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Cabinet Secretary for Environment and Rural Affairs



Llywodraeth Cymru  
Welsh Government

Mark Reckless AM  
Chair  
Climate Change, Environment and  
Rural Affairs Committee

23 March 2017

Dear Mark

**Climate Change, Environment & Rural Affairs Committee, action arising from discussion on bovine TB**

Following the evidence session on bovine TB on Wednesday 14 December 2016 I attach the additional information requested by the committee on –

- The total funding for the Bovine TB eradication programme, including a breakdown of the amount spent on testing, eradication and compensation and an indication of how much of it is EU funding (Attached at Doc 1).
- Discussions with DEFRA on the 2km buffer zone around culls near the border with Wales. (see below link, guidance to Natural England from Defra).

[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/489845/badger-culling-guidance-ne.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/489845/badger-culling-guidance-ne.pdf)

- Evidence of the perturbation effect following culling of badgers, how it has been interpreted by Defra and the Welsh Government and how this has influenced respective approaches to bovine TB eradication. (Attached at Doc 2).

The CVO Wales apologises for the delay in getting this information to you which was due to an internal administration issue.

I look forward to working with the Committee in the future on this very important issue.

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Ysgrifennydd y Cabinet dros yr Amgylchedd a Materion Gwledig  
Cabinet Secretary for Environment and Rural Affairs

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Rydym yn croesawu derbyn gohebiaeth yn Gymraeg. Byddwn yn ateb gohebiaeth a dderbynnir yn Gymraeg yn Gymraeg ac ni fydd gohebu yn Gymraeg yn arwain at oedi.

We welcome receiving correspondence in Welsh. Any correspondence received in Welsh will be answered in Welsh and corresponding in Welsh will not lead to a delay in responding.



## **CCERA Evidence of the perturbation effect following culling of badgers**

*The CVO agreed to provide a note to the committee on the evidence of the perturbation effect following culling of badgers, how it has been interpreted by Defra and the Welsh Government and how this has influenced their respective approaches to bovine TB eradication.*

### **Perturbation**

Perturbation has been defined as the disruption of the social organisation or structure of badger populations such as that which is caused where trapping/culling has taken place.

The hypothesis is that perturbation following badger culling may result in increased TB risk to spatially associated cattle herds due to increased contact and transmission of infection between badgers and increased contact between cattle and the socially disrupted badger population. Consequently perturbation has the potential to undermine any beneficial effects of badger culling on the incidence of cattle herd breakdowns.

### **The Randomised Badger Culling Trial (RBCT)**

The RBCT was a badger culling trial conducted in England between 1998 and 2005 which was overseen by the Independent Scientific Group (ISG). The RBCT was conducted in 30 areas of England, each located in a high-risk area for cattle TB and measuring approximately 100km<sup>2</sup>. The 30 areas were grouped into 10 sets of three, each called a 'triplet'. Within each triplet, one area was subjected to approximately annual culling across all accessible land ('proactive culling'), and in one area the badgers were culled locally on and near farmland where recent outbreaks of TB had occurred in cattle ('reactive culling'). The remaining area received no culling ('survey only') and acted as an experimental control with which the culling treatments could be compared. Treatments were assigned to trial areas at random.

The design of the RBCT followed closely general principles well established in numerous fields, the use of triplets achieving comparisons that were between geographically fairly closely related areas and the replication enhancing precision. Randomisation, rigorously enforced (except in Triplet I due to security concerns), was judged essential to avoid bias and, in particular, accusations of prejudiced allocation.

However, the validity of the trial design and interpretation of its findings have been subject to much discussion since the ISG published its Final Report. The fact that the trial was undertaken in areas within which varying degrees of badger culling had previously taken place has led to the question about what impact this might have had on the results and would different results be expected in areas without prior disturbance. In addition, co-operation with culling was variable across the triplets.

The trial was interrupted due to the 2001 Foot and Mouth Epidemic and as indicated above the delivery was at least in part influenced by security concerns. Furthermore, the ISG reported in October 2003 that reactive culling was associated with an

estimated 27% increase in the incidence of confirmed cattle herd breakdowns. Although the ISG recommended that the culling operation be allowed to continue until the start of the next closed season (1 February 2004) to allow further analysis to be undertaken in advance of the end of the next closed season. Ministers took the decision to suspend reactive culling from November 2003 due to this increase in incidence.

The question has been asked (More and McGrath 2015) as to the degree to which the RBCT results can be extrapolated to other areas of England and Wales, with differences between similar studies undertaken in the Republic of Ireland and the RBCT suggesting that geographical differences exist, at least at a larger (island level) scale.

**Table 2.1: Dates of key operations in establishing and implementing triplets.**

Triplet	Dates				
	Initial mapping of trial areas	Beginning of surveying	Treatment allocation	Completion of the initial proactive cull	Completion of the first reactive cull
<b>A Gloucs/Hereford</b>	11-Jun-98	08-Aug-98	20-Apr-99	28-Jan-00	Jul-00
<b>B Cornwall/Devon</b>	11-Jun-98	28-Aug-98	11-Nov-98	13-Dec-98	Jun-99
<b>C East Cornwall</b>	10-Mar-99	30-Mar-99	13-Sep-99	29-Oct-99	May-00
<b>D Hereford</b>	19-Mar-99	04-May-99	11-Nov-02	18-Dec-02	Sep-03
<b>E North Wiltshire</b>	05-Oct-99	08-Nov-99	27-Mar-00	26-May-00	Jun-02
<b>F West Cornwall</b>	04-Nov-99	05-Jan-00	24-May-00	18-Jul-00	Aug-02
<b>G Derbys/Staffs</b>	15-Mar-00	06-Jun-00	03-Oct-00	10-Nov-00	Aug-02
<b>H Devon/Somerset</b>	15-Mar-00	10-May-00	20-Oct-00	15-Dec-00	Jan-03
<b>I Gloucestershire</b>	10-Nov-00	05-Dec-00	13-Sep-02	08-Oct-02	May-03
<b>J Devon</b>	10-Nov-00	29-Nov-00	06-Sep-02	18-Oct-02	–

Note: no reactive culling took place in triplet J.

It should be noted that no reactive culling took place in Triplet J due to the premature cessation of this component of the trial and the number of years in which reactive culling took place within each triplet also varied. Triplet B was the only triplet that had four years in which reactive culling was delivered. Two triplets had three years, four had two years and two had just one year of reactive culling. The table below summarises this.

**Table 2.5:** Approximate dates of reactive culling, by triplet and culling year (defined to run from 1 May – 31 January). Reactive culling operations occurred between the dates indicated. Triplet J was eligible for reactive culling in 2003 but no culls had been performed when the reactive treatment was suspended in November 2003.

Triplet	1999	2000	2002	2003
A		Jul-Nov 2000	Jan 2003	May 2003
B	May–Dec 1999	Aug–Sep 2000	Sep 2002–Jan 2003	May–Jul 2003
C		May–Aug 2000	Jul 2002–Jan 2003	May 2003
D				Aug–Sep 2003
E			Jun 2002–Jan 2003	Jul–Oct 2003
F			Jul 2002–Jan 2003	Jun–Sep 2003
G			Aug 2002–Jan 2003	Sep–Oct 2003
H			Jan 2003	Sep–Oct 2003
I				May–Sep 2003
J				

The RBCT showed that culling caused disruption to the social structure of badger groups:

- their foraging ranges expanded and there was more overlap of social group territories.
- there was more frequent immigration to fill the void left from culling
- a higher prevalence of TB was found in the remaining badger population
- lower genetic relatedness.

The hypotheses based on these findings was that the increased prevalence of disease in the remaining badger population and the greater ranging could increase the opportunity for transmission and so cause the observed increase number of cattle breakdowns as seen in the 2km buffers around proactive culling areas and in the reactive culling areas.

The conclusion from the RBCT was that localised badger culling not only fails to control TB in cattle but can actually increase the incidence.

### **Proactive culling**

In the post-trial period to 28 March 2013 (report to Defra, Christl Donnelly Imperial College London, 16/10/13) the incidence of confirmed breakdowns inside the proactive trial areas on average was 25.9% lower than that inside survey-only trial areas (there was significant variations between triplets however). Analyses stratified by 6-month periods indicate that beneficial effects within trial areas remain in the latest 6-month period analysed (73 to 78 months post-trial). These latest results are consistent with an ongoing, but diminishing, benefit of proactive culling continuing through this latest period.

## Reactive Culling

Reactive (localised) culling was designed to target badger social groups which could have caused specific TB breakdowns in cattle. Since it entailed removal of only moderate numbers of badgers, it was expected to be both cheaper and more publicly acceptable than more widespread culling.

In the reactive areas badger culling was to be undertaken only once over eight consecutive nights on the occurrence of a new confirmed herd breakdown and with the aim of removing all social groups of badgers having access to the breakdown farm. No specific consideration was given to whether or not badgers were implicated in the breakdown.

In the recommendations and conclusions section of its final report (published in 2007) the ISG stated that:

*It is highly unlikely that reactive culling – as practised in the RBCT – could contribute other than negatively to future TB control strategies (10.3-10.4).*

Subsequent analysis showed that in the time period from one year after the last proactive cull to 28 March 2013 (the post-trial period), well after the final reactive culling was undertaken in 2003, the incidence of confirmed breakdowns **in the reactive culling** areas was 8.2% lower (95% CI: 26.4% lower to 14.5% higher) than in survey-only areas.

## Proposals for badger removal operations in Wales

In Wales, where it is believed that badgers are contributing to the persistence of TB in chronic breakdown herds, measures need to be implemented to break the badger to cattle route of transmission.

The delivery model we are proposing for the removal of badgers is not a repeat of the reactive cull element of the RBCT. The trap, test and removal operations being planned will be restricted to TB affected premises where veterinary epidemiological investigation indicates that infection of badgers on breakdown premises is the likely reason for a failure to eliminate infection from an associated cattle herd. There was no such consideration given in the RBCT. The removal of badgers will only take place once a TB test positive badger has been disclosed. Again, this differs from the RBCT where no attempt was taken to establish the infection status of badgers within the reactive culling triplets prior to their removal.

In the RBCT reactive culling operations were undertaken just once at the farm level over eight consecutive nights. Our intention is to repeat the operation and not to be restricted by eight nights of cage trapping where indications are that trapping efficiency can be improved by extending this period.

Evidence emerging from the recent All Wales Badger Found Dead Survey is that the TB prevalence in badgers in the areas where we intend to operate is not expected to be as high as that seen in the RBCT areas. The proportion of badgers found dead

identified as having TB has fallen in Wales since a previous survey was conducted in 2005/06. We have been testing all cattle herds in Wales at least once a year since 2010 and have built up a much clearer picture of the disease across Wales. There is significant spatial heterogeneity with disease clustered in some areas and almost absent in others. As such a more widespread proactive cull of badgers in Wales seems difficult to justify. We will be applying the badger removal operations alongside a suite of enhanced cattle and biosecurity measures to clear disease from the herd. Because the badger intervention we propose to make differs from previous badger interventions in Wales, close monitoring and reviewing of the outcomes for the co-located herds will be an important part of the work and inform future policy development.

### **Evidence to measure effect**

We have good evidence that social perturbation in badger populations happens in the wake of culling operations and it is a plausible explanation for the observed outcomes of the RBCT. However, we have little information on what perturbation looks like at the local scale or how changes in the number of badgers removed affects the level of perturbation and exactly how it relates to epidemiological outcomes.

As part of our badger removal operation we will gather data to:

- examine the effect on the status of the chronic breakdown herd (though this will can only be measured as a result of the combined measures applied)
- examine the effect on incidence in the surrounding cattle herds
- better understand the effect on the social structure of badgers
- measure the prevalence of TB in the remaining badger population
- using the panel of results, continue to evaluate the performance of the Dual Path Platform (DPP) trap side test, and review and adapt our removal policy if the resulting evidence deems it necessary.

We will work with colleagues in the Animal and Plant Health Agency (APHA) to develop processes to gather data and develop systems to analyse the results to achieve this.

### **Culling in England**

In 2011 the then Government in England announced its decision to proceed with a policy of enabling farmers and landowners to cull badgers under licence in areas of high incidence of TB in cattle. The Government would bear the cost of licencing and monitoring the culls but the industry would bear the costs of undertaking the culls.

*Dr Malla Hovi from Defra gave evidence at the committee meeting on 08/12/16.*

Summary of expenditure and receipts (receipts indicated as a negative figure) to show the EU income as a percentage of expenditure:

<b>Year</b>	<b>TB Programme Delivery</b> (includes TB testing and general TB Eradication Programme policy development and delivery)	<b>Valuation Haulage Slaughter Disposal</b>	<b>Salvage received</b>	<b>Compensation paid</b>	<b>Total Expenditure</b>	<b>EU Income received</b>	<b>EU Income as % of Total Expenditure</b>
2011/12	£16,761,000	£826,000	-£1,540,000	£13,284,000	£29,331,000	-£3,220,000	10.98%
2012/13	£16,944,000	£835,000	-£2,020,000	£17,024,000	£32,783,000	-£3,910,000	11.93%
2013/14	£12,844,000	£619,000	-£1,462,000	£11,761,000	£23,762,000	-£3,190,000	13.42%
2014/15	£12,411,000	£712,000	-£2,521,000	£10,905,000	£21,507,000	-£2,610,000	12.14%
2015/16	£13,929,000	£850,000	-£2,846,000	£14,480,000	£26,413,000	-£3,990,000	15.11%