

# Bovine TB: where to now?

In this first instalment of a two-part article, the president of the British Cattle Veterinary Association, **Andy Biggs**, offers some personal views and experiences and comments on current policy and actions

**PERHAPS WHEN WE** try and look forward to see where we should or even could be going with bovine tuberculosis (bTB), we should look backwards to see where we have come from first. Rather than a complete history of bTB, I was going to restrict my backward glance to my own veterinary career of a mere 25 years.

It may seem pertinent, however, to reflect that our now long-retired senior partner remarked the other day that he spent his career bringing bTB down from the high levels around the time of TB attestation of cattle herds to the low we saw in the 1980s. It may seem ironic that it was around that time I qualified when bTB was at an all-time low with only approximately 80 herds under restriction as opposed to the 5,500 herd under restriction in 2005.

So unlike my retired senior partner who can say he helped bring bTB under control, in fact can nearly say he oversaw it to eradication status, I can only claim to have been the custodian of the cattle herds in my practice and overseen an inexorable and some would say exponential rise in bTB within those herds.

When I qualified, bTB was not really an issue in our practice to the point that an Inconclusive Reactor (IR), let alone a Reactor, was talked about as an unusual event. Now, in 2006, there is an inevitability about a herd going under restriction.

This was very poignantly illustrated by the outcome of the first pre-movement bTB test (PRMT) I performed in my practice on March 27, 2006, where the client who was obviously clear and free to trade had one of the 26 cattle I pre-movement tested go down as an IR.

As if this was not demoralising enough, as a consequence of having had a reactor in the herd within the last three years, the whole herd was put under restriction pending the outcome of the IR. If the IR goes clear the herd restriction will be lifted without any extra testing of the herd; if the IR becomes a reactor (either during one of its retests, or it becomes a reactor by remaining as an IR on three occasions) then the herd will go under permanent restriction and the usual herd testing will be required to achieve free status. This is generally one 60-day test if the reactor was NVL (non visible lesions) and culture negative or two tests at 60-day intervals if lesions were found or it was culture positive for *Mycobacterium bovis*. It all seems a bit like a game of snakes and ladders where there are more snakes than ladders and you need a double six to make any progress!

## Government approach

So what is the Government doing to help control bTB? If we continue to test and cull cattle, and virtually 30,000 cattle were killed in 2005 as a result of bTB testing, we now have decades of evidence to show that the disease prevalence will and is continuing to increase by 15 to 20% in terms of herd breakdowns year on year.

In the autumn of 2004, new measures were introduced:

- a recalculation of routine testing intervals to ensure TB testing complies with Commission rules;
- livestock movement restrictions to be imposed immediately a herd's routine test becomes overdue (zero tolerance);

- a more rigorous and systematic approach to identifying and dealing with potential new TB hotspots;
- the introduction of rigorous testing schedules for new and reformed herds.

None of these measures was going to offer any hope to farmers within the high incidence endemic areas. Now while we in Devon don't want to inflict the futility of trying to eradicate or even control bTB onto the clean areas of the country, these measures did little to instil confidence that the Government had a bTB policy that was going to help prevent the continuing problems in the endemic areas or even stop the spread of bTB around the country.

It is critical that we, and by that I mean those involved with the cattle industry, recognise we have moved bTB by moving cattle infected with bTB around the country – not rocket science I know, but we need to address this and that is what PRMT will go some way to doing.

Many vets (myself included) had "discussions" with MAFF and then DEFRA to try and avoid translocation of bTB (movement of bTB around the country by moving infected cattle) with restocking after FMD. It appeared that legislation for FMD restocking would not allow bTB control measures to be incorporated. This was a huge missed opportunity in disease control but has served as an experiment in itself. Many of the herds where bTB was imported by purchasing infected cattle had only one or two reactors and the intensive testing at 60-day intervals cleared these herds of infection. This tends to lend support to the theory that cattle to cattle spread is not sufficient to maintain bTB within a herd when imported in this way, providing aggressive testing and culling occurs soon after importation. In these circumstances, the amplification by cow to cow spread is insufficient to make the net reproductive factor  $R > 1.0$  and perpetuate disease within the herd. However, the big caveat on this is the time taken to identify herds where bTB has been imported by movement of infected cattle into the herd and the herd testing interval thereafter. Many areas of the country are on four-year testing and movement of infected cattle to herds within these areas will allow ample time and opportunity for infection to become established before the next herd test becomes due.

Clearly, the other risk of not tackling the disease aggressively enough in these herds with newly imported disease is that bTB gets out into the wildlife and an uncontrolled reservoir of infection is set up and then it seems from bitter experience in the endemic areas of the country that no amount of testing and culling will ensure herds remain free from bTB.

Then the Government, on December 15, 2005, announced three further measures:

- compensation – reduced to use a table valuation, deemed to be fairer by DEFRA, which was hoped to achieve more rapid removal of reactors off farms;
- pre-movement testing (PRMT) essentially for one- and two-yearly testing interval herds – initially to start on February 20 but put back to March 27, 2006; and
- a public consultation on the role of the badger (December 15,

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2005, to March 10, 2006), which aims to explain the issues and involve the wider public in the process to decide whether or not to cull badgers and the methods by which this could be done as part of the overall approach to control the spread of bTB in cattle in England.

It is too early to see what effects (positive or negative) that these new measures will have, but reducing compensation to a simple table of valuation to avoid what was shown by DEFRA research to be a minority of farmers being over-compensated and may now be resulting in undervaluation, particularly with pedigree cattle, is not going to help nurture a co-operative partnership approach. The PRMT has not been up and running long enough to pass comment on apart from the logistic problems arising so far, not least of which have resulted from a devolved approach to this issue (leading to different approaches and start times for England, Scotland and Wales). Farmers, not surprisingly, see the introduction of the first two measures without guarantee of the third as an unfair imposition, particularly those in endemic areas who view these as unlikely to help their cause and those who have taken steps to avoid cattle movement risks feel even more aggrieved at the futility of continued testing and slaughtering of cattle with no hope of any improvement.

One also has to ask the question, why ask the public about culling badgers, because many will answer "no", irrespective of the science. This is clearly seen in other situations where culling is suggested as a method of wildlife management. The impression is that when asked similar questions, wildlife group leaders give a similar response. The public, I feel, think culling is total extermination across the country. Work done on behalf of DEFRA showed that where members of the public were better informed on the complexities of bTB and the part played by badgers acting as a wildlife reservoir, they were more likely to agree that culling of infected badgers was in certain circumstances acceptable. On the specifics of a consultation on badger culling, however, the public will not, as a rule, have access to scientific data from around the world to hand or have the ability to interpret the data available, so why ask them? Nor is the automated one mouse click to send a "do not kill badgers" from a web page to DEFRA a

scientific way of gauging public concern. We must control bTB as a disease and not keep pointing fingers at cattle or badgers.

## Why is bTB getting worse?

So the \$64,000 question is, why is bTB out of control? If we knew that it would certainly make policy-making a lot easier. If there is one thing we do know about bTB, it is that it is a very complex disease. There are many factors involved, some of which will include: too long a testing interval (even we got on to three-yearly testing in my practice, which clearly had huge potential for leaving undisclosed infection on our clients' farms); a significant infected wildlife reservoir (the badger); no natural predator/population control of the major wildlife reservoir; larger herd size; unrestricted cattle movements; and a test with better specificity than sensitivity.

When prevalence, or for that matter incidence, was lower, the relatively poor sensitivity was of less importance. The need to be accurate in specificity was such that if a cow was to be slaughtered as a reactor it was good to know the test was 99% plus accurate. Remember, we are testing for infection or actual evidence of infection (i.e. an immune response), not for disease. So it should not surprise us that many reactor cattle are NVL especially in endemic areas where much short interval (SI – i.e. every 60 days) testing occurs when cattle are more likely to be found in the early stages of infection. This does not mean they are false positives as NVLs are sometimes referred to even by some vets. If very detailed post-mortems were performed, many of these NVL cattle would have visible if not microscopic lesions. However, even those which have mounted an immune response and are not infected cannot be left behind because infected immune cattle are indistinguishable from immune uninfected cattle by the current skin test.

There is also the issue that these tuberculin skin test positive cattle can no longer be left in the herd as sentinels to give a warning of infection within a herd as they are already skin test positive. So even if they were uninfected, they could not be left in the herd. Does this ring any bells with vaccination arguments with FMD and more recently avian influenza (AI)?

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## – part two

The BCVA president, **Andy Biggs**, continues with his personal views on the current situation and outlines his association's policy on the way forward

**So if we** have a test with good specificity, what about the sensitivity? All tests have varying sensitivity (and for that matter specificity) depending on the disease prevalence and incidence.

In the case of the bTB tuberculin skin test, the sensitivity, which is generally quoted as between 77 and 95%, is likely to be lower in high incidence endemic areas as there will be more cattle in the early latent period, which is generally taken to be 30 to 50 days after infection before they become reactive to the skin test.

The endemic areas are likely to have a higher new infection rate and these new infections could arise from some local amplification of infection within an infected herd (i.e. cow to cow transmission) or from infection pressure from infected wildlife reservoirs such as the badger.

It is also possible that these latent infections which by definition will be missed by the skin test will be moved from herd to herd either locally or more commonly over greater distances by translocating undetected infection. Clearly, as PRMT is designed to reduce translocation of disease, not spread between cows, we need to be fully aware of the limitations of only testing cattle pre-movement. The tuberculin skin test is effectively a herd test for detecting sentinel animals to indicate the presence of bTB within a herd and as such has limitations when performed on small groups as in PRMT.

In endemic areas, where the chance of cattle being in the early latent phase is higher is combined with the small group size in PRMT, the sensitivity will be compromised further still. So with these complications in bTB detection, we should not be surprised when cattle are found either at slaughter or at a subsequent herd bTB skin test relatively soon after a clear PRMT test. This is bound to happen and we need to inform our clients that it will and make sure they do not put too much faith in the security of a PRMT – and all this with a test they are doing at their own expense.

The best practice would be to isolate the cattle on the farm of destination and perform a post-movement bTB skin test 60 days after the PRMT before they were allowed to mix with the rest of the cattle on the farm. The pre- and post-movement approach is being taken by Scotland; however, when you have something to protect, i.e. very little bTB, the cost benefit of the extra red tape, cost and hassle of managing and monitoring (policing) post movement testing is clear. There are, however, practicality issues of isolating particularly dairy cattle when they need to go through a common milking parlour.

Government policy, current or future as known to date, offers nothing for farmers in bTB endemic areas, particularly those where cattle movements are not an issue and there is no other explanation as to how bTB entered the herd.

### **How do we help the conscientious farmer who is doing all he can?**

So what about the closed herd and I mean the truly closed herd? Closed herds with bTB breakdowns are not uncommon. There are also many herds where the only bovine purchased is a bull every four or five years. Surely if that bull does not become a reactor, these herds are also effectively closed as well.

Much is made of nose to nose contact but in Devon where banks and hedges are commonplace, this is not always as common as some would make out. We have a client who milks 65 Friesian cows and his last bovine purchase was a cow 12 years ago. His purchase? A Hereford suckler cow to breed a bull to serve his dairy heifers.

This client is very forward thinking. He also has a naïve status for BVD. I mention that not because of the possible immunosuppressive link to bTB but to show how good his biosecurity is. Remember, it is reckoned that 90% of herds and 70% of cattle have antibody to BVD. He has no cattle neighbours and is surrounded by woodland (a high risk for bTB from the TB99 data analysis). We have tested his bulk milk every three months for the last 10 years and he has remained naïve so I think we can rule out disease spread by cow to cow transmission over the fence even if he had cattle neighbours.

Badgers are very common in this part of Devon and as far as I know bTB does not fall from the sky, so what does society offer a farmer who has not only taken all the measures he should but a few more besides?

Government policy, current or future as known to date, offers nothing for farmers in bTB endemic areas, particularly those where cattle movements are not an issue and there is no other explanation as to how bTB entered the herd. The implementation of PRMT has offered them nothing except to pay for attempting to keep the rest of the country free from bTB – a very worthy and necessary thing to do but perhaps not high on the list of a farmer who has been under restriction for many years.

Incidentally, when we were asked if we would cope with the likely workload for PRMT, we looked at our client base and could immediately rule out a significant number of clients who were under restriction and had no option to move cattle except direct to slaughter.

# TB and badgers

## How do we go forward?

What we really need is a regional approach. There has always been a national bTB policy and this has had the potential to be too weak on cattle controls in new emerging areas where use of G-IFN (gamma interferon) and skin test (using severe interpretation) may remove more cattle than strictly necessary but would be justified as it will mean the disease is stamped out in cattle quickly before it has a chance to establish in wildlife species.

Data to support this are on the DEFRA website which states: "Similarly in 46% of the 1,288 herd breakdowns that occurred in Great Britain in 1997 and 1998, a single reactor was detected at the disclosing test, and a further 12% involved two reactors (R. Clifton-Hadley, personal communication). Since reactors may have been infected at any time since the previous test, these figures would indicate that many reactor cattle present a low risk of infection to in-contact animals."

In endemic areas there is less if any justification for the use of the more cattle aggressive approach of a combination of G-IFN and skin test to remove cattle if the wildlife source is not addressed. Conversely, any action against badgers in clear or new emergent areas is not justified and control should be concentrated on cattle as above. The approach to badger control in endemic areas is discussed later in this article.

The general aim must be the eradication of tuberculosis caused by *Mycobacterium bovis* although this will be effectively the inter-community-trade-type definition of eradication, i.e. not total elimination of the pathogen but bringing the disease under significant control to such a level that only sporadic disease occurs. It is significant that within the EU, 23 of the 25 member states have eradicated bTB to this extent with only the UK and Ireland being the exceptions. The common link is that both have significant bTB infected badger populations. So the aim must be to have healthy cattle and healthy badger populations.

Where science is lacking, sound veterinary principles of disease control should be applied as was the case with BSE control where the control measures preceded the scientific facts. The science relating to bTB eradication from around the world shows different approaches but where wildlife reservoirs have existed, wildlife control has been an integral part of the bTB control plan.

In an ideal world, the approach would be to live trap badgers and use a real-time badger side test, using the test results to cull infected badgers and vaccinate and release uninfected badgers. There are, however, huge logistical and practical problems with this approach...

The following quote from DEFRA's own Regulatory Impact Assessment sets the scene well in terms of what is needed in these problem areas: "In the high incidence areas, where the majority of costs of pre-movement testing and compensation will fall, there is a reservoir of infection in the badger population. Without tackling this exogenous infection reservoir, cattle-based measures alone may not be sufficient to have a significant impact on the incidence of disease."

The Minister, Ben Bradshaw, has also said: "Experience from around the world shows that strict cattle controls are essential if TB is to be contained and eradicated. But it also shows that it is unlikely to be successful unless in addition action is taken to deal with the disease in wildlife."

## The badger is involved: what science do we have?

Translocation and transmission of bTB occurs in badgers just as it does in cattle and wildlife groups must recognise this and accept their responsibilities. The fact that culling badgers had an effect on disclosure rates in cattle herds is conclusive evidence that the badger is involved, particularly as these effects were seen within the relatively short period of the RBCT. The constant references by badger groups that cattle factors alone explain the intractability of the disease are not helpful. Citing intensification, housed cattle, etc., does not pan out when we see extensive hill cattle, organic farms and the infamous small-

holder self-professed "good-lifer" Kremer case. This is clearly a very complex disease to control and we need to apply similar principles of control as those applied to cattle, so we must aim at least for healthy populations of badgers.

The aim should, therefore, be bTB eradication from the badger population to the inter-community-trade-level definition such that only sporadic disease is present. Culling of infected badgers (and deer) must be an integral part of bTB control in just the same way it is with the culling of infected cattle.

In an ideal world, the approach would be to live trap badgers and use a real-time badger side test, using the test results to cull infected badgers and vaccinate and release uninfected badgers. There are, however, huge logistical and practical problems with this approach; for example, it is calculated that it costs £800 per badger trapped in the RBCT trials and we don't have data to show we have an effective and environmentally safe vaccine.

Talking of the RBCT, the data so far have shown that culling of badgers resulted in a decrease in herd bTB breakdowns within the proactive areas with an increase in herd bTB breakdowns in the areas immediately surrounding the areas – "edge effects", "perturbation effects".

Both the decrease and increase were considered statistically significant findings. However, there were some non-statistical trends where after repeated culling the percentage improvement in herd bTB breakdowns improved further and the adverse edge effects decreased. It is unlikely that sufficient data will be produced to allow further analysis to prove the true significance or otherwise of these on-going trends but we could be looking at a short-term pain for a long-term gain.

Cost-benefit analysis has stated that, "Culling badgers in the RBCTs had no beneficial effect to the overall bTB herd breakdown rate of cattle", but this has been reported as, "Culling of badgers has no beneficial effect on bTB incidence". These are very different statements.

The Krebs Trials tested one culling strategy of trapping with a closed season with periods of no culling for welfare reasons. There was questionable efficiency of badger removal which was somewhere between 20 and 60% (DEFRA, 2005) in areas of poorly-defined geographical and physical boundaries and it may be that other methods

could have yielded different results.

What the true badger numbers' reduction was will never be known; however, John Bourne is quoted as saying there was a "significant reduction in badger activity". At what level of removal is a trial a culling trial and when is it a population control study with dispersal and disruption effects?

Interestingly, a fact-finding visit to the EU Commission in Brussels raised some interesting points for some of us to take home. Unsurprisingly, there was a lot of concern regarding the high levels of bTB in the UK; there was also surprise we were not using PRMT, some concern regarding the three tests of IRs when the EU directive states two and a suggestion that badger population control was needed.

Back to the RBCT. There are a lot of questions raised by this work. What are the effects of leaving behind 40 to 80% of infected badgers? What are edge effects due to? How do the edge effects compare with local bTB incidence? Why was this effect apparently not seen in trials in other parts of this country and the world? Is this linked to the generally higher culling rates in other trials?

Others involved in the RBCT culling work have some very valid criticisms which cast serious doubts over the methodology and data and may give some reason at least as to why the findings are not seen in other trials (see BTB33). These would include the observation that limited trapping, eight days per year with Krebs, has little effect if carried out late in the year and some areas went almost two years without an effective cull. There were grave concerns that costs for future culling strategies must not be based on the very expensive and inefficient methods used which resulted in an opinion that the first four years of culling, i.e. intended badger removal, were farcical.

Data from the RBCT can clearly be confusing as the following shows. "A survival analysis of reactive cull data which looked at individual farms in the reactive areas only, survival time to a herd's next breakdown was calculated for farms where (a) no badger cull took place (mostly because the trial was halted before the cull could be implemented), (b) badgers were culled but were bTB culture negative, and (c) badgers were culled and at least one was culture positive. There was significantly increased survival time in herds associated with culled badgers that were culture negative, and significantly increased survival time (though

to a lesser degree) in herds associated with culled badgers, some of which were culture positive, when compared to herds where no badger culling had taken place." – Sayers, R., Clifton-Hadley, R. *et al.* (2005) Survival analysis of the time between breakdowns in the reactive areas of the RBCT in relation to badger capture, CERA, VLA. Draft for publication.

### What should we do in areas where badgers are driving reinfection of cattle?

Even in these areas we must not ignore cattle measures and although PRMT is essential in preventing the export of bTB to clean areas, it will help reduce dissemination by cattle movements within endemic areas to an extent. However, much of the "creeping" spread seen in endemic areas is not cattle-movement related. Keeping badgers and cattle apart may be possible while cattle are housed but is just not a practical option while at grass. We commonly see herds get infected while at grass, clear up while housed only to be turned out in the spring to become reinfected.

If we want to separate badgers from cattle at grass, what will we do? Have red fields for cattle, blue fields for badgers and yellow ones for rambles? If rambles have a right to roam, I am sure badgers do! Simple things like common water supplies which, when they are natural supplies like streams, are impossible to control but even troughs are no better.

Work by Garnett *et al.* (2003) studied the ability of wild badgers to climb into cattle feed troughs set at different heights. At least

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12 wild badgers climbed into a cattle feed trough set at heights above 80cm (the recommended height in biosecurity guidelines for farmers). The maximum height climbed was 115cm, which is beyond the reach of calves and yearlings. They concluded that there is no trough height which is usable that completely excludes badgers.

We know that close-cropped stock-grazed grass is attractive to badgers as it is usually rich in easier access earthworms. However, ecological control by reducing the biomass of earthworms seems again that society has got it wrong. Earthworms are good for soil conditioning so to spray land to reduce earthworm biomass as an indirect way of reducing badger populations seems to me to be getting things the wrong way round. [Letters: *Veterinary Record* **158** (13): 455].

In fact, DEFRA has awarded £3 million to research the effects of different farming techniques on earthworm biomass. The need to increase earthworm biomass is seen to be critical to good soil management, as any organic farmer will tell you. The research shows that soil with earthworm tunnels can act as a reservoir and stop run-off, river pollution and erosion seen in heavy downpours.

### Alternative approach needed

Having ruled out live trapping with badger side testing resulting in culling or release with vaccination on the grounds of impracticality, cost and lack of suitable vaccine, we need to have an alternative approach to deciding where to instigate controlled badger culling.

The following is adapted from the BCVA response to the DEFRA badger culling consultation document.

Targeted culling over specific areas linked to herd bTB incidence where cattle movements cannot explain the repeated herd breakdowns by shooting and snaring of badgers may be the most viable short-term option for control. However, it is acknowledged that there are not only significant practical and welfare issues with these methods of control which need to be addressed but there is also a risk of inefficient culling increasing the chance of disturbance to the remaining infected badger population.

Culling should only occur in high incidence areas where there is sufficient evidence to show that there is a high level of infection in the badger population. It is in these areas where cattle controls alone have not and will not work.

# TB and badgers

In the longer term, culling badgers by gassing should be further investigated as it could potentially be the most efficient, cost-effective, and possibly most humane method to employ once issues surrounding its application have been resolved. Targeting of wildlife disease surveillance and recording of culling activity would enable the effectiveness of control methods to be properly evaluated.

There is a need to continue research into the application of control methods, including culling and vaccination strategies. The development and application of an effective vaccine for badgers would afford some protection from infection whilst providing for an exit strategy from any culling policy used to reduce the existing infection in the badger population.

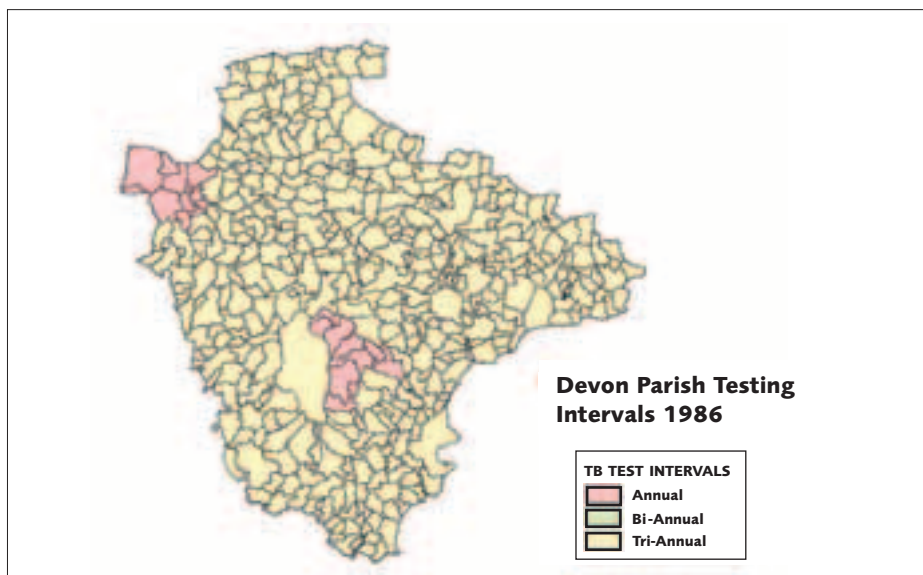
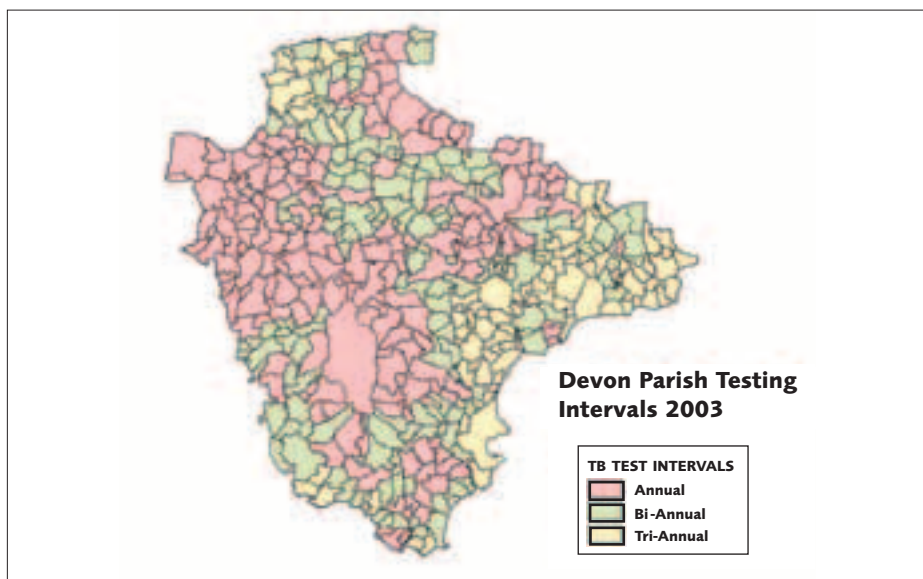
In light of the obvious lack of successful bTB control in endemic areas (in part at least from previous ineffectual control policies) there is a need for a fair, clear, transparent and obvious partnership between DEFRA and farmers to implement the more stringent cattle and badger controls that are needed. Leaving farmers to take on the task of badger culling alone would not be in the spirit of a partnership. DEFRA clearly has the experience, personnel and ability to co-ordinate activities on a wide scale and the BCVA feels it is only with such a co-ordinated approach that the efficiency will reach levels that would minimise or avoid the concerns seen in the RCBT cull voiced by the ISG.

The following is a quote from Ben Bradshaw regarding the badger culling consultation. "I hope that we don't hear just the same old arguments; I think that we do have new and interesting evidence ... that I hope will inform a more mature and more rational debate than the one that we sometimes have."

## Maintain objectivity

We clearly do need to maintain objectivity, as entrenched positions with diametrically opposed factions of industry saying, "It's your fault not mine", just leads to further prevarication and inaction.

So if nothing else, the RBCT tells us badgers are clearly involved in the disease as culling badgers affected bTB disclosure rates in cattle herds. World experience shows you will not achieve bTB eradication in cattle without addressing the infected wildlife reservoir where one exists. More efficient culling techniques are needed in areas identified as being driven by badger infection and it will need to be an iterative approach.



Methods currently being discussed by DEFRA and its wildlife unit are gassing, snaring and shooting. Much research is on-going in terms of welfare, efficacy and design of equipment. What is clear is that in terms of the ever increasing bTB prevalence and incidence, if we want something different to happen we need to do something different and we need to do it now.

No country has achieved effective control/eradication of bTB without addressing any associated wildlife reservoirs should they exist. Spending money on research, development of suitable vaccination, etc., is clearly important but it is surely better to spend now than to haemorrhage cost over years. If the "science" isn't there, apply the "art" and first principles of medicine until it is.

## Acknowledgements

Thanks go to Carl Padgett, secretary of the BCVA, who helped with the production of the articles on the bTB section of the BCVA web page and kindly read through this article.

Useful links which will take you to some of the references in this article:

- [www.bcva.org.uk/](http://www.bcva.org.uk/)
  - [www.defra.gov.uk/animalh/tb/pdf/wilemore141105.pdf](http://www.defra.gov.uk/animalh/tb/pdf/wilemore141105.pdf)
  - [www.defra.gov.uk/animalh/tb/isg/report/pathogen.htm](http://www.defra.gov.uk/animalh/tb/isg/report/pathogen.htm)
  - DEFRA (2005) p23, par 37: [www.defra.gov.uk/corporate/consult/badgers-tbcontrols/consultation.pdf](http://www.defra.gov.uk/corporate/consult/badgers-tbcontrols/consultation.pdf).
- BTB33: [www.publications.parliament.uk/pa/cm200506/cmselect/cmenvfru/905/905iiw32.htm](http://www.publications.parliament.uk/pa/cm200506/cmselect/cmenvfru/905/905iiw32.htm). [www.banksag.co.uk/F4F/news/index.jhtml;jsessionid=KTFW245PEA5VNNWJH4WCFEQ?article\\_id=fwi94187](http://www.banksag.co.uk/F4F/news/index.jhtml;jsessionid=KTFW245PEA5VNNWJH4WCFEQ?article_id=fwi94187).