

Letters & Notices



BOVINE TB

Badger culling to control bovine TB

WE write to express our concerns about significant methodological flaws in Langton and colleagues' analysis of the effect of badger culling on cattle bovine TB (bTB) herd incidence.

The analysis has been carried out in a manner that masks the effect of culling by incorrectly grouping data, which makes it impossible to assess the impact of culling on cattle TB breakdowns.

For each year analysed, Langton and colleagues combine data for areas where culling commenced that year with areas with a longer history of culling. This is an inappropriate grouping of data because it is known that the impact of culling on cattle outbreaks takes some time to appear,² typically two years. The area being culled has increased through the past seven years so, for each year analysed, a relatively large area of newly culled land, with a higher bTB incidence, is included in the total culled area in Langton and colleagues' analysis.

This has the effect of masking trends in herd breakdown incidence like the statistically significant decreases observed previously³ in areas where culling has been underway for several years.

The flawed combination of data prevents Langton and colleagues from being able to assess their null hypothesis: that culling has no association with the incidence of Officially Tuberculosis Free – withdrawn (OTFw) herd breakdowns.

It is possible to reduce these problems and test the null hypothesis with a more appropriate analysis of the same type of data as used in this paper.¹ Using the most recent published data,^{4,5} we looked at cull areas by the year culling started, and assess breakdowns in these areas in subsequent years. Unculled areas are limited to those where no culling took place during the entire period being considered. Apart from this change in the grouping of data, we use similar assumptions as Langton and colleagues to enable a straightforward comparison. Our analysis indicates a clear reduction in OTFw cattle

“Culling in an area does correlate with subsequent decreases in OTFw incidence in that area”

breakdowns, relative to uncultured areas, in culled areas from cull year 2 onwards (Fig 1). For example, TB incidence in the areas where culling started in 2016 has dropped from 17.2 OTFw breakdowns per 100 herd years at risk in 2016/17, to 8.7 in 2019/20. Similarly in the areas where culling started in 2017 it has dropped from 15.3 in 2017/18 to 8.4 in 2019/20. In contrast, in the parts of the high-risk area (HRA) where no culling took place incidence has fluctuated from year to year and has only declined from 15.4 in 2015/16 to 13.4 in 2019/20.

This analysis demonstrates the impact of the flawed approach of Langton and colleagues, negates the conclusion of that study, and indicates that culling is associated with a reduction of cattle TB cattle breakdowns in the HRA, as seen in previous studies.

In the second half of their paper the authors do not carry out any statistical analysis, simply stating that the peak of TB incidence does not coincide with the year the first cull started in a given county. Such group-level correlations are open to inferential errors through failing to account for confounding variables.

We agree with the authors that OTFw incidence is declining across the HRA, and that increased controls on cattle movements, testing and biosecurity will have contributed to this success. These are important components of our bTB eradication strategy. In the context of these increased cattle controls, we don't regard it as surprising that incidence rates in an entire county do not alter on the date culling started in some parts of that county. As demonstrated by the analysis in Fig 1, culling in an area does correlate with subsequent decreases in OTFw incidence in that area.

More in-depth statistical analysis of the effect of badger culling on cattle TB incidence is underway at the APHA and will be submitted for peer-reviewed publication in due course. This will take into account differences between areas (including confounding factors)

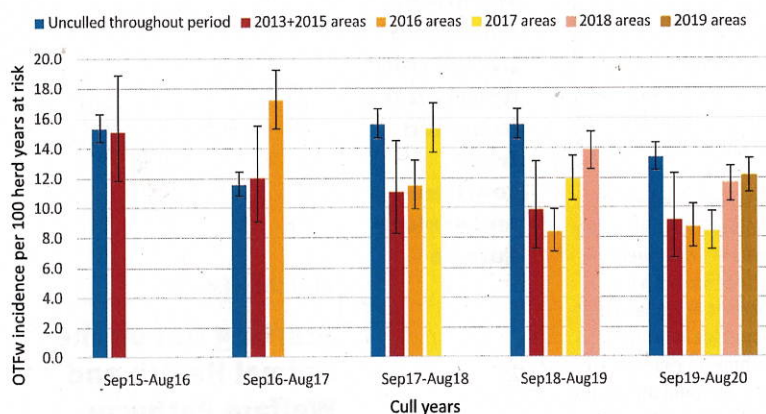


Fig 1: Annual Officially Tuberculosis Free – withdrawn (OTFw) incidence in the high risk area of England from 2015 to 2020. The data used are the most recently published dataset^{4,5} and contain no additional information from that used by Langton and colleagues,¹ except for inclusion of the most recent year of data (September 2019–August 2020). The blue bar represents areas where no culling occurred during the entire period. Other colours show areas where culling commenced in a particular year. Note, for instance, that areas where culling started in 2016 (orange bars) had high incidence when culling started, but significantly lower incidences than uncultured areas in subsequent years. A similar pattern is observed for the areas that started in other years

that can affect the measured impact of culling.

We appreciate that the badger cull is a controversial topic. It is important that this debate is informed by the best analysis possible. More appropriate analysis of present data indicates the effectiveness of culling in the HRA in reducing cattle TB incidence.

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References

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- 2 Jenkins HE, Woodroffe R, Donnelly CA. The duration of the effects of repeated widespread badger culling on cattle tuberculosis following the cessation of culling. *Plos One* 2010;5:e9090
- 3 Downs SH, Prosser A, Ashton A, et al. Assessing effects from four years of industry-led badger culling in England on the incidence of bovine tuberculosis in cattle, 2013–2017. *Sci Rep* 2019;9:14666
- 4 APHA. Bovine TB in cattle: badger control areas monitoring report. For the period 2013 to 2020. <https://bit.ly/3CE6Y5P> (accessed 10 March 2022)
- 5 APHA. Bovine TB epidemiology and surveillance in Great Britain, 2020 Bovine tuberculosis in Great Britain. Surveillance data for 2020 and historical trends. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1027592/tb-GB-data-report-accessible-2020.ods (accessed 15 March 2022)

■ A response by Langton and others will be published in a subsequent issue of *Vet Record*.

PARASITOLOGY

Surveillance for exotic worms and worm-like parasites

PET travel, growing pet importation and expansion in global parasite distribution are all increasing the risk of exotic parasites entering the UK. The European Scientific Counsel Companion Animal Parasites (ESCCAP) UK & Ireland and the APHA are being alerted to increasing numbers of various worm and worm-like parasites

in dogs being imported from southern and eastern Europe. These include the eye worm *Thelazia callipaeda*, skin worm *Dirofilaria repens* and the nasal pentastomid *Linguatula serrata*. All three of these parasites are zoonotic with the potential to establish in the UK. Their diagnosis relies primarily on identification of adult parasites found on clinical examination, which is vital to improve prognostic outcomes in infected dogs and to minimise the risk of establishment in the UK.

The eye worm *T callipaeda* is a whitish filiform, 7–17 mm in length. Although often subclinical, ocular thelaziosis can cause conjunctivitis, keratitis, epiphora, eyelid oedema and, in serious cases, blindness. Close examination of the conjunctiva can reveal worms actively moving on the surface (Fig 1).

Adult *D repens* filariae can be found in subcutaneous nodules which are 3–6 cm in diameter and are usually soft with serohaemorrhagic contents. Adult worms are whitish and 5–15 cm in length (Fig 2).¹

L serrata lives in the nasal airways of dogs where it is responsible for mild to severe rhinosinusitis. Adult worms may be expelled from the nose during sneezing or discovered during endoscopy.

The APHA and ESCCAP UK & Ireland are collaborating to encourage diagnosis and reporting of these parasites and to map the distribution of cases. This will help to inform their distribution and prevalence as well as helping to identify where autochthonous transmission may be occurring.

The APHA will carry out free-of-charge morphological identification of suspected cases of *T callipaeda*, *D repens* and *L serrata* seen in veterinary practices in England and Wales. We encourage veterinary practices to submit any samples that may be one of these parasites to the APHA for identification. Samples should be posted to the APHA Carmarthen Veterinary Investigation Centre. Sample submissions must be accompanied by a full clinical history to qualify for free testing. Further information on how to submit them can be found at <http://apha.defra.gov.uk/vet-gateway/surveillance/experts/>



Fig 1: Clinical infestation with *Thelazia callipaeda* in a dog.

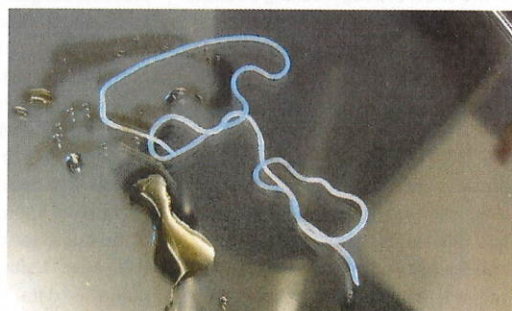


Fig 2: Macroscopic view of an adult of *Dirofilaria repens*, which can be found in subcutaneous nodules

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Reference

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ANIMAL HEALTH

Starting out on the Animal Health and Welfare Pathway

YOU will hopefully have read about George Eustice's speech at the recent NFU conference, in which he set out plans for the Animal Health and Welfare Pathway – a programme of financial support for farmers in the pig, cattle, sheep and poultry sectors, based around key animal