

Response to Defra's consultation on controlling the spread of bovine tuberculosis in cattle in high incidence areas in England: badger culling

The Society understands the urgency of controlling the spread of bovine TB, the very great pressures Defra face from opponents and advocates of badger culling, and the importance of basing decisions on the best scientific evidence. However, we believe that it is also very important for Defra and for the public to understand that, despite the best efforts of the scientific community and Defra, the scientific evidence base relating to the epidemiology of bovine TB is limited.

Badgers are nocturnal mammals that live underground and individuals which are carriers of TB are frequently asymptomatic and difficult to diagnose. It is also difficult and expensive to conduct controlled experiments on these animals. As a result and despite considerable research by the UK's best zoologists and epidemiologists, much of it funded by Defra, the information upon which decisions can be made is poorer than for many other animal diseases.

That said, we believe there is reasonable agreement in the scientific community on a number of issues:

- Badgers are a significant reservoir of bovine TB and can transmit the disease to cattle.
- Certain badger culling regimes can reduce bovine TB outbreaks in cattle, as evidenced by the recent large-scale trials in the UK and Republic of Ireland.
- The Randomized Badger Culling Trial in the UK has provided evidence that disease outbreaks in cattle can increase in the vicinity of culling operations. The cause of this is not known, but a strong hypothesis is that this arises from the *perturbation effect* which suggests that culling disrupts badger social structure in a way that spreads the disease.
- Cattle-to-cattle transmission is a significant cause of disease outbreaks.
- Physically separating badgers and cattle (biosecurity) on farms will reduce transmission.
- Investment in research on better diagnostics is highly desirable.
- Investment in research on vaccines is also warranted, but is unlikely to produce viable solutions in the short term.

Thus to cope with the current crisis we believe there is clear scientific support for measures to reduce cattle-to-cattle transmission, improve biosecurity (eg decrease badger to cattle contact) and improve diagnostics. Investment in any of these, along with research on vaccines, is likely to do good and is unlikely to do harm.

The case for badger culling is much less clear cut: both positive and negative consequences of the introduction of culling can be envisaged. Which of these will predominate depends in a complicated and hard to predict way on the details of the culling regime adopted. We note that most experts believe that, due to the perturbation effect, geographically local and relatively non-intensive culling is unlikely to reduce the incidence of bovine TB. There is some evidence to suggest that culling would need to occur over at least 300km² to result in a net decrease in badger to cattle TB transmission rates. Culling badgers over such a large area would require serious consideration of the impact on the conservation status of badgers. In summary, it is important to understand that the scientific evidence base is insufficiently detailed to provide precise guidance on different possible culling regimes.

Inevitably, Ministers will have to make policy decisions that are driven more by social, economic and political considerations than by the available scientific evidence, and we repeat that we believe it important that the limitations of the science are properly acknowledged.

In the event that Defra does decide in favour of badger culling the Royal Society encourages the Department to institute monitoring and reporting programmes to ensure that any impacts of culling on non-target species and on rural ecology are identified and fed back into the decision-making process.

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