area and by authorised methods, subject to subsequent notification to Defra/SVS of the location and number of badgers culled. Disposal of carcasses should be by the simple method of burial on site, given that government has shown itself unwilling to monitor disease incidence in badger carcasses.

24. Effective culling, focused on the hotspot areas (which have suffered a case of bTB within the last three years, not linked to cattle movement), can significantly reduce the incidence of bTB. However, to be effective, once implemented there must be no loss of nerve by government: bTB has been nearly eradicated in Britain in the past, only for government to pull back at the critical final moments. Culling programmes need to continue for several years to ensure that disease cannot return.

25. Culling in this way and over these areas will impact on badgers. But evidence suggests that badger populations recover.³⁷ Government furthermore has to make a decision as to whether it wishes bTB to spread ever further, unchecked, within wildlife populations—deer, foxes, rabbits, mice, stoats as well as badgers—so that it becomes impossible to control and we are faced with endemic bTB; or whether it is prepared to follow the advice of scientists worldwide, and, in conjunction with improved cattle controls, seek to control the disease in the wildlife reservoir.

26. One aspect is clear: culling must be carried out effectively and comprehensively to be effective. CLA has no desire to see inefficient culling which results in no discernible reduction in disease—a situation where neither badgers, nor cattle ultimately benefit.

27. Our aim is the reduction of disease. The outcome of this consultation process will see whether it is also the government's.

February 2006

³⁶ ISG meeting, 25 January 2006, & ISG report.

³⁷ Thornbury trial—badger populations recovered to original levels within 10 years.

Memorandum submitted by Mrs M Miles (BTB 28)

**CONTROLLING THE SPREAD OF BOVINE TUBERCULOSIS IN CATTLE IN HIGH
INCIDENCE AREAS IN ENGLAND: BADGER CULLING**

SUMMARY

Our support for culling in the light of our experiences of our own closed herd breakdown together with our answers to the questions posed in the consultation document.

OUR REPLIES TO CONSULTATION QUESTIONS

1. **The Principle.** We agree in principle to the culling of badgers as part of a concerted approach to eradicate bovine tuberculosis. Our support for culling is based to a large extent on our own experiences in dealing with the disease in our dairy herd as well as consideration of all the information in the consultation document. We have had a closed herd for 40 years but since October 2004 have lost 60% of our herd to bovine TB. We live in an isolated position at the end of a peninsula, with the sea on two sides and no Bovine TB on the immediate neighbouring farms. Prior to our outbreak we observed dead and dying badgers on our farm. We, our vets and the local SVS vets all agree that our cattle are being re-infected from a reservoir of infection in the badger population. We see no future either in our farm business or in the cattle industry generally unless immediate steps are taken to eradicate the disease in the wildlife.

2. **Culling Policy Options.** We do not consider that any definite choice should be made at this stage between the three options listed. All circumstances are different and each case should be considered on its merits. It would be much easier to make a choice if PCR technology, Electronic Nose, etc could be used to identify where TB is present in the badger population by identifying diseased setts. In our view the proposed sacking of DEFRA staff experienced in badger control is a grave mistake. These people should be retained to organise badger culling and liaise with farmers.

3. **General Cull.** This method might be suitable for a specific geographic area with natural boundaries such as the Roseland Peninsula where we farm and which was historically clear of TB until recent years. We are concerned that the details of any application for a culling licence will be in the public domain because of the Freedom of Information Act, and that this may put farmers in danger from interference from animal rights activists.

4. **Participation.** If a geographical area is designated for clearance we do not consider that this will be successful unless all landowners cooperate. If TB in badgers is identified by methods outlined in 2 above then the law should be used to force landowners to allow a cull.

5. **Coverage over large areas.** Farmers should not be expected to shoulder the burden of a cull themselves. DEFRA staff should be retained and cooperate with farmers to achieve the best results. A blanket cull over a large area may not be necessary if more specific testing of badgers is carried out as already described.

6. **Qualifying Disease History.** Licences to cull should be automatically granted to any farm with a confirmed herd breakdown. This should be immediate and not after 24 months under restrictions as suggested in some documents. In our experience after 24 months there may be no cattle business to save. The extent of the cull should again depend on circumstances and may involve neighbouring farms even if apparently disease free. We cannot stress enough the necessity for on farm identification of TB in badgers and their setts, something that has been denied to us so far. The technology exists to carry this out.

7. **Criteria.** Bio-security measures as a condition of a culling licence should be sensible. While it is possible to keep badgers out of cake stores etc it is not possible to exclude them completely from yards, fields etc. If we managed at great expense to do so we could be accused of denying them their normal feeding grounds and thus be accused of starving them in contravention of the Badger Protection Act. Healthy badgers are not normally a problem unless their numbers increase beyond the natural food supply.

8. This will depend again on specific conditions in any given area.

9. Ditto.

10. Methods of Culling.

11. Yes, or as individuals. Carbon monoxide would appear to be the most appropriate and humane method.

12. Training should be available if required. Written guidelines should be given to every licence holder.

13. By liaison with DEFRA staff on farm.

14. Yes, but provision must be made for the use of artificial light, nightscopes, etc. Lamping is the only way to do this as badgers are nocturnal and cannot be shot in day time. At present lamping is against the terms of the Bern Convention and the terms of Cross Compliance which would put farmers in danger of losing their Single Farm Payments. This also applies to gassing and a number of other methods of killing wildlife.

15. We are not happy with snaring as it is indiscriminate and could catch other animals such as farm dogs, cats, etc. Unless it can be demonstrated that this is a method safe for other animals we would not like it used.

16. Ditto.

17. Ditto.

18. See item 13.

19. Ditto.

20. Cage Traps. We think that cage traps can form a useful part of badger culling. Provision would have to be made for farmers to legally use hand guns for shooting the captured animal as use of other guns is too dangerous. The use of cheap electronic signals to alert the farmer that a badger has been trapped could be used. This will minimise stress to the animal captured. If it is confirmed that a sett is infected we see no reason to delay culling because of a "close season". All occupants of diseased setts should be put down whatever their age as they will all be subject to carrying the disease. To delay the cull would seem pointless. We consider that badger carcasses should be collected by DEFRA for post mortem and incineration at a rendering plant.

21. Monitoring. We believe that all setts should be monitored using PCR technology at intervals, possibly yearly together with the yearly cattle test. Setts should be kept unoccupied until the disease has been eradicated

February 2006

Memorandum submitted by The Wildlife Trusts (BTB 29)

INTRODUCTION

1. The Wildlife Trusts welcome the opportunity to submit written evidence to the Environment, Food & Rural Affairs Committee Inquiry into Bovine TB—Badger Culling.

2. The Wildlife Trusts are a unique partnership of 47 local Wildlife Trusts covering the whole of the UK and the Isle of Man and Alderney. We campaign for the protection of wildlife and invest in the future by helping people of all ages to gain a greater appreciation and understanding of nature. Collectively, The Wildlife Trusts have more than 600,000 members including 100,000 junior members. In addition, we manage almost 2,200 nature reserves, covering more than 80,000 hectares of land. These include some of the UK's finest wildlife sites in both inner city locations and rural areas.

3. As conservation land managers, The Wildlife Trusts run more than 30 farms, own livestock (including c500 cattle, c5,000 sheep, pigs, goats and ponies) and use tenant farmers and graziers to manage our sites. We recognise that the livestock sector is essential to maintaining environmentally sensitive management of the countryside through conservation grazing and we support measures to strengthen the industry.

4. In addition, most Wildlife Trusts have farmers represented both within their membership and on their advisory or executive committees. We also have strong links with other countryside bodies including Farming & Wildlife Advisory Group (FWAG) and Country Land & Business Association (CLA).

5. The Wildlife Trusts accept that TB in cattle is a significant problem for farming in the UK and that urgent action is required to combat the disease. We are extremely sympathetic to the plight of farmers affected by the disease and recognise the serious disruption and anxiety caused to farmers experiencing a TB herd breakdown. We are aware of a number of instances of cattle infected with bovine TB (bTB) on our sites, resulting in inconvenience, additional costs and problems with habitat management.

6. We have been involved in the issue of badgers and bovine TB for more than thirty years, having been represented on the TB Forum, submitted both written and oral evidence to the 1999 Agriculture Committee inquiry and contributed to the GB Strategy on Bovine TB.

7. We would be pleased to provide further information to support statements made in this submission.

GENERAL COMMENTS

8. The Wildlife Trusts welcome the Environment, Food and Rural Affairs Committee inquiry into the Government's consultation on badger culling and the continued debate to develop a long term strategy for the control of bovine TB.

9. We are appending a copy of our evidence submitted in 1999 to the Agriculture Committee and in 1994 to the GB Strategy on Bovine TB which demonstrates that our position has remained consistent. We are also appending a copy of the current submission to this inquiry from Wildlife & Countryside Link, which is supported by The Wildlife Trusts.

10. Our submission concentrates on the principle of a badger cull and is primarily focussed on question 1 of the Defra consultation document. Since we do not believe that the available scientific evidence supports a cull, we have not responded to questions 10 to 20 on culling methods.

 SPECIFIC COMMENTS

In the light of the evidence presented as part of this consultation, on balance, do you think a policy to cull badgers should be part of the approach to help control the disease in cattle in high incidence areas?

11. The Wildlife Trusts accept that bTB is in the badger population, and that badgers along with other native mammals may act as a reservoir for the disease and a source of bTB infection in cattle. However, on scientific grounds we oppose culling badgers to help control the disease in cattle.

12. The Wildlife Trusts believe that there is currently no scientific evidence to support the view that badgers are the main source of transmission of bTB to cattle (the main source being cattle to cattle) or that localised culling of badgers is an effective way of preventing the transmission of bTB from a wildlife reservoir to cattle.

13. We support the scientific findings of the Randomised Badger Culling Trials (RBCT) that localised or limited culling of badgers leads to an increase in the incidence of bTB in surrounding areas.

14. We also believe that recent scientific findings suggest that badger culling over large areas is not only impractical but will still result in potential negative edge effects through perturbation, which are likely to cancel out any benefit to the disease³⁸. This will be exacerbated because of the difficulty of removing all badgers from a TB hot spot area as a result of lack of compliance, badgers' ability to avoid traps and snares, and the potential use of a closed season when females are lactating. We believe that there will be significant non-cooperation of landowners to a badger culling policy (non-compliance was at approximately 25% for the RBCT). Because there is no scientific case for badger culling as a control strategy for bTB, The Wildlife Trusts will not support badger culling on our reserves.

15. The Wildlife Trusts believe that culling of badgers over large areas represents localised eradication of the species. We believe that localised eradication of badgers is publicly unacceptable on moral and conservation grounds, and could be in contravention of the Bern Convention.

16. The Wildlife Trusts believe that even if such a culling strategy were practical, sustainable or publicly acceptable, it would not be cost effective³⁹.

17. The Wildlife Trusts believe that because there is currently no clear scientific justification for badger culling, the Government's main control strategy should be focussed on cattle-to-cattle transmission. Given the above evidence, The Wildlife Trusts believe that any strategy to cull badgers would lead to an increase rather than a reduction in the incidence of bTB. We are also particularly concerned that resources focused on badgers will reduce the attention, funds and momentum for more sustainable solutions such as the production of a vaccine, improvements in cattle testing and movement restrictions, and enhanced biosecurity.

18. At the same time as controlling the spread of the disease between cattle, a secondary strategy to reduce potential re-infection from wildlife populations should be progressed. This strategy should focus on strengthening current research into the nature of the disease in badgers in order to achieve a healthy and stable badger population and specifically looking at demographic trends behind the perturbation effect and the development of an effective vaccine for badgers.

Comments are invited on the options considered and the costs and assumptions made in the Partial Regulatory Impact assessment.

19. The Wildlife Trusts agree with option 1 that no badger control should be considered until they are clearly justified by science.

Under what circumstances should the Government grant licences to cull badgers for the purpose of preventing the spread of bovine TB under the Protection of Badgers Act 1992?

20. The Wildlife Trusts believe that licences to cull badgers should not be granted under any circumstances at present, given the current scientific evidence. We believe that licensing farmers and landowners to cull badgers would result in the following:

- An increase in the lack of regulation and scientific rigour associated with this problem.
 - An increase bTB in cattle due to the perturbation effect.
 - An increase in animal welfare concerns from inappropriate training and skill in killing.
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³⁸ www.nature.com/nature/journal/vaop/ncurrent/abs/nature04454.htm

³⁹ DEFRA Science Advisory Committee letter to Chief Scientific Advisor 20 December 2005.

What qualifying geographical criteria would be appropriate, achievable and reasonably likely to be effective disease control measure?

21. The Wildlife Trusts do not believe that sufficient coverage can be achieved by farmers to deliver a sustained cull over a large area, and localised culling will result in an increase in the disease. We therefore do not consider any qualifying geographical criteria to be appropriate, achievable or effective for disease control purposes.

How could farmers ensure sufficient coverage to deliver a sustained cull over a large area?

22. The Wildlife Trusts do not believe that sufficient coverage can be achieved by farmers to deliver a sustained cull over a large area.

What qualifying disease history would be appropriate?

23. The Wildlife Trusts do not believe that sufficient coverage can be achieved by farmers to deliver a sustained cull over a large area, and so do not consider any disease history to be appropriate.

What could be included in the criteria to define those farmers eligible for a licence to cull badgers?

24. The Wildlife Trusts do not believe farmers should be eligible for a licence to cull badgers under any circumstances at present, given the current scientific evidence.

Would it be practical for primary herd owners to recruit neighbours and adjoining landowners to achieve, say, 75% coverage within 1km of the boundaries of their holding? If not, what might be achievable and reasonable?

25. The Wildlife Trusts do not believe that sufficient coverage can be achieved by farmers to deliver a sustained cull over a large area, and localised culling will result in an increase in the disease.

Over what size of area could self co-ordinated groups of farmers and landowners be expected to manage a cull consistently and efficiently for up to five years, with a high degree of coverage?

26. The Wildlife Trusts do not believe that sufficient coverage can be achieved by farmers to deliver a sustained cull over a large area, and localised culling will result in an increase in the disease.

Do the proposals for monitoring the impact on wildlife look at the right issues? If not, what else do you think should be monitored?

27. The Wildlife Trusts are concerned that any culling proposals should include both a means of measuring success or failure and a clear exit strategy. We believe the current Defra proposals do not include measures to assess the effectiveness of badger culling alongside the impact of increased testing of cattle and therefore do not allow for an exit strategy on badger culling.

February 2006

Memorandum submitted by the British Cattle Veterinary Association (BTB 30)

1. The BCVA is a specialist division of the British Veterinary Association comprising 1,500 members of whom over 1,000 are practising veterinary surgeons working with cattle in farm animal veterinary practice. In this respect a large number of our members come into direct contact with TB control policies as they affect their client's farms. BCVA have been represented on the DEFRA TB Forum and are members of various stakeholder groups affecting the industry.

2. BCVA welcomes the opportunity to respond to this very important Inquiry on the potential role for badger culling in the control of bovine TB (bTB) in the UK. The BCVA response to the Defra Consultation entitled "Controlling the Spread of Bovine Tuberculosis in Cattle in High incidence Areas in England: Badger Culling" is currently being constructed and as such is not yet finalised, yet the comments that follow are likely to form the basis of this response. Additionally, as the cattle specialist division of the BVA, BCVA has been closely involved in the development of the BVA response to both the Consultation and the Inquiry and so not surprisingly there are similarities in our responses.

3. In light of the significant increases in bTB incidence year on year in endemic areas this is perhaps one of the most important consultations on bTB control in recent years. The following quote from DEFRA's own Regulatory Impact Assessment sets the scene well in terms of what is needed in these problem areas.

"In the high incidence areas, where the majority of costs of pre-movement testing and compensation will fall, there is a reservoir of infection in the badger population. Without tackling this exogenous infection reservoir, cattle based measures alone may not be sufficient to have a significant impact on the incidence of disease."

Mr Ben Bradshaw has also said:

“Experience from around the world shows that strict cattle controls are essential if TB is to be contained and eradicated. But it also shows that it is unlikely to be successful unless in addition action is taken to deal with the disease in wildlife.”

4. The draft formal responses to the Consultation questions are attached as an Appendix to this submission. BCVA welcome the fact that that need for a regional approach has been recognised and voiced within policy and consultation documents from Defra and we would like to offer some observations which may help enforce the need for a regional approach.

5. The relative importance of the spread of bTB both within and between cattle and badger populations is perhaps key to the regional importance of the various available control options. It would seem logical that the emphasis should be directed towards control measures most likely to result in the reduction of disease disclosure rates in cattle herds (currently rising at 18% year on year).

- (a) Strong evidence for effective and rapid badger to cattle spread of bTB.
- (b) The data presented by the ISG from the Randomised Badger Culling Trials (RBCT) and highlighted at both the meeting at the Zoological Society of London (24 January) and the ISG open meeting (25 January) showed very clearly that ineffectual badger culling would cause disturbance to the normal badger behaviour of those badgers remaining. This disturbance results in increased “ranging” of badgers which, as a consequence, come in to contact with more cattle herds resulting in increased herd breakdowns. These effects were seen (perhaps surprisingly) within the relatively short time span of the RBCT study which very clearly highlights the efficient mode of spread of bTB from badgers to cattle and would indicate that this badger to cattle spread will happen in any situation where infected badgers come in contact with cattle in these situations.
- (c) Strong evidence for movement of bTB to clean areas by movement of infected cattle. (Translocation of infection).
- (d) Practical experience and studies using BCMS data has shown that not surprisingly the movement of cattle with undisclosed bTB infection results in translocation of infection from the herd of origin to the herd of destination. Usually the number of infected cattle being introduced to herds is low and this is backed up by the fact that many of the new herd breakdowns in previously bTB free areas involve either single or small numbers of reactors. More over the application of a test and cull policy (often applying severe interpretation of the SICCT) results in rapid control and a return to bTB free status for those infected herds. This would indicate that the spread of bTB between cattle in this situation is neither rapid enough to compromise disease control or act as a barrier to the herd regaining bTB free status.
- (e) Closed herds succumbing to bTB breakdowns.

Clearly bTB spread occurs within and between badger and cattle populations but the strong message from the RBCT data shows that the badger to cattle route is an efficient one and this would help explain the numerous herds where cattle movements can not explain a herd breakdown.

6. Although the extensive research from around the world has improved our knowledge about this very complex disease there are still significant gaps that exist; a situation not unique to bTB. However despite this, the application of sound veterinary principles can result in significant improvements towards disease control in animals, clearly evident in the control of Bovine Spongiform Encephalopathy (BSE) in the UK where the science was clarified after much of the effective control measures were in place.

7. In light of our current knowledge, the key points in bTB control as BCVA see them are as follows:

- (a) We need to tackle the spread of bTB in the UK—this statement is supported by the majority of the general public (see Defra survey).
- (b) This disease is prevalent in two major animal reservoirs—cattle and badgers.
- (c) We need to control the disease in both of these disease reservoirs by improving controls in cattle, and starting to tackle the disease in badgers.
- (d) BCVA wants to see a government co-ordinated cull of badgers in high bTB incidence areas where badgers are implicated in the disease picture.
- (e) In the current situation, targeted culling over specific areas linked to herd bTB incidence by shooting and snaring of badgers is the most viable short-term option for control. However it is acknowledged that there are significant practical and welfare issues with these methods of control which need to be addressed.
- (f) Culling should only occur in high incidence areas where there is sufficient evidence to show that there is a high level of infection in the badger population. It is in these areas, where cattle controls alone have not and will not work.
- (g) In the longer term, culling badgers by gassing should be further investigated as it could potentially be the most efficient, cost-effective, and possibly most humane method to employ once issues

surrounding its application have been resolved. Targeting of wildlife disease surveillance and recording of culling activity would enable the effectiveness of control methods to be properly evaluated.

- (h) There is a need to continue research into the application of control methods including culling strategies.

8. BCVA are concerned that there is too much emphasis on cost which, whilst undoubtedly important, must not override the effectiveness of any policy undertaken. The goal must be a significant reduction in the number of cattle herd breakdowns (CHB) that currently cost £26,762 each and are increasing at 18% year on year. However apart from method 2a (cage trapping), Table 9 on p 20 of the Partial Regulatory Impact Assessment implies a similar reduction of Confirmed New Incidents (CNI) irrespective of the culling method used. Calculating the breakeven point is a good economic principle, but when the efficacy of each method in terms of reduction of CNI is taken to be broadly similar, the breakeven point will be lower for the cheaper option. The decision should be based on the ability for the culling method to move the Reproductive Index "R" value to < 1 and so bring the disease under control rather than requiring a smaller improvement in CNI to achieve an economic break even.

9. BCVA also have serious concerns that the estimates for reduction of CNI's with an uncoordinated farmer based approach (Option 3) are likely to be an overestimate, not only in terms of efficacy of the methods employed, but also as a result of fear firstly of reprisal from badger groups against those licensed to cull and their families, and secondly in terms of negative attitudes of others within their local community.

10. In light of the obvious lack of successful bTB control in these endemic areas (in part at least from previous ineffectual control policies) there is a need for a fair, clear, transparent and obvious partnership between Defra and farmers to implement the more stringent cattle and badger controls that are needed. Leaving farmers to take on the task of badger culling alone would not be in the spirit of a partnership. Defra clearly has the experience, personnel and ability to coordinate activities on a wide scale and BCVA feels it is only with such a coordinated approach that the efficiency will reach levels that would minimise or avoid the concerns seen in the RCBT cull voiced by the ISG.

11. BCVA hope these comments, along with the draft Consultation answers in the attached Appendix, are of use to the Committee and would like to thank you again for the opportunity to submit them. Representatives from the BCVA would be only too pleased to attend formal evidence giving sessions regarding this Inquiry should the Committee wish to explore our position still further or, should this not be required, we would be glad to answer any specific issues you may wish to ask us directly by correspondence at the addresses above.

February 2006

Memorandum submitted by British Veterinary Association (BVA) (BTB 31)

INTRODUCTION

1. The British Veterinary Association (BVA) is the national representative body for the veterinary profession in the United Kingdom and represents over 10,000 members. Our chief interest is to protect and promote the interests of the veterinary profession in this country and we therefore take a keen interest in all issues affecting the veterinary profession, be they animal health, animal welfare, public health or employment concerns.

2. The BVA welcomes the opportunity to submit evidence to the EFRACom inquiry into *bovine* TB: badger culling, and to examine the Government's proposals for introducing badger culling as a control measure for *bovine tuberculosis*, as set out in the consultation paper issued on 15 December 2005. BVA has tried to focus on the key questions that Ministers must address in reaching conclusions on the issues set out in the consultation paper, and would be willing to provide further information if requested to do so. However we would like to stress that the consultation period is still open and therefore the contents of this submission should be considered as preliminary, and additional comments may follow.

3. Although much has been learnt about this complex disease in the last decade a great deal remains to be discovered. Even known facts are often fiercely disputed by special interest groups. The need for continuing research, however, is no excuse for doing nothing to bring a worsening disease situation under control. We should therefore devise the most effective control strategy possible using the information currently available. Scientific research has established that cattle and badgers can be affected with *tuberculosis* and that both are reservoirs of infection, excreting and transmitting the bacteria to susceptible animals.

4. The high incidence areas of *bTB* in the UK are well known and many badgers in these areas are infected. It is scientifically implausible to argue that epidemics of *bovine* TB in cattle and badgers in the same area exist independently and are unconnected, or that either can be effectively controlled without addressing both. It is now agreed amongst the scientific community that badgers do play a role in the spread of *bTB* in cattle, which is supported by the initial results of the Randomised Badger Culling Trial (RBCT). The next step is to decide how to deal with this disease reservoir in the most humane and effective manner.

5. BVA has objectively assessed the current control options outlined in the Defra consultation paper from a veterinary perspective, and our recommendations for action are outlined below. The response below has been structured in the same manner as the Defra consultation for ease of reference. A full submission to Defra will be made before 10 March 2006.

EXECUTIVE SUMMARY

We need to tackle the increasing incidence of *bTB* in the UK with the herd incidence of *bTB* increasing by 18% a year. The general public supports the need to control this infectious disease in cattle (92% agreed in a recent survey¹). This disease is prevalent in the UK in two major animal reservoirs—cattle and badgers. BVA strongly believes that in order to control this disease, control measures in cattle and badgers are necessary. We need to improve the current controls in cattle by tightening controls on cattle movements (which are known to be a significant factor in the spread of disease from farm to farm), and by introducing more biosecurity measures on farm with incentives for farmers to reduce contacts between badgers and cattle. (Please visit the BVA website for the Association's full policy on *bTB* control, which includes detailed recommendations to improve cattle controls and biosecurity measures, as well as badger controls). We need to start tackling this disease in badgers now using the scientific information we have available, and sound veterinary epidemiological principles where the science is lacking. We need to be realistic about the options open to us for controlling this disease in badgers:

- (a) Vaccination is not currently an option and won't be in the near future (the next 10 years). However it is the preferred option should it become available.
- (b) Biosecurity is important but will not work in the absence of any other control.
- (c) Culling: scientific evidence has shown that culling can have a positive effect on reducing the number of herd breakdowns within a control area, but can have a negative effect outside of the control area. This suggests that large area culls would be necessary in order for the positive effects to outweigh the negative.

In high incidence areas, the BVA believes that, from a disease control perspective, a large-scale Government co-ordinated cull of badgers where there is evidence of infection in the species may well now be necessary to help control this disease. This will only work if there is significant buy-in from the landowners involved. Landowners must be provided with adequate scientific data to allow them to make an informed decision in relation to the culling of badgers. In the current situation, culling in specific areas linked to herd incidence using snares and shooting appears to be Government's most viable short-term option for control in terms of welfare, cost, and feasibility (with the use of geographical boundaries where possible). This should be considered for areas where cattle controls alone are not working. This should be carried out, or co-ordinated by suitably trained personnel. However it is acknowledged that this method still has significant practical and welfare issues which need to be addressed. Gassing using CO has the potential to be the most efficient, cost-effective, and humane method of badger control. We recognise that issues surrounding diffusion into blind tunnels within a sett need to be resolved, but the technique should be considered as a matter of urgency. The most important point to remember when assessing the options available is that we still don't have all the answers. We need, in parallel with a new policy, to carry out the research, surveillance, and recording of any culling activity—to enable an assessment of the effectiveness of the methods to be evaluated properly. Although recent scientific evidence has brought many issues to light, there are still many issues that remain unresolved.

RESPONSE TO THE SPECIFIC CONSULTATION QUESTIONS

Question 1. *In light of the evidence presented as part of this consultation, on balance, do you think a policy to cull badgers should be part of the approach to help control the disease in cattle in high incidence areas?*

6. Yes. Control measures in cattle must be accompanied by simultaneous and appropriate measures in wildlife. BVA supports a targeted humane culling policy aimed at eradicating *bTB* where sufficient evidence exists to classify a badger population as infected. Although significant new scientific results and postulates have come to light from the initial results of the RBCT, which makes a policy decision on whether to cull more difficult to make, it does not change the fact that we still need to tackle this disease in the UK. It is in the interests of public and animal health that the spread of *bTB* from infected badgers be contained. The current controls which attempt to control the disease in cattle only, are not working and are not sufficient.

7. It is recommended that a long-term strategy for control should include both culling and vaccination, when the latter becomes available, which is expected to take about 10 years. It is conceivable that vaccination of badgers may eventually supersede the need for badger culling, but that remains no more than a possibility at present. In a situation where the control of an animal-based disease is critical, yet absolute science is absent, the application of first principles of disease control by the veterinary profession is essential wherever the disease is identified it should be removed to reduce the possibility of further infection. The eradication of Rinderpest at the turn of the 1900s and of rabies in 1903, and the identification and

implementation of control measures for BSE in the 1990s were both undertaken with success by the application of such principles without a pre-emptive diagnostic test and without a clear understanding of the pathogenesis and epidemiology of the disease.

8. There is sufficient scientific evidence to conclude that the presence of *M. bovis* in the badger population is presenting a wildlife reservoir of infection that inevitably increases the risk of cross infection to other susceptible species, particularly cattle^{2,3,4,5}, which is supported by the initial results of the RBCT⁶. Results from the RBCT showed badger infection levels to be as high as 40%. In order to reduce the incidence of *bTB* in cattle we need to increase cattle controls, particularly to reduce the risk of transmission posed by cattle movements from one herd to another, which are known to be a significant factor in the spread of disease⁷. But we also need to decrease the number of infected badgers in areas where cattle are kept, or decrease the time that infected badgers are infectious, or find ways to separate cattle from badgers and their excretions—in order to deal with both reservoirs of infection. The Wilmore review commissioned to inform Defra on the evidence relating to culling badger, concluded that international evidence clearly shows that *bovine tuberculosis* in cattle cannot be eradicated by cattle controls alone when there is a secondary reservoir of infection from wildlife⁸.

9. There has been a number of trials undertaken that suggest positive benefits from the removal of badgers in infected areas on the incidence of *bTB* in cattle including the Thornbury Trial, the Steeple Leeze Trial, the Hartland Trial, the Offaly Trial and the Irish Four Areas Trial^{4,5,9,10}. Critics damn much of this work as being scientifically unsound by virtue of deviations from standard scientific protocol. The reality is that scientific study inevitably leads to the generation of further questions and further scientific study rather than the provision of absolute answers. The RBCT⁶, although conducted in a scientifically correct manner, was set up to answer specific policy questions and therefore also contained a number of variables within the data which make interpretation of the results more difficult.

RESULTS FOR THE RBCT

10. Initial data from the RBCT shows that badgerculling can reduce the incidence of *bTB* in cattle⁶. It also shows that it can increase the incidence of *bTB* in cattle in neighbouring control areas. The latter effect has been attributed to social perturbation, where culling disrupts the social patterns of the badgers in the area, leading to an increase in movement and therefore transmission of the disease. Although it is scientifically accepted that social perturbation can occur as a result of badger culling, the studies were unable to confirm that the increased incidence at the “edges” were a direct result of the increased badger perturbation. We must guard against a “postulate” becoming accepted as a scientific fact. It is felt that there is tendency to over-conclude the results of the RBCT and it is important to remember that they only apply to the conditions set within the trial. The RBCT was a trial of two potential policy options—and it was clearly demonstrated that they didn’t work under the conditions set in the trial.

11. The results of the RBCT could have been due to a number of factors, including variations in compliance, coverage and culling success within the trial areas. Although the overall average culling rate was estimated to be between 60–80%, in some areas within the trial areas it was as low as 20%, therefore social perturbation would have been occurring throughout the culled areas, as well as in neighbouring areas. The initial results of the trial also don’t tell us what level of clearance would be necessary to result in the disappearance of infection, or what level of population decrease would result in a sustainable level of *bTB* infection within the badger population that would result in a minimal impact on the level of *bTB* in cattle.

12. We can conclude that culling will not be successful or justified, if compliance and coverage is patchy as the edge effect will be increased throughout the culled area and will outweigh any positive effect on the rate of *bTB* in cattle from culling. However it is important to note that even with social perturbation occurring throughout the proactive areas, a 19% decrease of *bTB* incidences in cattle was still achieved. The overall impact on the total area influenced by the culling is close to zero when roughly 100 km² is culled (according to John Bourne in a letter sent to Ben Bradshaw on 7 October 2005). In order for a culling policy to be successful the area would have to be sufficiently large to outweigh edge effects. It is estimated that an area of 300 km² would have to be covered to achieve a 25% reduction in the incidence of *bTB* among cattle. It would also be necessary to ensure that edge effects did not occur within the culling areas.

13. The cause of the increase in herd breakdowns on farms close to culled areas is not certain, but the evidence to support social perturbation is compelling^{2,11}. *bTB* in badgers is a complex disease and TB incidence has not been found to correlate directly to the density of the population. The level of disease in cattle does not correlate with the size of the badger population, or the incidence of *bTB* in badgers (which also do not correlate with the size of the population¹²). These findings support the social perturbation theory, and suggest that culling disrupts the social patterns of the badgers in the area, leading to an increase in movement and therefore transmission of the disease, regardless of the number of badgers in a population. This figure is however dependent on the number of infected badgers within a population, and the chances of them interacting with cattle. A culling policy should therefore aim to reduce the level of infection in a population, and should take into account wherever possible, ecological knowledge of the badger population in an area.

14. The results from the proactive areas do support the perturbation effect but they do not inform the policy maker about what would happen if one increased the efficiency of culling. Would this decrease the perturbation effect seen? From the initial results of the RBCT it would suggest that each time the population is reduced further the positive effects of culling increase, and the negative effects (social perturbation) decrease. In a letter to the Minister Ben Bradshaw, dated 29 November John Bourne noted that analysis of the initial results of the RBCT did suggest that the effect of culling in reducing breakdowns within trial areas increased, amounting to an estimated 5.2% greater reduction in TB incidence for each year since the initial cull, (95% CI: 16.1% greater to 7% less, $p=0.39$ for confirmed TB breakdowns in whole trial areas based on VETNET location data). By contrast, the analysis also suggested that the effect of culling in increasing breakdowns in the neighbouring areas declined by an estimated 3.7% for each year since the initial cull, (95% CI: 17.3% smaller to 12.1% greater, $p=0.63$ for confirmed TB breakdowns in whole trial areas based on VETNET location data). Therefore it could be suggested that if repeated culling continued the negative effect would decrease and the positive effect would increase significantly.

IMPORTANT FINDINGS FROM OTHER TRIALS

15. The “Four Areas” Badger Culling Trial (FABCT) is considered to provide the strongest evidence that badgers play some role in *bTB* in cattle⁵ and supports the need for a large-area consistent cull. Although many have reservations about the statistical design and analysis of the FABCT, in the opinion of the CSA the trial shows strong evidence of lower incidence of *bTB* in removal compared to reference areas (the trial areas in the FABCT were also larger than in the RBCT). In removal sites badgers were intensively culled, in the reference sites, low level “reactive” culling occurred. The difference between the two sites is not thought to be due to social perturbation, as the incidence of *bTB* did not increase in the reference areas over the study period. However, the incidence of *bTB* in the removal areas decreased significantly. The trial areas were also well isolated from surrounding cattle and badger populations by geographical features, which may reduce the edge effects.

16. The level of landowner co-operation was also extremely high. Although there are significant differences between the UK and Ireland in terms of badger densities, *bTB* prevalence, stocking density, herd testing regimes and cattle movements for example, there are also significant correlations which need to be looked into in more detail. It has been noted that edge effects were also not seen in the Thornbury or East Offaly trials¹⁰ which is thought to be due to the fact that they were geographically isolated with boundaries relatively impermeable to badgers. This demonstrates that badger impermeable boundaries are effective in preventing the edge effect and should be used whenever possible.

THE BADGER POPULATION IN THE UK

17. Badgers are a protected species and the BVA supports the continued protection of the badger from those elements of society that might wish harm on the species in the name of sport or recreation. However, badgers are not an endangered species and in the right conditions will breed prolifically. The current population is estimated to be around 300,000 and there is no immediate risk to the overall numbers of badgers should culling in particular areas of high *bTB* incidence be an integral part of any control policy. There is still a shortage of truly accurate information as to the level of infection in the badger population with *bTB* both in the risk areas and outside and further research in this area should be encouraged. The BVA would urge Government to consider a census of badger numbers as a matter of urgency.

February 2006

Memorandum submitted by F Fraser (BTB 32)

1. Bovine TB is exactly that—a problem of TB in cattle and needs to be solved in cattle.

The TB test is notoriously inaccurate; there have been many incidents of cattle testing positive and have proved to be free of TB after slaughter and also some cattle proving to have TB when slaughtered having passed the test as clear. Apart from the unnecessary waste and expense, the numbers of cattle actually having “TB” are therefore not the same as those culled as a result of positive test results. There needs to be a new accurate test developed for detection of TB in cattle.

2. During the last 30 years the continued denigration and associated “legal” and illegal killing of badgers with considerable cruelty involved . . . (badgers a protected species!), has made no impact on the TB in the South West. The badger population is dispersed when interfered with. Badgers have been made a scapegoat with an enormous amount of resources wasted which would have been better used to develop a vaccine for eradicating TB in cattle.

3. Recent suggestions to use snares and possibly encourage farmers to gas badgers themselves are unacceptable. There is no universally recognised method of humanely killing badgers in large numbers—even if the idea were acceptable; which to my mind, and to that of many others, it is not. The manifold dangers of snareing, to all wild life and domestic animals are intolerable, as history has taught us.

4. Other species, eg deer and cats carry bovine TB . . . will the next step be to eradicate these in specific areas? It would be logical but unacceptable.

5. The answer to Bovine TB must be found in cattle; had the funds wasted on the pursuit of badgers been spent on a vaccine for cattle, its development would have been at least 20 years further on. It must be developed now and wildlife left alone. There is no evidence of a badger population rife with bovine TB.

6. It is accepted that TB thrives where there are increased stress levels—intensive farming methods have placed cattle in situations of increased stress which has contributed to the problem.

SUMMARY

1. The present test for TB is inaccurate. New test should be developed for TB in cattle.
2. Badger denigration through the last 30 years has increased the problem without solution.
3. Suggestions to cull badgers on a large scale are totally unacceptable and useless, and causes migration in badger community.
4. Other species carry Bovine TB.
5. Solution should be looked for and found in cattle: vaccine must be developed—in cattle.
6. Other causes for increase incidence of TB in cattle.

February 2006

Memorandum submitted by P Caruana (BTB 33)

My name is Paul Caruana and I work for the Defra Wildlife Unit (Polwhele) that is currently wrapping up the Krebs Trial. I have worked in the Unit for 12 years—five as a fields person, four as a Field Supervisor and the last three as a Field Manager (Higher Scientific Officer). I have been involved in the live testing regime of the early 1990s, the Badger Removal Operations of the mid 1990s and the current Krebs Trial since its inception. I feel that my experience as an ex-RAF Logistics Officer and as an individual that has had lots of “hands on” experience could be valuable to any balanced and rational debate affecting the future policy in handling the current TB epidemic.

To start with, I feel that I have enough anecdotal evidence, gathered over my 12 years, to have a good feel for what should have happened in the war against TB. Unfortunately, and as I know only too well, this type of evidence isn't usually acceptable, but here it comes anyway:

1. Badger removal operations worked well when the land being culled was made fully available, not just the area dictated to us by vets.
2. Where badgers were totally removed from a farm, that farm, after it had its infected cattle culled, often stayed clear of TB for up to 10 years.
3. We stayed on farms for up to three months to ensure that ALL badgers were caught—unlike the Krebs eight days per year trapping regime.
4. You do not need large scale culling for it to be effective if the culling effort is robust from the start.
5. Krebs had too many anomalies and weaknesses in the strategy for it to be successful. It took us four years to steer away from trapping setts that had been interfered with by Animal Rights Activist, to being able to trap badgers anywhere in order to eliminate them. That is only one of a raft of operational problems we faced and had to endure.
6. Limited trapping—eight days per year with Krebs—has little effect if carried out late in the year—the effect being that areas went almost two years without an effective cull.
7. The costs for a future culling policy must NOT be based on Krebs costings. The Wildlife Unit have many great ideas on how to reduce costs vastly should the State remain involved in it. Give the Unit the chance to see how innovative it can be when it comes to reducing operating costs. Krebs was ridiculously expensive for what it delivered.
8. The Public and the NFU are demanding that “professionals” remain involved to ensure adequate training is given to those with the task to do, and to ensure that animal welfare and humaneness remains a number one priority. Overseeing the task will give some comfort to those who fear that this might not be the way.
9. Compulsory entry onto farms is a must when considering what Policy to adopt. Making farms who receive Government subsidies participate in one of its schemes must be made compulsory. Krebs has proven that wide scale non-cooperation does make it nigh on impossible to operate effectively.
10. The Krebs Reactive strategy was prematurely ended in my opinion. The results used also showed us that, in areas we had never operated in (areas J2 and H1 which had a very limited cull) also displayed the same increase in TB outside of the areas. That has to have another logical reason for the increase, as it clearly was not badger culling related. This point has yet to be satisfactorily answered.

11. The combined knowledge of the staff involved in all of the previous culling strategies has never been utilised or sought when putting together a Policy. Why can't the common sense approach ever be used when facing problems such as TB. We feel that we have the answers, if only somebody would listen to us. Details of the possible ways of operating are being submitted to the TB Consultation committee.
12. Be prepared to change a policy, to let it evolve, is a must. All strategies have seen staff restrained in what they would like to do, often flying in the face of common sense. Taking the risk—isn't that what it often needs to make things work properly? We have been shackled for too many years by rules and red tape—now is the time to be radical and make things change for the better.

I have probably said enough about the strategies I have participated/operated under. I know that my staff feel exactly the same way as I do on these matters. Scientists do not have all of the answers, and most certainly, Krebs doesn't. The Trial has far too many flaws in it to be trusted to produce meaningful evidence. I know what happened on the ground—the scientists only have the results we provided them with to work with. I know that those results could and should have been much better and useful than they currently are.

Nobody, and I mean nobody, working on the trial at the grass root level has ever believed that operating under the too strict and inflexible regime that Krebs put in place could work successfully. All the common sense answers to everyday problems were too often ignored because “things had to be carried out scientifically” to mean anything. The whole basis of Krebs was to remove badgers off of the ground. For the first four years, that effort was farcical due to the restrictions placed upon us. Repeated requests to change operating methods were ignored. With that in mind, how much weight do we give to the latest ISG report, detailing their “robust” findings to the Minister? If it were down to me and my staff, very little.

Memorandum submitted by C Thomas-Everard (BTB 34)

COMMENT ON BOVINE TB CONTROL TO EFRA SELECT COMMITTEE

1. I write having heard, at 5.45 am yesterday, a report of some of the statements made to the Select Committee by members of the ISG—as I feel our experience and conclusions may assist the Committee. I hope very much that this comment is not yet too late for you to pass to members of the Select Committee.

2. We farm on Exmoor and have much experience of bovine TB. It is also apposite that I write when the results of TB incidences for the whole of 2005 have just been released showing that bovine TB has worsened in this one year—27% more cows have been compulsorily slaughtered as reactors (25,373) and that 27% of all herds in Gloucestershire, 21% of all herds in Devon and 20% of all herds in Hereford & Worcestershire have been under movement restrictions during the year (3,667 herds in the SW (and 5,242 herds nationally).

3. Several vets tell me that the rate of spread within the badger population, and from them to cattle, may increase much more in the coming years than the average of 18% in past years. Therefore, the quoted cost of £2 billion for the next ten years to continue dealing with, but not controlling bovine TB, may be an under-estimate.

4. I also believe that politicians and the public should treat the controlling of the spread of TB from infected social groups of badgers to the rest of the badger population as a matter of controlling a wildlife disease, as important as stopping the spread further into the cattle population. The photograph below shows the reason.



A badger badly affected by TB, after a bite from an infected badger.
The huge neck abscesses have turned to puss.
This badger would have suffered for a long time before dying.

EXECUTIVE SUMMARY

My family are engaged in hill-farming and beef production on Exmoor.

A. We have been affected by bovine TB in our herd of over 800 cattle on seven occasions since 1993 each time coming clear after repeated testing and removal of infected cattle.

B. There is strong evidence that our problems have been derived from an outside wildlife source—which I believe to be TB-infected badgers.

C. I consider that it is possible to differentiate between infected setts, less infected setts and uninfected setts using the PCR Enigma Field Lab within 20 minutes of taking samples.

D. I am sure that using only snaring and shooting as the only means of killing badgers will be infective and will spread bovine TB to more herds.

E. I believe that treating TB-infected setts with petrol exhaust gas (properly adjusted for maximum CO emission) is easy to administer and humane. Such treatment causes minimal amount of stress and can be carried out in the daytime at a cost lower than any of the alternatives while all the members of an infected social group of badgers are asleep underground.

F. I believe that wherever there is a widespread area of TB-infection in sentinel cattle most setts in such areas should be dealt with by engine exhaust gas, with coordination being administered by DEFRA and the work carried out by farmers, gamekeepers and DEFRA's wildlife team. Some healthy setts, identified by PCR analysis as being un-infected could be left if the PCR machine, referred to above, is as effective as the MOD developers at Porton Down state.

G. If this work (F above) is done thoroughly, I believe the immediate results of having far fewer herds with TB breakdowns will mean that the cost to DEFRA of administering a cull of infected badger social groups will be less than the cost of dealing with more and more herd breakdowns, even in the first year.

H. I believe that if such exhaust gas treatment of infected setts is carried out effectively, bovine TB could be eradicated within 4 years to the same low level of only 0.1% of herds being under TB restriction that existed in 1980.

I. In order to achieve that speedy improvement, and a rapid reduction in the cost to DEFRA of over £100 million in 2006 of dealing with bovine TB, it is essential to retain the skills and knowledge of the 2 DEFRA wild life teams; 52 at Polwhele, Truro and 48 trappers at Aston Down near Stroud.

A. *Background to our knowledge*

1. A few of our herd of 350 suckler cows and their calves were first infected by bovine TB in 1993, after being clear of TB for 34 years. At first 3 out of 657 were found and slaughtered as TB reactors. At the two next tests in June and August a further 6 cattle had picked up infection.

2. I believe that this infection originated from TB-infected badgers introduced into the Exe Valley after being "rescued" from MAFF traps at Chagford on the edge of Dartmoor. I understand that the spoligotype of the TB in our cattle and the infected badgers in this valley was the same as that found at Chagford.

3. Shortly after that first outbreak in 1993, MAFF trapped and removed all badgers here and up the valley towards Mr Rawle's farm which first had a TB breakdown (a closed pedigree Devon herd). Of the first 47 badgers, 40 were found to be infected with TB (85%), 7 with open infectious lesions. When a further 100 badgers in setts on the edge of our property where trapped, killed, examined and samples cultured, all 100 were found to be free of TB. Unfortunately the data was then generalised so that it appeared that the 40 were infected out of 147, indicating that only 27% were infected. I suspect some of the Krebs trial results may be similarly over-generalised.

4. After that initial outbreak, we were clear of TB infection for over 3 years and I believe this to be because those infected badgers had been removed.

5. Only in 1997 did we have further TB infection in the herd. 10 invasive badgers were then trapped of which 4 were found to be suffering from TB. Each year since then we have found TB in the herd when tested in the early winter, a month or more after housing.

6. Although we are not totally self-contained, the only cattle brought onto the farm are about 30 bulling heifers a year and the occasional bull. We have never had a TB reaction in a bought-in animal within the first two years of arrival—which would happen if the infection came from bought-in animals.

7. With the exception of two years we have gone clear at repeated TB testing during each on the 9 winters since 1997. In all cases the incidence of infection has reduced during winter testing. If there had been any cow-to-cow transmission of infection the TB problem would have got worse instead of improving during the winter. I am advised that cow-to-cow transmission is potentially possible during winter housing but is very unlikely during extensive summer grazing.

8. We know from discussion with neighbours and others that this sequence of going clear during the winter and finding infection after summer and autumn grazing is a common situation.

9. Because we record where each animal has grazed each month and in which group, we can identify which part of the farm gives rise to TB infection during the summer. Often the infection is picked up by and identified in young stock which tend to be more curious graziers, reaching under gates and into hedges where badgers patrol and mark their territory by urination.

10. Last week our herd of 808 cattle tested clear of TB. Even on severe interpretation (a 3 mm lump in the skin instead 5 mm) there were no reactors and one animal only showed as an IR (inconclusive). Last week's result was the best (fewest IRs) we have ever had. We believe this to be because we are in the Krebs proactive area in which the DEFRA wildlife team have removed most badgers. If at the next test in 60 days time we remain clear we will again be allowed to sell live cattle.

11. To ensure we are protected from infection from bought-in replacement breeding heifers and the occasional bull, we always put such bought-in animals on another farm, farmed by this family, which has consistently remained clear of TB. Only after a post-movement test do we transfer such heifers onto Broford Farm where the main herd reside.

12. For all of the above reasons we conclude that we have not had any infection from bought-in cattle and that the source of our infection has been from the TB-infected badgers found on the farm or travelling up the heavily wooded Exe Valley.

B. *Other Outside Information*

1. The current standard, EU enforced, intradermal herd test for TB is very reliable, particularly when two tests are carried out 60 days apart. Infection picked up within 8 weeks before a test is less likely to be identified, because the bovine animal has to have time to develop hypersensitivity to any TB bacteria encountered. (For this reason the proposed pre-movement test may give a dangerous false sense of security). It seems very strange that so little notice is taken of the remarkably low annual record of TB found in slaughterhouses where every bovine animal is purposely inspected for TB. This for 2005 was only 288

animals with TB lesions found in over 3.23 million adult cattle slaughtered at the 33 UK abattoirs (with another 1/2 million slaughtered as calves). The figures for 2004 was 201, for 2003: 161, and for 2002: 163. For 2005 the figure was equivalent to 1 in every 11,215 cattle (0.009%). This figure of only 288 cattle included animals from areas on a 2, 3 or 4 yearly TB-testing regime, and therefore many such cattle would never have been TB-tested in their lives. What this minimal number of TB cases found at slaughter also surely demonstrates is that there can be very little cow-to-cow transmission.

2. In addition to seeing that the standard skin herd test is very effective at not missing TB infection (as shown above), if anything it is hyper-sensitive. It should be noted that for 2004 (the latest results published) only 6,413 cattle were confirmed to have TB out of the 19,972 compulsorily slaughtered in the UK as TB reactors to the skin test, i.e. 68% of the 19,972 reactors did not appear to have TB and may have been "false positives". This bears out our own results when, in the one year we tested right through the summer, we had 25 reactors over 4 tests, none of which on post-mortem were found to have TB, either by visible lesions or by culture testing. We (and the SVS vets) suspect that there was a small amount of badger-originated TB infection at pasture which sensitised the 25 cattle to TB without incurring the disease.

C. Potential huge advantage of using the MOD's Enigma Field Lab PCR machine

1. This Field Lab will give a reliable result as to whether a particular social group of badgers have TB within 20 minutes of samples of badger faeces (or urine or saliva) being put in it by any un-skilled person by matching the DNA of bovine TB. Thus the Field Lab can be used to identify where the edge of any proposed badger culling area should be to avoid the culling causing dispersal of infected badgers. Thus the 29% increase in herd TB breakdowns, identified as a problem during the Krebs trial, can be avoided or mitigated.

2. There may be also a role in identifying some social groups within a cull area which are not infected with TB so that these can be left to repopulate culled areas. This is a hypothesis which as yet is unproven, but work on using PCR machines to identify healthy social groups of badgers on the edge of culling areas will quickly indicate the approximate proportion of healthy setts to infected ones within a cull area. Thus if a number of healthy setts can be left alive, farmers and politicians can live with an easier conscience that they are not causing local disappearance of all badgers; there will be less chance of a ruling by the EU that Articles 7 and 8 of the Bern Convention have been breached and the culling is "not detrimental to the survival of the populations concerned" in such areas; and lastly the political task of reassuring the public that the culling of infected setts is necessary to save the health of the badger population will be more easily achievable.

3. I attach with this comment details of this Enigma Diagnostics machine.

4. This device requires no laboratory skill in preparing samples, all the preparation to draw out the DNA of the sample is automated in a series of treatments in the top half of the machine (the field lab), and gives a clear positive or negative answer within 20 minutes as to whether the DNA in the sample matches the bacteria being sought.

5. This Enigma Field Lab has been designed at Porton Down by the MOD to give a certain and definite answer to soldiers suffering a biological agent attack as to whether anthrax or other live organism is present, and what protection to don or utilise. It is therefore designed to be soldier-proof and to be sufficiently reliable because lives depend on its accuracy.⁴⁰

6. I am assured by the Porton Down personnel who designed the Field Lab that there will be a reasonable degree of accuracy if a number of samples from a badger latrine are mixed and analysed as to whether the setts adjoining the latrine are infected by TB. If a more accurate result is required then samples of badger urine or saliva will give better results also with 20 minutes. Other live tests on badgers have been very unreliable and take about a minimum of three days for an answer. If mixed samples from badger latrines proves to be effective at identifying clean setts, then farmers could send such samples to a central point by post for immediate confirmation that their sett is healthy or infected.

7. Enigma Diagnostics is owned by the MOD and the Treasury so any payment by DEFRA to the MOD will make no difference to the tax payer, merely causing interdepartmental accounting. Enigma Diagnostics are willing to enter into a financing arrangement once DEFRA are satisfied as to the effectiveness of this machine.

8. Enigma Diagnostics have already drawn down an assay of BVD (Bovine Viral Diarrhoea) from University work being carried out for DEFRA and used this in the Field Lab. In the same way much time can be saved by DEFRA asking Dr Mike Taylor of the Department Of Infectious Diseases and Micro-Biology, Imperial College, London, to make his bovine TB assay available to the Enigma team. Dr Taylor has been carrying out bovine TB work for DEFRA—principally on testing cows.

⁴⁰ You can also go to the Porton Capital website at the web address <http://www.portoncapital.com/web/index.php>. To enter the demonstration part of website, type in the username as porton and the password as down. There is a video entitled "Out of the lab" which you can view. For further information contact Dr Ian George, Business Development Director, Enigma Diagnostics Ltd, Building 224, Tetricus Science Park, DSTL, Porton Down, Salisbury, Wiltshire SP4 0JQ.

D. *Reasons why snaring and shooting alone should not be adopted*

1. I personally have a horror of snares having had a favourite terrier killed in someone else's snare. Whatever the intention, one size of "stop snare" cannot fit all size of badgers or dogs without causing very serious injury or death to larger animals.

2. I understand the law on snaring is that snares have to be inspected every 3 hours. In the case of badgers, which as a specie, are very wary, this requirement, although necessary for welfare reasons, is likely to reduce the number of badgers snared and will have a very high man-hour requirement. Once the method of culling badgers in the 1980's was changed DEFRA found that there was a fivefold increase in the number of personnel required to trap badgers compared to the previous regime. The earlier method of culling, when eradicating TB from the whole Thornbury area near Bristol and the Isle of Purbeck in Dorset, was by gassing with Cymag (made illegal under EU law from January 2005).

3. In reality if farmers have to do the snaring themselves, the pressure of other farming tasks is likely to mean that many snares will be set in the evening and only inspected in the morning. There is therefore a likelihood that dogs, cats and deer may be caught and die in extreme pain in such snares.

4. Having listened to many farmers about this subject I find that few want to take part in a campaign of snaring alone.

5. I understand that when badgers are caught but not killed in a "stop snare" they will demolish a bank, or undermine a small tree to try to free themselves. They also try every possible way to get free including twisting the wire into a tight spiral or excessively tightly around and around themselves.

6. Setting snares on visible badger runs will merely weaken the social structure of a group of badgers by killing the healthy dominant males, which regularly patrol the boundaries of their territory, leaving sick TB-infected older badgers either in the sett or ejected to travel randomly. Removing the settled dominant male will cause fighting for territory.

7. Bites from infected badgers fighting hither-to uninfected badgers will cause the type of disease symptoms and wounds shown in the photograph at the beginning of this comment.

8. I believe that Appendix IV and Article 8 of the Bern Convention ban the use of indiscriminate means of killing badgers and prohibit the use of snares on badgers (unless exempted under Article 9 if "there is no other satisfactory solution").

9. If badgers are only to be snared or shot, then the current rule that a close season should be observed while badger cubs are reliant of a lactating sow is likely to apply. For the past 8 years of the Krebs trial, the DEFRA wildlife team has observed a close season from February to April in each year. However, it is now realised that, with milder weather, many badgers have far better winter feed and often make intensive use of crops of fodder maize. This has resulted in badger cubs being born outside of the normal late January / February season. If it is proper to avoid killing badgers when lactating sows may still be feeding their young then, by extension if sows are having two litters in a year or in eighteen months, the close season should match the period when neonatal cubs are suckling and there may therefore be almost no season when badgers should be snared or shot.

10. Relying on shooting badgers at night by rifle from a cross country vehicle in motor-able fields within 100 metres will be very piecemeal, and will cause dispersal of TB-infected badgers as the remaining ones fight for territory (so-called "perturbation"). I understand that badgers are much more shy at night than foxes and disappear when they see a light moving in a field.

11. I believe that only a minority of farmers own and have firearm certificates for rifles of sufficient size (.223) to kill badgers properly (ie a .22 rifle is too small). However well practised and competent the rifle user may be, the high rate of wounding in any mass attempt to cull sufficient badgers at night would cause far more suffering than treating badger setts with car engine exhaust in the daytime while the occupants sleep.

12. Snaring and shooting should only be used as a last resort where car exhaust cannot be used, such as dealing with a very sick badger which seeks shelter in farm buildings and has been thrown out of his old sett by his family. The fullest possible toolbox should be available to ensure a really complete cull of infected setts. For this reason cage trapping by the DEFRA Wildlife Teams may also be necessary (see page 10).

13. Very sadly, in the last 18 months, one teenager was accidentally shot by his stepfather while lamping foxes, and another person suffered a punctured lung (and nearly died) from a rifle shot while watching a badger sett at night in similar circumstances. Such accidents may be even more probable if large parts of the SW and West Midlands are peopled at night by farmers desperate to go clear of TB reinfection, or to prevent TB affecting their herd.

E. *Petrol Engine Exhaust Gas*

1. In contrast to snaring and shooting, petrol engine exhaust will kill an entire TB-infected social group at once. These means that any suckling cubs will be culled as they sleep beside their dam, so that there is no need for a close season. This means that setts can be culled concurrently across a whole infected area on the same day, minimising movement or dispersal of lone badgers and avoiding territorial fighting. If a number of the healthy setts are left entire, the social groups in them will not be weakened.

2. The sickest badgers tend to be ejected out of the main sett as soon as overcrowding occurs. These TB sufferers will be ejected by their progeny in the normal way, but because there will then be many empty badger setts to which such sick badgers can retire, they will move to such empty setts and drag out old carcasses.
3. Twigs should be placed across the entrances of previously gassed setts after gassing and inspected regularly. As soon as fresh nomadic badgers are seen to have entered the sett it should be gassed again. This should thereby catch any TB-infected badgers which have been ejected from the healthy setts.
4. The DEFRA desk study records that normal petrol engine exhaust contains about 2% Carbon Monoxide (CO) when idling with adjustment to the carburettor to limit the air. American studies shown on the internet quote CO from an American petrol engine as being 12% and 24% if "detuned".
5. The DEFRA report states that petrol engines produce about 6% carbon Dioxide (CO₂) and that CO₂ increases the breathing rate and speeds absorption of CO. It concludes that 1 % CO in 1 hour is a lethal concentration.
6. Carbon Monoxide is odourless and colourless. If done quietly, a sett-full of badgers, which sleep by day, can be treated while they stay asleep. CO induces a deeper sleep followed by a painless death. I understand the main side effect, if any survive, is normally only a headache and nausea.
7. I understand from reading the DEFRA paper that, by computer modelling only, the authors concluded there would be a slower dispersal of exhaust gas into blind tunnels. In practise however exhaust gas can be seen on a cold day to mix rapidly with air. My very limited understanding of physics is that, by diffusion, gases and vapours mix and reach an equilibrium. Avogadro's law, "that equal volumes of gases, at the same temperature and pressure, contain the same number of molecules" indicates this, unless the gas is particularly heavy, or very light e.g. hydrogen.
8. Because there are plenty of gas concentration measuring devices available commercially as gas alarms for domestic and marine use, the dispersal rate of exhaust gas in blind tunnels can rapidly be determined.
9. Most large badger setts have extensive links to a number of outlets and have, in addition, ventilation holes in the main accommodation. Treating a large and complex sett can therefore be done by watching for the exhaust gas to emerge and after sufficient time blocking each exit and ventilation hole. Any hole where exhaust gas does not emerge can then be treated separately. Adding an odourless colouring agent to the petrol to make it easier to see where exhaust gas emerges would be beneficial. I understand that most recent experience of engine exhaust gassing has been that of dealing with heavy infestations of rats or rabbits in banks.
10. The DEFRA report confirms that diesel exhaust contains at most 0.2% CO and should not be used.

F. Selecting a widespread area of culling infected setts

Where TB infection in the sentinel cattle indicate that TB is in some of the badgers within an area, the setts in that area should be dealt with by the most humane and effective manner. If possible PCR analysis should be used to identify uninfected social groups. It seems essential that coordination of such culling should be administered by DEFRA and the work carried out by farmers, gamekeepers and DEFRA's wildlife team. Such a cull should be carried out within a short time scale preferably, on the first occasion in an area, on the same day.

G. Cost to DEFRA could be less than the cost of continuing to test increasing numbers of cattle and the other component costs in failing to control TB

1. If this work (F above) is done thoroughly, I believe the immediate results of having far fewer herds with TB breakdowns will mean that the cost to DEFRA of administering a cull of infected badger social groups will be less than the cost of dealing with more and more herd breakdowns, even in the first year. Our own experience has usually been that once the source of the TB infection, infected badgers, was removed, the following TB test of the cattle proved them to be free of TB. Where TB-infected badgers (85% with infection) lived, the cattle TB test at the end of the grazing season (when cow to cow transmission is highly unlikely) proved a few cattle in the herd were positive to fresh TB infection (less than half of one percent). However even those very few infected (usually young) cattle caused a period of further testing (testing being the main element, £36 million, in the costs to DEFRA of dealing with TB).

2. Thus the reduction to be brought about in the spread of TB to fresh healthy badgers and from them to healthy herds will give an immediate reduction in the biggest item in DEFRA's TB costs.

H. *Eradication of bovine TB within 4 years*

1. To stop the suffering of badgers, the distress to farmers, the loss of productive animals and the escalating cost of over £100 million a year which has failed to control TB, the target surely must be to use all practical measures possible to eradicate (or at least to reduce bovine TB incidence back down to 0.1%). In only 20 years of procrastination bovine TB has worsened from less than a 100 herds affected to 5,634 herds in 2005 and from 686 cattle killed as reactors to 20,119 cattle. I believe that if all practicable steps are taken bovine TB can be brought down to a minimal level within 4 years.

2. The very removal of infected setts will cause a substantial reduction in the overcrowding and competition for territory that currently causes TB to spread from one badger social group to another and to cattle. Where older badgers are sick with TB they will be ejected by their progeny in the normal way, but, because there will then be many empty badger setts to which such sick badgers can move, they will move to such empty setts and drag out old carcasses. Thus old TB sick badgers are much less likely to go into farm buildings looking for any form of shelter.

I. *Retain the DEFRA wildlife team*

1. In order to achieve a speedy improvement, and a rapid reduction in the cost to DEFRA of £ 90.5 million in 2005 (forecast to rise to over £120 million in 2006) of dealing with bovine TB, it is essential to retain the skills and knowledge of the 2 DEFRA wild life teams; 52 at Polwhele, Truro, and the 48 trappers at Aston Down, near Stroud.

2. This is not as great an immediate cost as may be supposed because only 20 of the skilled wildlife trappers have contracts which terminate shortly. The cost of the retention of these 100 highly skilled people should be borne by DEFRA until TB is brought under control.

3. The fact that bovine TB is out of control is essentially because successive Ministers have abrogated their governmental responsibilities by refusing to make a decision to control the infection in badgers before it got out of hand. Ministers have tolerated TB-infected badgers spreading infection to other healthy badgers, and to cattle, almost wholly for political reasons.

4. Until Ministers confirm their decision to control TB in infected badger setts, the skilled trappers should continue to be employed. They should use the time to identify healthy badger social groups at the edge of infected areas, while the ground is soft enough for tracking, and before the growth of leaves, shrubs and grass in the Spring obscure the badger setts.

5. A great advantage of retaining the 100 trappers is that they can, legally and with their specialist skills, trap badgers where it is desirable to do so. This will include live trapping within infected areas on the boundaries of properties where the owner will not allow anyone access, and in situations where it is helpful to take saliva or blood samples directly from live badgers to confirm that the spoligotype of the TB in the badgers matches that of TB in the adjoining cattle.

J. *Information source*

At present much veterinary advice is that cattle are acting as sentinel animals revealing a wildlife problem. I can only end by saying that coalminers would not have survived long if the mine-owners had merely killed all sentinel canaries and taken no other action to prevent fire-damp explosions.

Much of the knowledge about the behaviour of families and social groups of badgers in this paper comes from Mr Bryan Hill. Mr Hill has made a very through study of the behaviour of many different social groups of badgers. I recommend very strongly that anyone who is in a position of responsibility as to the choice of methods of controlling bovine TB should talk to Mr Hill.

February 2006

Memorandum submitted by the West Wales Badger Group (BTB 35)

1. With reference to the telephone conversation this morning to your office and because we were invited by the Council of Europe Standing Committee to give our expert advice at the Bern Convention in 1998 we consider it necessary for us to write to your committee concerning the plight of the badgers.

SHOULD BADGERS BE KILLED TO STOP BOVINE TB

2. The present ongoing, senseless slaughter of the European Badger by the Department for Environment Food and Rural Affairs in the United Kingdom is already taking a heavy toll on a protected species and causing fragmentation of the species in areas where badgers have already suffered disturbance and illegal killing for many years.

3. The Badgers implication by MAFF in bovine TB was based on the need for a warm-blooded mammal as a suitable political scapegoat. The objective was to distract farmers from the problems and costings resulting from this country's entry in the Common Market, first proposed in 1957 and then finally entered

in 1973 by Britain. Part of the terms of entry into Europe related to a change in the TB testing of British cattle to a more critical test. This would inevitably reveal more reactors during testing of cattle herds. Compensation demanded by farmers and the NFU on their behalf would be substantial. An explanation was required for a situation, which would appear to be a major Bovine TB breakdown.

4. The stated purpose of the official cull of Badgers is the supposed halt of the escalating disease of Bovine TB in the National Herd. When the last badger is killed, the problem of Bovine TB will not be resolved. This is a cattle to cattle disease. Badgers have a high immunity against TB and if they are displaying confrontation with the disease in the environment, they are an indication of the “dirtiness” of that environment. Confrontation with the disease does not necessarily bring about infection or result in the individual confronted having a high immunity, or becoming a reservoir for the disease.

5. The Krebs review presented no new evidence that Badgers were responsible for the transmission of the disease of Bovine TB from Badger to cattle. Professor Sir John Krebs FRS Chairman of the Review Group, was faced with an impossible commission to produce a Scientific Report regarding an investigation, which had never been founded on a sound scientific basis nor conducted scientifically thereafter.

6. Professor John Bourne was also represented with a similar remit, which in fairness to the gentleman; he was attempting to approach along strict scientific lines of investigation. However Professor Bourne was faced with a hopeless situation harassed by illegal activities in the areas selected for Reactive, Proactive and No Culling Experiments. Angry farmers frustrated by government policies and incited by various vociferous individuals to take their own action against Badgers do not appear to realise they are victims caught in the same political net as the Badger.

7. It is ironical that the Badger, our oldest indigenous and most interesting mammal endured centuries of persecution and cruelty due to ignorance and wild theories based on folk law. This shy and secretive species, although now protected is pilloried by ill-informed and plain wicked people who are desperately denigrating the Badger to serve political ends. Fantasies about Badger population explosions display an abysmal lack of knowledge of the fascinating truth of the species reproduction cycle and in-built control of excessive breeding. Comparisons are drawn between Badgers and rats demonstrating a total lack of natural history and behavioral knowledge of both species.

BADGERS ARE NOT A HUMAN HEALTH HAZARD

8. From the time that the Government of the day first implicated the Badger in Bovine TB the late Dr Norman Littler, Chest Consultant and TB Physician for North Devon (which was a Krebs pro-active culling area). Dr Littler, quoted in Hansard, recording debates in the House of Lords, stated categorically that contact, even direct, with an infected or infectious Badger could not constitute a danger to human health.

9. At the present moment vociferous sectional interests are spreading propaganda concerning the potential risk of human tuberculosis contacted from Badgers. This is a total un-scientific nonsense manipulated to frighten general public and denigrate the Badger. The Krebs Report produced no scientific evidence against the Badger and merely stated that “Circumstantial evidence was compelling”. This is a non-statement of no value.

CATTLE HUSBANDRY

10. The whole issue is due to the farmer’s bad husbandry. Many herds are so large in quantity that they cannot be managed by the few farm workers who look after them.

11. Cattle need to be over-wintered in proper ventilated quarters. It seems ironic that these cattle are the ones that are subject to TB when the cattle over-wintering in the fields where there are Badgers do not seem to be prone to the disease.

12. Cattle are sold or sent to abattoirs on the first signs of being sick instead of being tested.

13. Farmers have been brainwashed into believing that the Badger is the problem.

14. Bovine TB is a bovine problem. We should forget Badgers and concentrate on the Computerized Animal Identification Scheme for a better herd tracing.

February 2006

Letter submitted by Ben Bradshaw MP, Minister for Local Environment, Marine and Animal Welfare, Department for Environment, Food and Rural Affairs Committee (BTB 36)

1. I welcome the Committee’s decision to consider the Government’s consultation paper on badger culling as a bovine TB control measure.

2. I was interested in the reports of the discussions you had in your evidence session on 7 February, and particularly the issues that were raised around the evidence from the Independent Scientific Group on the Randomised Badger Culling Trial. I agree that we need a clear view on issues such as the impact that

improved culling efficiency might have on the levels of perturbation and disease incidence identified by the ISG. These are interesting issues and critical to clarifying the evidence on which we can base policy options and I would have wanted to discuss them with you if I had been asked to give evidence.

For the record, the main questions I have asked the ISG about their conclusions are:

- Would an increase in culling efficiency be likely to result in a larger overall beneficial effect on cattle herd breakdown levels, and reduce the edge effect?
- Is there likely to be a point at which increased culling efficiency could deliver a reduction in herd breakdowns which is more significant than the adverse impact in the areas outside the culling zones? Could this point be modelled from RBCT data?
- What impact on herd breakdowns has there been within the culling areas in areas where there has been no landowner consent to cull? Is there evidence of internal edge effects?
- Is there any evidence of perturbation from other badger culling operations and, if so, did it translate into an increase in cattle herd breakdowns?

February 2006
