Department for the Environment, Food and Rural Affairs

Bovine TB - Key conclusions from the meeting of scientific experts[1], held at Defra on 4th April 2011

This note summarises the key conclusions from a meeting between Bob Watson (Chief Scientific Adviser, Defra), Nigel Gibbens (Chief Veterinary Officer, Defra), and the following external contributors:

Professor Christl Donnelly, Imperial College London
Professor Chris Gaskell, Royal Agricultural College
Professor Charles Godfray, University of Oxford
Professor Lord John Krebs, University of Oxford (by telephone)
Professor Sir John Lawton, University of York (by email)
Professor David Macdonald, University of Oxford
Professor Lord Robert May, University of Oxford (by email)
Professor Quintin McKellar, University of Hertfordshire
Professor Mark Woolhouse, University of Edinburgh

Key conclusions:

1. The science base generated from the RBCT shows that proactive badger culling as conducted in the trial resulted in an overall beneficial effect compared with 'survey only' (no cull) areas on reducing new confirmed cattle herd breakdowns which is still in evidence 5½ years after the final annual proactive cull[2].

2. The initial detrimental effect on confirmed herd breakdowns observed in the RBCT at the outside edge of the culled areas diminished over time and since 12-18 months after culling stopped confirmed bovine TB (bTB) incidence in cattle is similar to that seen in the survey only areas.

3. The RBCT provides the best scientific evidence available from which to predict the effects of a future culling policy. Informed expert opinion suggests that the more that a future culling policy deviates from the conditions of the RBCT - e.g. industry versus government led and/or culling methods (such as permitting controlled shooting of badgers in addition to cage-trapping), the more likely it is that the effects of that policy will differ, either positively or negatively, and with potential variability in outcome between areas.

4. If culling is not conducted in a coordinated, sustained and simultaneous manner according to the minimum criteria, then this could result in a smaller benefit or even a detrimental effect on confirmed cattle bTB incidence. [N.B. the minimum criteria are defined as: covering at least 70% of the land within the culled area (based on RBCT experience), a minimum area of 150km^2 (based on analysis and extrapolation of RBCT

[1] The meeting focussed on scientific issues and did not discuss economic, ethical and safety issues

[2] **During the trial period of the RBCT**, incidence of confirmed breakdowns in proactive culling areas was 23.2% lower (95% confidence interval: 12.4% to 32.7% lower) than in survey-only areas. In areas up to 2km outside proactive trial areas, incidence of confirmed breakdowns was 24.5% higher (95% CI: 0.6% lower to 56.0% higher) than in areas up to 2km outside survey-only areas.
From one year after the last proactive cull to 25 February 2011, incidence of confirmed breakdowns in proactive culling areas was 31.5% lower (95% CI: 19.1% to 42.0% lower) than in survey-only areas. In areas up to 2km outside proactive trial areas, incidence of confirmed breakdowns was 4.4% lower (95% CI: 27.4% lower to 26.0% higher) than outside survey-only areas.
From the start of the RBCT to 25 February 2011, incidence of confirmed breakdowns in proactive culling areas was 27.4% lower (95% CI: 20.2% to 33.9% lower) than in survey-only areas. In areas up to 2km outside proactive trial areas, incidence of confirmed breakdowns was 8.3% higher (95% CI: 14.6% lower to 37.4% higher) than outside survey-only areas.

data), sustained for a minimum of four years (based on RBCT estimates), and conducted simultaneously as defined as within a six-week period each year (based on advice of the combined Defra SAC and SAB[3])]

5. Culling conducted in line with the minimum criteria could be expected to lead to a relative reduction of confirmed new incidents of bTB in cattle herds in the local area. Even though it is not possible to give a very precise estimate, it is likely that the confirmed incidence of bTB in cattle within the culled area would be reduced relative to unculled areas by between 20-34% (see footnote 2) after 9.5 years (4 years of culling plus 5.5 years post-culling). However when taking into account the 2km perimeter area, for an idealised 150km^2 area the average net benefit over 9 years would be smaller, at about 3-22%, with a central figure of 12.4% (assuming the incidence of bTB in cattle is similar inside the culled area and the 2km ring) or about 8-24% with a central figure of 16% (assuming higher incidence inside the culled area than the 2km ring)[4]. Benefits would accrue over time and would be relatively small (if any) in earlier years.
In order to have a significant impact on national disease incidence, culling would need to be conducted over a very large area (bTB is currently considered endemic in over 39,000km^2 of England – the area under annual bTB testing). The associated impact of culling at this scale on the national badger population is unknown.

6. The current trend for generally increasing bTB incidence in cattle clearly indicates that the current set of control measures is insufficient to bring about eradication of bTB in cattle. Existing control measures will not be fully efficient without effective measures to address transmission between badgers and cattle.

7. If culling is undertaken, it should be in addition to, not instead of, existing bTB control measures in cattle, which should be maintained and strengthened.

8. Monitoring the implementation and impact of any badger culling policy, and the management of expectations, is of key importance.

9. In the short term, ring vaccination around culling areas, or vaccination on non-participating land within culling areas, is unlikely to mitigate significantly against the badger perturbation effect on the incidence of confirmed bTB in cattle such as that observed in the RBCT. However, in the medium to long term, vaccination in an area could reduce the disease level in the local badger population and thus the risk to local cattle from badger-to-cattle transmission. In addition, vaccination is highly unlikely to have negative effects.

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[3] A group of members from both Defra's Science Advisory Council and TB Science Advisory Body considered the consultation document and provided advice to Defra's Chief Scientific Adviser. This advice is available at http://sac.defra.gov.uk/2011/02/17/meeting-17th-february-2011/.

[4] The estimated average net effect of badger culling on confirmed cattle herd incidence depends on a range of factors, including the incidence of TB in cattle inside the culled area and in the 2km surrounding ring. If the incidence was 0.10 confirmed new incidents per km per annum inside and outside the culled area, the estimated average net beneficial effect in a 150km^2 area would be 12.4% (95% confidence interval -21.8% to -3.1%); if the incidence was 0.15 CNI/km/annum inside the culled area and 0.1 CNI/km/annum in the 2km surrounding ring, the estimated average net beneficial effect would be 16.0% (95% confidence interval -24.2% to -7.9%). What would be seen in reality would depend on specific local circumstances.
Note that figures for the estimated benefit within the culled area are from the most recent update (February 2011) which are for a total of 9.5 years (5 years culling, 4.5 years post-cull). Estimates of the net benefits calculated for the 150km^2 area and 2km surrounding ring are based on RBCT post-trial analyses data reported in July 2010 and are therefore for a total of 9 years (5 years culling, 4 years post cull).