



Vision for a Bovine Tuberculosis Control and Eradication Strategy

Country Land and Business Association

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COUNTRY LAND AND BUSINESS ASSOCIATION

VISION FOR BOVINE TB CONTROL AND ERADICATION STRATEGY

The CLA's vision is for a healthy countryside with *all* susceptible species free from Bovine TB.

To achieve this we need:

- Immediacy of action
- Integrated measures by all parties and on all fronts
- Tried and tested methods – to ensure efficacy of control
- Persistency of control – to ensure that the disease does not escalate again
- Variety of measures – to achieve maximum disease control allied to appropriateness and cost
- The maintenance of fair and proper compensation to affected businesses

Present Situation

We recognise that we are in a crisis situation. In 1997, a mere 8 years ago, less than 1% of the national herd was affected with bovine TB (*Mycobacterium bovis*); in 2004, almost 6% were affected.¹ In 1997, there were 500 herds affected; by 2004, it was over ten times that amount and over 5200 herds were affected².

These figures are an indictment of past control policies. They reflect the almost 20% year on year increase³ which has occurred since the cessation of the clean ring strategy in 1986.

In 1997 almost 28% of badgers examined by Defra were found to be infected with *M. bovis*⁴. Figures since then are unavailable due to the Randomised Badger Culling Trials (RCBT). Subsequent study by the Central Science Laboratory (CSL) has confirmed the presence of bTB in a wide range of wild mammals, including deer, fox, stoat, polecat and various other small mammals⁵. *M.bovis* has also been confirmed within other species including domestic cats⁶⁷, and, most recently, in pigs.

The presence of wildlife vectors has both complicated and obfuscated control of bovine TB. Interest groups have sought to play down the role of one vector or another, or to point the finger at alternative sources of disease; government policy has veered towards appeasement with a lighter and lighter touch towards wildlife causes, whilst scientific studies confirm the complexity of the disease, and the need for effective and comprehensive control across both cattle and wildlife.

CLA is not of the view that there is one simple cause for the spread of the disease. We are not a single interest group which believes that solely cattle or (depending on the viewpoint) wildlife are responsible for disease spread. Rather, we recognise the complexity of the disease, its transfer between species and the need for comprehensive

action across species. We seek the control, and eventual elimination of bTB for the benefit of both animal, as well as human, health.

The past eight years have provided an object lesson in reliance on control of *M.bovis* in one species alone – cattle. The failure of this control policy, and the exponential increase in bTB that has resulted, demonstrates the need for a change in strategy. We are pleased that Defra has shown itself willing to consider alternative strategies, and welcome this opportunity to contribute to the “partnership” approach.

M. bovis in Wildlife

Badgers

Mycobacterium bovis was discovered in badgers by Muirhead in 1971 whilst investigations into an outbreak of bTB among young cattle on a farm in Gloucestershire were taking place. Classic TB lesions were discovered in a badger found dead in the field⁸, and subsequent investigations revealed TB to be widespread in badger populations⁹.

At the time of this discovery, the UK had been successful at reducing a national incidence of bTB in cattle from some 40% in the 1930s to less than 2% by the 1960s – a reduction achieved through the comprehensive testing and slaughtering programme. The discovery of *M.bovis* in badgers led to the establishment of the Thornbury trials. These, set up in a TB hotspot area, geographically bounded (by river and motorway), where TB incidence prior to the commencement of the trials was 8.2% in cattle, and 18.6% in badgers, had a history of TB outbreaks of obscure origin. Gassing of setts commenced there in 1975, and continued for the next six years, although most setts were cleared by 1976. Trapping and snaring was also carried out within this area and established that after 1976, when the majority of setts had been cleared, only some 5.4% of badger carcasses were infected¹⁰. In addition around 1000 other types of mammals were investigated and none were positive for bTB¹¹.

The gassing policy ceased in 1981, although setts continued to be monitored until 1988. By that time, setts had been re-colonised from the surrounding areas. Nevertheless, there were no incidents of bTB in cattle in that trial area between 1980 and 1991.

On the cessation of gassing, a “clean ring strategy” was introduced. This was more efficient than the gassing approach, and was operated on the basis that lactating females would be released. Badgers were trapped in setts on farms where TB outbreaks had occurred, and setts were then tested and cleared until non-infected setts were reached. This policy continued until 1986, by which time there were just 88 outbreaks, confined to hotspot areas. The last large scale area to be cleared under this strategy was the Hartland, Devon, area, where the fall in herd outbreaks from 15% in 1984 to 4% in 1985 was an improvement which was sustained for 10 years¹².

Results of tests on badger carcasses show that the percentage found positive for *M.bovis* was at its lowest between 1978 and 1981. From 1992 onwards, (until 1998, when figures were no longer released) between 20% and 28.1% of badger carcasses were infected with bTB¹³. This is similar to the figure found in 1975, prior to the commencement of the gassing policy.

Other countries have also trialled badger culling policies. The Irish East Offaly trial used snaring (with approximately 80% capture success rate) within an intervention area and compared the results of the control area. The trial operated over a seven year period and showed a fall in incidence within the intervention area of some 88%, against a fall of 38% within the control area and against a rise of 19% nationally¹⁴. Some culling was carried out within the control area in response to serious outbreaks of disease. The Irish Four

Area Trial¹⁵, conducted from 1997 to 2002 reported its findings in 2004. It sought to build on the earlier East Offaly trial, and operated over four areas with matched areas of intensive and proactive removal. It concluded that there was a significant difference between the intensive areas and the reference areas, with cattle herds in the intensive areas showing a 60 – 96% decrease in incidence of bTB.

The pathology of *M. bovis* varies markedly in the badger from cattle. Essentially, in cattle the vigorous aggressive reaction to the presence of the disease produces lesions, but with very few bacilli. The opposite occurs in the badger, as the reaction is mild, therefore lesions mature gradually, and, as the necrosis progresses, accumulate vast numbers of bacilli. In addition, necropsy examination of badgers has shown a significant proportion of cases yielding cultures of *M. bovis* from lymph node pools whilst showing no visible lesions (NVL) of the disease¹⁶. Whilst TB is essentially a disease of the lungs, in the badger the common site for secondary spread is the kidney¹⁷.

The significance of these differences becomes apparent when considering spread of the disease. The high bacillary counts in badger lesions result in heavily infected lung discharges coughed up with sputum, as well as swallowed discharges contaminating faeces, both of which will result in environmental contamination. Further, the high levels of kidney disease reported as secondary infection result in a further route for exit of infection.

The impact of this spread is not just on other species sharing the same environment, but on other badgers within that sett and familial group. A common feature of TB is its tendency to latency – a feature found frequently in man. The high proportion of badgers from which *M. bovis* may be isolated, but which have NVL is representative of latent infection. The activation of latent infection will occur in stress conditions – territorial pressures, social hierarchical pressures and nutritional stress.

The badger was made a protected species in 1973 and has been subject to increasing levels of protection ever since. Badgers numbers have risen steadily over the years, and although absolute estimates of total badger numbers vary, there is general agreement regarding an upward trend. The Mammal Society¹⁸ indicated a rise in badgers numbers in the order of 55% between 1988 and 1997. Although estimating methods were then changed, which impacted on actual population estimates, a further increase, of 57%, was indicated between 1995 and 2004. Taking into the overlap between these two periods, this indicates a doubling of the badger population since the late 1980s. The National Badger survey has previously indicated a 77% increase in badger numbers between 1980 and 1990.

The distribution of badgers varies widely throughout the country, with high population densities of up to 30 badgers per square kilometre in England compared with low density areas of 1 -2 badgers per square kilometre. In Scotland, the density is very low at 0.2 badgers per square kilometre¹⁹. Concern has frequently been expressed by some groups at the impact of culling on badger populations. Study work has indicated that re-population is dependent on a number of factors, including the capacity of the habitat to support badger populations, birth and death rates, the completeness of cull, and the size of badger population in the surrounding area from which re-colonisation will occur. Where partial culling took place, badger populations quickly recovered to pre-cull density within three years²⁰. Even where complete culling took place, populations returned to pre-cull levels within 10 years²¹. This latter study was in a high density area and consequently a greater numerical recovery was required.

Whilst the presence of *M. bovis* in the badger is, of itself, of concern, (deaths of badgers due to *M. bovis* are estimated at up to 40% of natural causes of death²²) its implication in the spread of disease to other species is of considerably more significance.

Failure to deal with this spread represents an unacceptable derogation of responsibility.

Deer

Recent study²³ has indicated *M.bovis* infection within deer at rates ranging from 1.0% (roe and red deer) to 4.4% (fallow) and 5.2% (muntjac). However, there was substantial variation in the prevalence of infection between areas. For example a prevalence of 2.7% was found for roe deer in an area of approximately 25 km² in Gloucestershire but was absent from those collected in an area over twice as large in the Mendips, Somerset.

Spatial clustering of *M. bovis* infection has been observed in wildlife populations and can therefore be problematic for the estimation and interpretation of prevalence data. The use of risk scores assists in assessing prevalence and the risk attached to spread of *M.bovis* from certain populations. Both fallow and red deer were assigned the highest risk scores on the basis of the likelihood of excreting bacilli, the prevalence of infection, the habitat preferences of red and fallow deer (which favour agricultural grasslands) and the widespread prevalence of both species.

Nevertheless, little is still known of the extent to which habitat is shared between deer and cattle, a factor which will be crucial in determining transfer between the species.

The report notes, however, that "*none of the estimates of M. bovis prevalence for wild mammals in the present study approach those observed in badgers*". Prevalence estimates of up to 5% fall well short of infection rates detected in badgers which are in excess of 20%²⁴. The report continues: "*In addition, badgers are known to excrete potentially large numbers of bacilli and to forage on pasture and in buildings used by cattle*".

In terms of transmission of *M.bovis* it is clear that a small percentage of deer are infected with the disease. However, the pathology of the disease in deer differs from that of the badger, in that bacilli are not excreted in the large numbers. Observation shows that deer will graze pastures also grazed by cattle (although this grazing is not necessarily alongside cattle). In the complex transmission of *M.bovis* between species, the study offers no conclusions as to whether deer will transmit to cattle, or whether, as seems equally possible, deer are also unwitting recipients of disease excreted widely into the environment by badgers.

M.bovis in Cattle

The current testing programme ensures that virtually all cases of *M.bovis* in cattle are identified prior to the animal showing any visible symptoms of the disease. Since 1990, there has been only one reported case of clinical TB in a person under 25 years old caused by infection with *M. bovis* and which is likely to have been caught directly from cattle in the UK²⁵.

Pastuerisation has effectively prevented much of the transfer to humans, and the risk to human health currently posed by *M. bovis* in the UK is "very small"²⁶. Greatest risk is believed to attach to those drinking unpasteurised milk, and to those handling carcasses of cattle or wildlife.

Research has indicated that clinical disease probably occurs in a relatively small, but undetermined, proportion of cattle exposed to *M.bovis*²⁷. Furthermore the genetic susceptibility to *M.bovis* varies between families and species, although not between breeds, but also increases with age²⁸. Exposure to infection will not necessarily lead to development of the disease. The extent to which cattle to cattle transfer takes place, and

the risks associated with it can be attempted from extrapolation of infection data, but such attempts will fail, by virtue of such extrapolation, to exclude additional risk variables and as such, cannot be deemed rigorous.

Much speculation has been made, particularly by single interest groups, as to methods of cattle management, practices and welfare in the transmission of and susceptibility to *M.bovis*. Few of these claims appear to be supported by hard fact.

However, there are areas where improvements could be made in identification and the prevention of transmission of disease. These are outlined below.

Need For Action

The complexity of the science of *M.bovis*, demands for “sound science” and the gaps in the knowledge base all combine to create a vacuum which research can happily occupy whilst disease escalates. There is no timescale as to when this knowledge might reasonably be filled. And in the interim, the disease continues its exponential increase.

CLA believes that the most pressing immediate need is to stop the year on year increase in bTB incidence. The benefit to so doing will be felt in both improvements in the health of cattle and wildlife alike, as well as to the Treasury. A continuance of existing policies, or policies very like them, can, at best, achieve little more by way of control than is already being achieved. Whilst there is hope of new control techniques, new methods of identifying disease, new vaccines, for the immediate present the focus must be on those techniques which have been proven to reduce disease incidence.

CLA is completely clear that what needs to be tackled is not wildlife numbers or species, or cattle management techniques – it is about fighting a complex, potentially highly dangerous zoonosis – a **disease**.

The present increasing levels of bTB serve to make eradication increasingly difficult. But the need to protect animal, as well as human, health, means urgent, concerted and sustained action must be taken.

STRATEGY

CONTROL IN CATTLE

The aims of any control strategy must be:

- to identify at the earliest possible stage the presence of bTB
- to prevent the spread of disease
- to seek the earliest possible eradication of the disease

Identification of disease

The EU lays down rules for the testing of animals, compliance with which ensures the official “TB free” status of both a herd and a Member State (or part of a Member State). Present testing intervals are defined on a parish basis. However, the continued legality of this must be questionable given present levels of bTB in the various regions. With average levels of bTB across Great Britain at 5.7%, rising to almost 15% in the western region (yet where two and three year testing parishes still apply) and with rates even in Scotland and the Eastern regions of between 0.5% and 1.0% being recorded, the need to urgently review testing intervals across all regions must surely be a priority.

We note that the EU seeks eradication, not merely control, of bTB.

We recommend: the implementation of EU testing intervals as calculated on a Member State, rather than parish, basis as intended by EC Directive 64/432, as amended. The parish based/regional approach can no longer be justified and is unsustainable.

Prevention of spread

Pre- Movement Testing

We remain unconvinced by the report of the Pre-Movement Testing Stakeholder group which failed to take full account of the speed at which the disease is spreading, and which assumed, cavalierly, that containment will be sufficient to prevent further spread outside the “hot spot” areas.

The report failed to take account of known deficiencies in the existing skin test, and failed to fully recognise the reduction in confidence that pertains when the test is applied on an individual, rather than a herd, basis.

The effect of implementing these pre-movement testing recommendations will be to create a divisive, significantly deleterious effect on those regions required to implement these recommendations, whilst affording false confidence to those areas (three and four year testing areas) not required to so implement.

It will have a significant adverse effect on livestock markets and other methods of trading, whilst failing to offer suitable guarantees as to improvements in herd health.

It fails to address the potential for spread within the country outside the pre-movement testing areas. From a disease control standpoint it is clear that there is a need to ensure that animals are not seeded into potentially “clean” areas where disease can subsequently be spread. The present proposals enable the movement of so-called “clean” cattle (which have passed a pre-movement test) into four yearly testing areas (and where the next test may not be for that full four years) and will provide a false level of confidence to purchasers whilst enabling disease to spread unchecked.

In a situation where the overall level of disease is low, then the risk factors associated with such pre-movement testing would probably enable a reasonable level of confidence to be assigned to such testing and movement. In the present situation, these measures are not merely inadequate, they succour false confidence, create divisive and deleterious impacts and could contribute to potential spread of disease.

If Defra is truly concerned at stopping this disease, then **we recommend:**

- **pre-movement testing proposals should be abandoned**
- **greater use should be made of shorter routine testing intervals nationwide**
- **consideration should be given to isolation and post-movement testing which offers better disease control than pre-movement testing**
- **isolation and post- movement testing also has benefits for the identification and prevention of spread of other diseases, which may not occur if government lends support to the less effective pre-movement test**
- **guidance should indicate the importance of purchasing from recently tested herds, and the need for stringent isolation prior to post movement test**
- **date of last clear test should be provided by vendors and at markets to enable purchasers to consider disease implications**
- **the benefit to the UK, through decreased incidence of disease, consequent reduced compensation, and decreased risk to public health justifies the government shouldering the burden for these testing costs**

Herd Health Measures

Herd health plan measures (including isolation and testing) are already adopted in many herds who recognise the benefits of preventing a variety of diseases. Plans are also encouraged by farm assurance. Take up will be enhanced by a visible commitment by government to tackling all aspects of bTB, including in wildlife.

We recommend: visible commitment by Defra to a partnership approach to encourage and support those livestock keepers who make every effort to prevent disease contamination of their herd

CONTROL IN WILDLIFE

That wildlife carry *M.bovis* is indisputable. That many different species carry *M.bovis* is also not disputed. The ability of the badger to excrete vast numbers of bacilli, its known habits at entering buildings and feeding areas, and the appearance of *M.bovis* in closed herds all serve to implicate the badger as a means of transmission of the disease. This does not mean that it is the only route for transmission. However, given the absence of wildlife controls over the last eight years and a corresponding exponential increase in disease in cattle, coupled with detailed investigative studies which have shown significant reduction in disease incidence as a result of badger culling (an effect that is not noticeable in the absence of wildlife controls despite cattle culls in excess of 20,000 animals), there is sound evidence to implicate the badger in the spread of the disease.

It is postulated²⁹ that infection is likely to have seeded into badger populations at a time when the disease was rife throughout the country (the latter part of the 19th and early part of the 20th centuries). Certainly, the adaptation to infection exhibited by the badger may be evolutionary. However, that adaptation has resulted in the badger becoming an excellent maintenance host for the disease.

The CLA wishes to see the reduction and eventual elimination of bTB. We are concerned about the current spread of this *disease*. We have no particular axe to grind against the badger. However, we do firmly believe that the implication of the badger in the spread of disease means that the government must act. Just as it would be entirely inequitable, as well as ineffective, if all attempts at disease control were focused on the badger, so it is entirely inequitable and ineffective that all attempts at disease control are currently focused on cattle. This is a complex disease requiring complex solutions. Many of those solutions require hard decisions: that is, after all, the role of government.

The CLA believes:

- **that control of bTB in wildlife is vital if the disease is eventually to be eradicated**
- **that there should be recognition by Defra of the suffering and distress caused to wildlife affected by *M.bovis***
- **that control of *M.bovis* within the badger population must be the focus of any effort on wildlife, given the known extent to which badgers can excrete and spread disease**
- **that other species, such as deer, should be closely monitored for disease, that action should be taken to prevent spread of disease in farmed and park herds, and that further investigation should be made into possible route of transmission and likely risk of transmission from deer to cattle and other wildlife, but that such investigation should be secondary to the need to deal with existing disease levels in badger populations**

Identification of Disease

The control and eradication of disease can only be achieved if it is clear where that disease lies. Identifying the extent of bTB in wildlife is therefore an essential element of a control strategy.

We recommend:

- **the Road Traffic Accident (RTA) post mortem survey of badgers should be reinstated immediately in *all* areas of UK. This brings surveillance of badgers in line with cattle surveillance at slaughter**
- **All badgers culled, under the proposals below, should also be subject to post-mortem examination. Again, this brings badgers into line with cattle.**
- **The use of polymerase chain reaction (PCR) should be investigated and evaluated further as a means of establishing an improved *live* test for disease incidence**
- **Post mortem monitoring of other species, such as deer, should continue nationwide to monitor incidence and spread of disease in other species**

Prevention of Spread within Badger populations

Since the inception of the Krebs trials, lack of control of bTB among the badger population has coincided with an escalating incidence of disease. That these two factors are related is confirmed by the study work undertaken in Ireland.

Control of bTB in infected badger populations is therefore essential

The scale and extent of disease and the rate at which it is increasing, mean that urgent action is required.

We recommend:

A staged approach is necessary, so that the disease is, first, brought under control, and then eliminated. This requires the use of a combination of measures.

- i) **In hotspot areas, the evidence of the Irish study, which brought about up to 96% reduction in bTB, should be applied. This is similar to the clean ring strategy used in the 1980s, where culling took place and then setts were destroyed to prevent re-colonisation and re-infection.**
- ii) **Whilst a live test approach may be useful, particularly towards the outer extremities of hotspot areas, post mortem examination will also assist in establishing disease incidence.**
- iii) **Outside existing hotspot areas, the use of existing live tests (on a sett basis) – Brock or Eliza – or, subject to investigation, the use of PCR should be used to establish sett status prior to culling and destruction of the sett.**
- iv) **Where uninfected setts are identified by these live tests, vaccination should take place (subject to evaluation of vaccine efficacy when used in this way). Vaccine areas, setts and locations should be identified and recorded.**
- v) **Culling must be efficient and humane. The Irish study used snaring, whilst gassing has been used successfully in the past. Cage trapping is both expensive as well as inefficient and therefore unlikely to be suitable.**
- vi) **Within hotspot areas, once initial culling has reduced overall incidence of disease, the use of live test can be deployed to establish disease incidence prior to culling. This brings badgers into line with cattle, in that culls would take place only where disease was identified**

- vii) **A return to more widespread culling should not be ruled out if a targeted culling programme results in increased incidence of disease**
- viii) **Ultimately, hope must lie in the provision of a suitable vaccine, so that for cattle and wildlife the disease is controlled by prevention rather than culling**

INFORMATION

There is a great deal of information relating to bTB, a substantial proportion of which is not made easily accessible to stakeholders or the wider public. CLA believes that greater openness is required if a truly joint effort is to be made in tackling bTB.

We recommend:

- **information gathered must be made fully, publicly, available (e.g. badger RTA survey)**
- **research papers (including historical ones) should be published in full on the web**
- **links between Defra and stakeholders must be maintained post cessation of TB Forum, ideally in a similar forum**
- **Defra must ensure that any stakeholder groups are properly representative of the various organisations. In addition, there must be accountability. This cannot be achieved if groups are comprised of Defra invitees.**

RESEARCH

There is ongoing need for research to understand many aspects of the disease. However, we need to be sure that policy is not stalled whilst waiting the outcome of these researches. There is concern that Defra takes insufficient account of research from other countries, many of it highly relevant to the UK situation.

We recommend:

- **significant research is still required, including the efficacy of vaccination, the use of PCR, the spread of disease and methods of transmission, susceptibility to disease, impact of mineral uptake at reducing infection and the risks associated with transfer from wildlife other than badgers**
- **account must be taken of research ongoing in other countries**
- **research, or the need to research further areas, must not result in the stalling of action needed to control the disease now**

SUMMARY

We do not advocate a partial culling/vaccination of badgers approach within hotspot areas. Such a technique is untried, and the situation is now so urgent that reliable, well-documented action is needed. The perceived unpalatability of badger culling can be justified by government, if it has the commitment to truly deal with this disease, both in terms of animal health, as wildlife are currently untested and therefore suffer considerably the effects of bTB, and in terms of human health, the risks to which increase as the disease spreads.

In conclusion:

- **Cattle controls must apply nationally**
- **Badger and wildlife surveillance must apply nationally**

- Badger culling must be undertaken rigorously within hotspot areas (Irish Trial and Clean Ring strategy)
- Culling of infected setts should be undertaken nationwide
- Vaccination of healthy badgers should be investigated and instituted immediately if it is deemed viable
- Immediate action is imperative if this **disease** is to be effectively tackled and eliminated.
- Action must be sustained until the disease is eradicated

CLA has proposed a comprehensive set of measures, but we are clear that they cannot be picked and chosen. To implement further cattle control measures without also implementing wildlife controls will place further strain on the livestock industry whilst making no significant impact on the spread of the disease. We need to learn the lessons of the past few years – unless comprehensive action is taken across all vectors and routes of transmission, then bTB will escalate still further. Failure on the part of government to take this necessary action will be indicative of the government's lack of commitment to resolve this issue, and its need to appease certain interest groups, rather than deal with a potentially dangerous disease.

**Country Land and Business Association
September 2005**

¹ Defra

² Defra

³ Animal Health and Welfare Minister, Ben Bradshaw (statement 11 June 2004) "It is too early to say whether the 20% year on year increase in reactor cattle which was observed prior to FMD will continue in the longer term or not"

⁴ CVL'E' Wildlife Unit Badger Database

⁵ CSL (2004) The risk to cattle from wildlife species other than badgers in areas of high herd breakdown risk. DEFRA research Project SE3010

⁶ Parliamentary Question 158004 23 March 2004 "Suspect TB cases in cats reported to Defra; (Number of suspect cases confirmed by isolation of *M. bovis* from clinical or pathological specimens at Veterinary Laboratories Agency); 2003: 8 (2); 2002 9 (2); 2001 0 (0); 2000 2 (2)"

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