



Cynulliad National  
Cenedlaethol Assembly for  
Cymru Wales

## Environment, Planning and Countryside Committee



Inquiry into Bovine Tuberculosis

August 2004



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## Foreword



Bovine tuberculosis is a serious disease in Wales, with incidents of bovine TB increasing almost threefold since 1996. As well as the animal welfare issues and the economic impact and stress placed on farming families by this increase, it is also placing a financial strain on the Assembly's resources, with compensation paid for the compulsory slaughter of infected cattle in Wales increasing eightfold between 1998 and 2002.

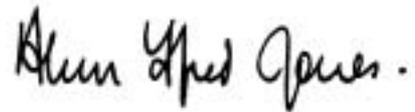
As a Committee, we decided to investigate how the Assembly could contribute to the containment and reduction of bovine TB through its existing powers, animal health and welfare best practice, management controls and the testing regime.

The Committee called upon the expertise of scientists, farmers, veterinary officers, wildlife groups and officials from the Welsh Assembly Government in undertaking the inquiry. The input of these individuals and the groups they represent helped the Committee to appreciate the complexities of the problem and the difficulties in formulating an appropriate strategy to tackling the issue of bovine TB in Wales.

Having considered all the evidence, this report recommends a pragmatic, holistic approach to tackling bovine TB by introducing immediate Wales-specific measures and establishing an 'Intensive Treatment Area' within a TB hotspot in Wales. Creating a Wales TB Action Group, which would deliver short-term measures to tackle TB in cattle and investigate longer-term measures, is also recommended. In our view, longer-term scientific solutions should be taken forward at UK level.



I look forward to receiving the Government's response to our recommendations. Our thanks go to all those who presented evidence to this inquiry. My thanks also, as ever, to the Members' Research and Committee Services for their support and guidance.



**ALUN FFRED JONES AM**

Chair, Environment, Planning and Countryside Committee

August 2004



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# Summary of recommendations

## Wales' approach to TB control

*Recommendation 1: That the Welsh Assembly Government takes immediate action to tackle Bovine TB in Wales, as outlined in para. 3.8 of this report. Wales' approach to tackling TB should be holistic and pragmatic involving all aspects associated with the spread of the disease. Measures should be developed in partnership with all stakeholder groups and based on current scientific knowledge.*

“ 3.8 The Welsh Assembly Government could take immediate action in the following areas:

- Implementation of pre-movement testing across Wales, with cattle sale dependent on a valid pre-movement testing certificate.
- Increase the frequency of cattle testing in clean parishes from every four years to every two years.
- Introduce the use of the gamma interferon test for all herd breakdowns to ensure diseased cattle are identified and removed as soon as possible.
- Ensure that TB99 forms are completed for all herd breakdowns.
- Ensure that the recommendations of the Independent Husbandry Panel are implemented on farms.
- Collect and test wildlife killed in Road Traffic Accidents (RTAs) outside hotspot areas.
- Introduce a dedicated TB helpline or TB information packs to ensure help is available for farmers to deal with the stress associated with TB breakdowns and provide advice and guidance on TB control measures.”



*Recommendation 2: That the Welsh Assembly Government establishes an 'Intensive Treatment Area' within a hotspot area in Wales that has experienced prolonged problems with TB, incorporating the points set out in para. 3.12 of this report. This should be funded by the Welsh Assembly Government.*

" 3.12 An Intensive Treatment Area could involve:

- Investigating all cattle movements on and off farm associated with a new herd breakdown using and improving the Cattle Movement Tracking System.
- Gamma interferon testing to ensure diseased cattle are identified and removed as soon as possible.
- Testing of cattle on all farms in close proximity, e.g. within a 2km radius of a breakdown.
- If investigations find that the cause of the breakdown is not due to cattle to cattle transfer, an investigation of major species of wildlife known to carry TB should be undertaken within a 2km radius of the breakdown. Wildlife that carry and transmit TB found to show signs of the disease should be removed. A level of prevalence/rate of transmission in wildlife should be agreed upon.
- Potentially infected areas should be cleaned as well as practically possible to reduce the risk of transmission of TB to other wildlife.
- On farm bio-security should be improved with the assistance of veterinary officers, Divisional Veterinary Managers, and others.
- The progress of breakdowns on farms should be closely monitored.
- Regular reports on the progress of the Intensive Treatment Area should be made to the TB Action Group (see below) and the Welsh Assembly Government."



*Recommendation 3: That the Welsh Assembly Government incrementally rolls-out intensive treatment to other areas of Wales if, following evaluation, it proves useful in controlling TB. Sharing of costs of funding between the farming industry and the Welsh Assembly Government should be considered.*

*Recommendation 4: That the Welsh Assembly Government establishes a Wales TB Action Group to deliver short-term measures to tackle TB in cattle and to investigate longer-term measures, as outlined in para. 3.16 of this report. Membership of the Action Group should be small and made up of those able to implement decisions, but representative of stakeholders. The Wales TB Action Group should be accountable to the Minister, but with a specific remit for action. Regular reports should be made to the Minister and publicised to all stakeholders.*

“3.16 The remit of the Wales TB Action Group could include:

- Investigating the establishment of laboratory, testing and research facilities in Wales (e.g. to undertake gamma interferon tests, which must take place within 24 hours of samples being taken).
- Considering support for farmers, such as an increased role for veterinary officers in advising on biosecurity risks.
- Consulting on introducing an industry-levy to pay for TB testing and compensation.
- Investigating other longer-term issues, such as the cattle valuation process.”

## GB-wide issues

*Recommendation 5: That longer term and larger scale investigations, such as vaccine development and trials, continue to be undertaken at UK level.*





# Introduction

## Rationale for control of Bovine Tuberculosis

1.1 The Government intervenes in the control of bovine tuberculosis (TB) for the following reasons:

- *To protect human health* - Historically, policies to control bovine TB were primarily introduced to protect public health, as bovine TB can also cause TB in people. Controls include compulsory testing of cattle and slaughter of infected animals; inspecting carcasses in slaughterhouses and the pasteurisation of milk for human consumption. The current risk to human health is considered negligible.<sup>1</sup>
- *To safeguard the interests of the wider economy and society* - Bovine TB has economic implications for affected farms in terms of lost income, increased costs and cash flow. The measures in place to control the disease place an economic burden on farmers when there is an outbreak, but leaving the disease unchecked would produce significant costs for farmers, including lower productivity from infected animals.
- *To secure opportunities for trade* - In the case of bovine TB the economic consequences of outbreaks of the disease have led to international controls under the auspices of the Office International des Epizooties (OIE) and the EU. These controls regulate trade in live animals in order to protect countries that are free from the disease and provide standards under which countries that are not free from the disease are permitted to trade safely.
- *To protect and promote animal welfare* - TB is a chronic and debilitating disease in cattle, causing weakness, emaciation, problems to the lymph nodes, coughing and the formation of lesions (tubercles). The responsibility for protecting the welfare of farmed livestock rests with the owner or keeper of the animal.

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1 Bovine tuberculosis in cattle and badgers: report to the Rt Hon Dr Jack Cunningham MP by the Independent Scientific Review Group (Chairman Professor John R Krebs), 1997, MAFF.

## The scale of Bovine TB in Wales

1.2 Table 1 below shows the number of cattle herds having confirmed new TB incidents in Wales since 1996. It can be seen that the number of incidents is concentrated in the south and south west areas and have increased almost threefold since 1996. It should be noted that the Foot and Mouth Disease (FMD) outbreak in 2001 meant TB testing was significantly reduced and this should be taken into account in comparing data before and after 2001.

**Table 1 Number of herds with confirmed new TB incidents 1996 - 2003**

County	1996	1997	1998	1999	2000	2001	2002	2003
Clwyd	0	0	0	1	0	1	4	0
Dyfed	32	22	49	60	68	77	154	166
Gwent	60	27	24	36	48	18	54	63
Gwynedd	2	0	1	1	0		1	1
Mid Glam	1	2	1	1	1		1	0
Powys	12	2	6	13	26	27	73	83
S Glam	0	0	1	0	0		0	0
W Glam	3	2	4	15	7	4	5	8
Total	110	55	86	127	150	127	292	321

Source: New confirmed tuberculosis incidents by county 1997 – 2001 (GB), Defra Great Britain Statistics for 1 January – 31 December 2002, Defra Great Britain Statistics for 1 January – 31 December 2003, Defra

1.3 The increase in the number of TB incidents has led to an increase in the amount of compensation paid to farmers for the compulsory slaughter of infected cattle.

1.4 A 2003 report by the National Audit Office Wales found that National Assembly for Wales expenditure on compensation increased eightfold between 1998 and 2002 to £8 million. The report also found that compensation payments made in 2002 were at least 50 per cent higher than the market prices of the animals slaughtered.<sup>2</sup>

2 Compensating Farmers for Bovine Tuberculosis in Wales, National Audit Office, July 2003, Auditor General for Wales website, [http://www.agw.wales.gov.uk/publications/2003/agw2003\\_8.pdf](http://www.agw.wales.gov.uk/publications/2003/agw2003_8.pdf)



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- review the long-term management and reduction of *M.bovis* through animal health and welfare best practice and control processes, acknowledging available scientific evidence.

**1.9** In doing so, the Committee examined the science of *M.bovis*, farm animal health and welfare, bio-security and animal husbandry, and management controls for *M.bovis*, including the testing regime.

**1.10** This report summarises the evidence presented to the inquiry and outlines the conclusions and recommendations made by the Committee.

**1.11 Section 2** of this report sets out the legislative framework for the control of bovine TB, summarises existing GB and Wales TB strategies, and outlines current scientific developments.

**1.12 Section 3** summarises the issues raised about the methods for the containment, long-term management and reduction of bovine TB within existing powers.

**1.13** The Committee recommends a pragmatic, holistic approach to tackling bovine TB by introducing immediate Wales-specific measures and establishing an 'Intensive Treatment Area' within a TB hotspot in Wales.

**1.14** The Committee also recommends the establishment of a Wales TB Action Group to deliver short-term measures to tackle TB in cattle and to investigate longer-term measures. Longer-term scientific solutions should be taken forward at UK level.

## 2 Background

### Nature of Bovine Tuberculosis

**2.1** Bovine TB is caused by a bacterium, *Mycobacterium bovis* (*M. bovis*). Cattle are considered to be the natural host of bovine TB, but it has also been found in many other domestic and wild animals worldwide<sup>8</sup>.

### Bovine TB and human health

**2.2** *M. bovis* can cause TB in man and during the 1930s, when over 40 per cent of the UK dairy herd was infected with TB, it posed a risk to human health, with over 50,000 people a year becoming infected with bovine TB.

**2.3** The introduction of public health measures such as pasteurisation and the inspection of cattle carcasses at slaughter have greatly reduced the risk *M. bovis* poses to human health. The majority of TB cases in people are now caused by *Mycobacterium tuberculosis* (*M. tuberculosis*). The symptoms of *M. bovis* and *M. tuberculosis* infection are the same. They can only be distinguished by laboratory tests.

**2.4** Pasteurisation kills the *M. bovis* bacteria. Most milk in England and Wales is pasteurised, although untreated milk can still be sold, it must carry a health warning about the risks of drinking raw milk. All milk in Scotland must be treated prior to sale<sup>9</sup>.

**2.5** The Meat Hygiene Service (MHS) inspects all meat to ensure it is fit for human consumption. Cattle are inspected for signs of TB before and after slaughter.

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8 For example buffaloes, goats, sheep, horses, camels, pigs, deer, cats, dogs, foxes, mink, badgers, ferrets, rats, primates, llamas, tapirs, elephants, rhinos, possums, otters, seals, hares, moles, racoons, coyotes, lions, tigers, leopards, lynx. Manual of standards for diagnostic tests and vaccines, 4th edition (2000), Office International des Epizooties (OIE) [www.oie.int/eng/normes/mmanual/A\\_00050.htm](http://www.oie.int/eng/normes/mmanual/A_00050.htm)

9 TB in cattle Factsheet 2 - Protecting human health, Defra, Defra TB webpages, <http://www.defra.gov.uk/animalh/tb/publications/pdf/factsheet2.pdf>



**2.6** All tuberculosis in humans is notifiable under the *Public Health (Control of Disease) Act 1984* to the local authority (normally to the Consultant in Communicable Disease Control). *M. bovis* is also reportable to the Health and Safety Executive (HSE) under the *Reporting of Disease and Dangerous Occurrence Regulations 1995* (RIDDOR) if it may have been acquired occupationally through working with animals or their products that might have been the source of infection<sup>10</sup>.

## Legislative framework for TB control

**2.7** *EU Directive 64/432/EEC on animal health problems affecting intra-Community trade in bovine animals and swine*<sup>11</sup> sets out the criteria for testing cattle for bovine TB. In England and Wales this Directive is enacted by several Tuberculosis Orders made under the *Animal Health Act 1981*.

**2.8** Powers to control bovine TB under the *Animal Health Act 1981* and the *Tuberculosis (England and Wales) Order 1984* have been fully devolved to the National Assembly for Wales by the *National Assembly for Wales (Transfer of Functions) Order 1999*. Powers include those relating to notification, compulsory testing, slaughter of infected animals, valuation, compensation and herd movement restrictions.

**2.9** These powers are implemented on the ground by the Defra State Veterinary Service (SVS), who undertake TB tests, along with private Local Veterinary Inspectors (LVIs). Any laboratory tests are undertaken by the Veterinary Laboratories Agency (VLA), an executive agency of Defra.

**2.10** Compensation for a slaughtered animal is paid to farmers under the *Brucellosis and Tuberculosis (England and Wales) Compensation Order 1978*, as amended, and is currently set at market value.

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10 Health and safety implications of TB reactor cattle for slaughterhouse operators, <http://www.defra.gov.uk/animalh/tb/human/p1safety.htm>

11 Under the terms of EU Directive 64/432/EEC, trade in live cattle and their products can only take place where those cattle either come from an 'Officially TB Free' (OTF) country or herd. The UK has never had OTF status and intracommunity trade depends on individual OTF herd status. [http://europa.eu.int/smartapi/cgi/sga\\_doc?smartapi!celexapi!prod!CELEXnumdoc&lg=EN&numdoc=31964L0432&model=guichett](http://europa.eu.int/smartapi/cgi/sga_doc?smartapi!celexapi!prod!CELEXnumdoc&lg=EN&numdoc=31964L0432&model=guichett)



## GB TB control strategy

**2.11** Great Britain's TB control currently consists of the following five strands:

- I. Protect public health – through the use of pasteurisation and meat inspections.
- II. Develop a vaccine – for use in either cattle or wildlife (see below).
- III. Research how TB is transmitted – by investigating why cattle do/don't contract TB, how it spreads between cattle and how wildlife are involved in the spread of TB.
- IV. Detect and prevent cattle to cattle spread – by testing cattle for the disease and using movement restrictions.
- V. The badger culling trial – to find out if culling badgers helps reduce TB in cattle (see below).

**2.12** The Welsh Assembly Government in partnership with Defra and the other devolved administrations is currently consulting on a new GB TB strategy<sup>12</sup>. Each of the devolved administrations will take forward steps in their own areas.

## TB control in Wales

**2.13** An 'Interim Programme' of additional measures to control TB was announced by the Assembly Government on 29 May 2002. The programme was drawn up in co-operation with Defra and SVS Wales. It relied upon Defra funding for key elements, which included:

- *Enhanced testing programme* - £3 million of additional resources were secured by Defra to tackle the backlog of tests which built up as a result of the Foot and Mouth Disease outbreak across GB. This prioritised herds at greatest risk, i.e. herds with tests overdue by 6 and 12 months, and herds contiguous to new confirmed breakdowns. By the end of August 2003, this increased activity had reduced the backlog of tests to 457 (from 5,100 in November 2001) in Wales.

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12 Preparing for a GB strategy on bovine tuberculosis, 2004, Welsh Assembly Government.

- *Pilot gamma interferon test* - Wales is leading this pilot in GB. The hypothesis being tested in this trial is that the gamma interferon (IFN- $\gamma$ ) test, used in tandem with the skin test, can improve the detection rate of infected cattle and thus shorten the period such herds remain under restrictions.
- *Severe Interpretation* - The skin test is a biological test that gives a quantitative reaction, that is, the size of the subsequent lump on the skin is measured. Where disease is confirmed, 'severe' interpretation is employed immediately thus lowering the level at which inconclusive reactors are classified as infected and removed from the herd.

## Cattle testing

**2.14** All cattle herds, except beef fattening units, are routinely tested for TB every one, two, three or four years, depending on how many cases of TB there have been in the area<sup>13</sup>. All eligible cattle in a herd are tested<sup>14</sup>. For the herd to be considered TB free and to maintain its Official Tuberculosis Free (OTF) status, all cattle must test negative.

## Skin test

**2.15** Cattle are tested using the comparative intradermal skin test (the skin test). This involves injecting a small amount of tuberculin<sup>15</sup> from *M. bovis* and *M. avium*<sup>16</sup> into the skin of the cattle. The immune system of infected cattle reacts to the tuberculin and causes a swelling where the injection has been made. The difference in the size of swelling between the two injection sites is examined 72 hours later.

**2.16** If any animal gives a positive reaction (termed a "reactor"), the entire herd loses its OTF status and movement restrictions are imposed. No cattle are allowed in or out of the herd unless sent direct to a slaughterhouse, under licence and conditions specified by animal health departments. Reactors are isolated, valued and slaughtered. The slaughtered animals undergo post mortem and samples are taken for laboratory analysis to confirm or reject the presence of TB. A confirmed TB incident is known as a "breakdown".

<sup>13</sup> Herds that produce milk for sale raw (unpasteurised) are all subject to annual testing.

<sup>14</sup> Cattle less than six weeks old are not tested.

<sup>15</sup> A sterile extract from the *Mycobacterium* bacterium.

<sup>16</sup> *Mycobacterium avium* – the bacterium that causes avian (bird) TB.



**2.17** Cattle that give an inconclusive reaction (“inconclusive reactors” or “IRs”) are isolated from the herd and are re-tested at a later date.

**2.18** The farmer receives compensation of 100 per cent of the market value for slaughtered reactors. Milk from TB-positive herds can still be sold, but must be pasteurised.

**2.19** Once TB has been confirmed in a herd, movement restrictions remain in place until the whole herd passes the skin test on two consecutive occasions. This can take many months.

**2.20** There are a number of problems associated with using the skin test as a means of diagnosing TB in cattle. It is difficult to standardise, other infections/diseases may interfere with the reaction to the skin test, it results in false negative results<sup>17</sup> and a 60-day wait is required between tests, so movement restrictions can be in place for a long time.

### Gamma interferon test (IFN- $\gamma$ )

**2.21** The gamma interferon test (IFN- $\gamma$ ) has been developed as a possible alternative to the skin test. The test is carried out in a laboratory on blood taken from cattle in the field and is based on detecting an immune response to *M. bovis* infection.

**2.22** The test has a low specificity (about 70 per cent), which means that for every ten cows identified by the IFN- $\gamma$  test as having TB, only seven would actually be infected and three would be incorrectly identified as being infected. The IFN- $\gamma$  test does, however, seem able to identify TB at an earlier stage of infection, so may help clear up breakdowns more quickly. The test is not officially recognised by the EU as a diagnostic test for bovine TB but is recognised by the OIE as a useful adjunct to the skin test. The test is being piloted in Wales as part of the interim programme of TB control measures introduced in 2002 (see 2.13 above).

### Bovine TB and Wildlife

**2.23** The potential threat any animal capable of contracting bovine TB poses to cattle health will depend on a number of factors – prevalence of

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<sup>17</sup> Ten per cent of cases are false negatives, i.e. one in ten infected animals goes undetected by the skin test.



the disease in the population, whether the disease can be passed on, behavioural characteristics, etc.

**2.24** In Britain and Ireland, the badger is considered by many to play an important role in the maintenance and spread of TB in cattle by acting as a reservoir for the disease. The Krebs Report<sup>18</sup> concluded that:

“...The sum of evidence strongly supports the view that in Britain badgers are a significant source of infection in cattle. Most of this evidence is indirect, consisting of correlations rather than demonstrations of cause and effect ... it is not, however, possible to state quantitatively what contribution badgers make to cattle infection...”<sup>19</sup>

**2.25** The route of transmission of TB between badgers and cattle is unknown but the most likely route is via contact between cattle and urine, faeces or sputum from infected badgers<sup>20</sup>. Studies of cattle and badger behaviour show that they usually avoid each other<sup>21</sup>. Badgers have been observed coming onto and foraging for food in farmyards, entering farm buildings, eating stored feed and hunting for invertebrates and rodents, often coming into close contact with housed cattle. They have been observed climbing or jumping into food and water troughs and following badger visits, droppings and urine have been found contaminating cattle feeding areas<sup>22</sup>. This was highlighted to the Committee in Dr. Chris Cheeseman's evidence<sup>23</sup>.

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18 In 1996, Professor John Krebs led a scientific review on behalf of the Government into the possible link between bovine TB in badgers and cattle. The report was published in 1997 and has become known as “The Krebs Report” - Bovine tuberculosis in cattle and badgers: report to the Rt Hon Dr Jack Cunningham MP by the Independent Scientific Review Group (Chairman Professor John R Krebs), 1997, MAFF.

19 Bovine tuberculosis in cattle and badgers: report to the Rt Hon Dr Jack Cunningham MP by the Independent Scientific Review Group (Chairman Professor John R Krebs), 1997, MAFF.

20 Spatial perturbation caused by a badger (*Meles meles*) culling operation: implications for the function of territoriality and the control of bovine tuberculosis (*Mycobacterium bovis*) (2000), Tuytens, F.A.M., Delahay, R.J., Macdonald, D.W., Cheeseman, C.L., Long, B. & Donnelly, C.A., *Journal of Animal Ecology*, 69, 815 – 828.

21 Behaviour of Irish badgers in relation to bovine tuberculosis, Sleeman, D.P. & Mulcahy, M.F. in *The Badger*, (1993), ed Hayden, T.J., Royal Irish Academy, Dublin.

22 Use of cattle farm resources by badgers (*Meles meles*) and risk of bovine tuberculosis (*Mycobacterium bovis*) transmission to cattle, (2002), Garnett, B.T., Delahay, R.J. & Roper, T.J., *Proc. R. Soc. Lond. B*, 269, 1487 – 1491.

23 Environment, Planning and Countryside Committee meeting 5 May 2004. The transcript of Dr Cheeseman's evidence and the presentation he gave are available on the committee pages of the National Assembly website at <http://www.wales.gov.uk/keypubassemcommittees/index.htm>



**2.26** Removing or culling badgers in an area has been used in an attempt to control TB in cattle in the UK and Ireland. The removal of badgers from some areas was followed by a decrease in the prevalence of TB in cattle in following years<sup>24</sup>. Removing badgers from an area may, however, have knock-on effects on the remaining badgers in the area. This is referred to as perturbation and the degree to which it affects the TB status of badgers and/or cattle is not fully understood.

**2.27** TB has also been confirmed in five of the six species of deer found in Britain. There is no compulsory TB testing of farmed or park deer, although a number of deer farmers undertake voluntary testing of their herds as part of the Deer Health Scheme operated by the British Deer Farmers Association (BDFA)<sup>25</sup>. It is possible that wild/feral deer may infect farmed or park deer and that from there it could spread to cattle or to other wildlife vectors such as badgers, but the role of deer, if any in the spread or maintenance of TB is unknown.

**2.28** Few studies have been carried out on the potential role of British animals other than badgers and deer as sources for cattle infection.

## The Randomised Badger Culling Trial (RBCT)/Krebs trial

**2.29** One of the recommendations of the Krebs Report<sup>26</sup> was:

“...a randomised badger culling trial to test the effectiveness of different strategies and to provide unambiguous evidence of the role of badgers in cattle TB, the trial to be overseen by an expert group...”

**2.30** The Government set up the Independent Scientific Group on Cattle TB (ISG) in 1998 to oversee the trial and other research. The trial has become known as the “Randomised Badger Culling Trial” (RCBT) or the “Krebs Trial”. It is comparing three different culling options in 30 circular treatment areas each approximately 100km<sup>2</sup>:

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24 The East Offaly badger research project: an interim report, Eves.J. in *The Badger*, (1993), ed Hayden, T.J., Royal Irish Academy, Dublin.

25 British Deer Farmers Association (BDFA), <http://www.deer.org.uk>

26 Bovine tuberculosis in cattle and badgers: report to the Rt Hon Dr Jack Cunningham MP by the Independent Scientific Review Group (Chairman Professor John R Krebs), 1997, MAFF.

- Proactive culling - all badgers within the treatment area are culled. The aim is to remove as many badgers in the area as possible and prevent re-colonisation by further culling on a regular basis.
- Reactive culling - only badgers in areas that experience a TB breakdown are culled. The aim is to remove as many badgers as possible that may be associated with a breakdown.
- No culling - a control area with surveying only of badger numbers and activity.

**2.31** The treatment areas are grouped into triplets, with one proactive, one reactive and one survey only area comprising a triplet. Triplets are located in the south and south west of England<sup>27</sup>. There are no trial areas in Wales. The trial was delayed by the outbreak of Foot and Mouth Disease and results are not expected before 2006.

**2.32** On 4 November 2003, UK Animal Health Minister Ben Bradshaw announced the suspension of the reactive element of the Krebs Trial<sup>28</sup>. An interim analysis of the data indicated that reactive culling of badgers in TB breakdown areas led to an average 27 per cent increase in TB breakdowns compared with survey-only areas, where no culling has taken place<sup>29</sup>. Some farmers have seen the halting of the reactive element of the trial as confirmation of a link between badgers and the spread of TB to cattle.

**2.33** In addition to the Krebs Trial, a questionnaire<sup>30</sup> survey to investigate the factors that may be associated with an increased risk of TB breakdown is underway. The survey collects data from farms that have suffered a TB breakdown on potential risk factors in the 12-month period leading up to a breakdown, such as farm location, herd movements and health, husbandry, water sources, bedding, feeding practices, etc. In addition, data is collected from similar farms that have not suffered a breakdown to provide a comparison.

27 Triplet locations: A = Gloucester / Hereford, B = Devon / Cornwall, C = East Cornwall, D = East Hereford, E = North Wiltshire, F = West Cornwall, G = Staffs / Derbyshire, H = Devon / Somerset, I = Gloucestershire, J = Devon.

28 Minister announces the suspension of badger culling in reactive areas of the Randomised Badger Culling Trial, News Release 4 November 2003, Defra website, <http://www.defra.gov.uk/news/2003/031104b.htm>

29 Q & A brief on 4 November 2003 Ministerial announcement on the change to the randomised badger culling trial, Defra TB webpages, [http://www.defra.gov.uk/animalh/tb/culling/p5prog\\_qa.htm](http://www.defra.gov.uk/animalh/tb/culling/p5prog_qa.htm)

30 The TB 99 questionnaire.

## Republic of Ireland – the Four Areas Project

**2.34** A similar trial to the Krebs Trial has been undertaken in the Republic of Ireland – the Four Areas Project (FAP). The trial is complete, but no results have yet been published, although leaked interim results suggest that a 90 per cent cull of badgers leads to an 80 – 90 per cent reduction in TB incidents in cattle.

**2.35** The trial has been criticised by some animal welfare groups for the use of snares, which they claim, are contrary to the conditions of the Bern Convention<sup>31</sup>. It has also been criticised for the lack of a control area, making comparing culling and no culling difficult.

## Development of a TB Vaccine

**2.36** The development of a vaccine is seen by many as the best long-term means of controlling TB in Great Britain:

“In the long run, the best prospect for control of bovine TB is to develop a vaccine for cattle...a badger vaccine should also be kept as an option...”<sup>32</sup>

**2.37** A vaccine has, however, been “ten years away” for a considerable time<sup>33</sup> and development success cannot be guaranteed.

**2.38** Vaccines stimulate the immune system to produce antibodies against specific diseases and reduce the number of hosts susceptible to the disease. If the number of available hosts is reduced sufficiently, the pathogen causing the disease can be forced to die out.

**2.39** There are two broad options for the development of a vaccine for use in combating TB; either a cattle vaccine or a wildlife vaccine (primarily developed for use in badgers). Both options have technical, environmental and legal challenges associated with their development.

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31 The grim fate of the Irish badger, (2001), An Broc No 23 Spring 2001 The Badgerwatch (Ireland) newsletter, IrishAnimals.com website, [www.irishanimals.com/action/badger.html](http://www.irishanimals.com/action/badger.html)

32 A report by the Independent Scientific Review Group on TB in cattle and badgers, chaired by Professor John Krebs, executive summary (1997).

33 Badgers and bovine TB, Seventh Report of Session 2002-03, (2003), House of Commons Environment, Food and Rural Affairs Committee, HC 432, <http://www.publications.parliament.uk/pa/cm200203/cmselect/cmenvfru/831/831.pdf>



**2.40** The BCG vaccine is made from *M. bovis*. It is named after the two French doctors that developed it – Dr. Calmette and Dr. Guerin. The vaccine’s full name is Bacille Calmette Guerin (BCG). It is used to control TB in humans and in the UK is generally given to children between the ages of 10 and 14.

**2.41** The BCG vaccine is a starting point for much of Defra’s research into a vaccine against bovine TB<sup>34</sup>. Its use in cattle and badgers has been tested, but it gives a highly variable level of protection from infection and does not provide immunity.

**2.42** All other countries with a cattle TB problem have rejected the option of vaccinating cattle due to the poor efficacy of existing vaccines and the trade limitations imposed on vaccinated cattle. Logistically, vaccinating cattle is easier than vaccinating badgers or other wildlife. Difficulties arise, however, in developing a vaccine that offers sufficient protection against TB and does not interfere or give false positive readings in routine tests for TB in herds.

**2.43** A vaccine for badgers does not need to provide complete immunity; it only needs to reduce the risk of transmitting TB to cattle. BCG may be a suitable vaccine for use with badgers. Trials are currently ongoing in the Republic of Ireland on housed wild badgers with the possibility that field trials may begin in the next few years<sup>35</sup>.

## Bovine TB in other countries

**2.44** Bovine TB is a worldwide animal disease. The Office International des Epizooties (OIE) keeps a record of the disease status around the world on its HANDISTATUS database on the internet<sup>36</sup>.

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34 Vaccine – BCG, Defra TB webpages,  
<http://www.defra.gov.uk/animalh/tb/vaccine/p2bcg.htm>

35 Tony Edwards, Chief Veterinary Officer for Wales, Environment, Planning and Countryside Committee Meeting 4 February 2004.

36 Office International des Epizooties (OIE) information  
<http://www.oie.int/hs2/report.asp?lang=en>



**2.45** The success of TB control programmes in other countries depends on a number of factors. Test and slaughter policies similar to that in Britain are in use around the world and can be used to successfully eliminate bovine TB if no reservoir of TB exists in wild animals. The success of control programmes in the presence of a wildlife reservoir depends on the ability to control the disease in the reservoir<sup>37</sup>.

#### **2.46** *New Zealand*

- Bovine TB is thought to have been introduced in the 19th Century, when cattle were introduced. A national TB eradication programme was in place by the 1970s.
- The farming and related industries are heavily involved in TB control policy. Funding is partly via a levy on cattle at the point of slaughter and partly from the Government.
- The eradication programme incorporates a number of elements including test and slaughter of cattle, zoning of regions according to their TB status, pre-movement testing of cattle, and culling of brushtailed possum – the wildlife reservoir.

#### **2.47** *Republic of Ireland*

- Eradication programme introduced in the 1950s. Ireland is subject to the same EU TB control legislation as the UK, although some national legislation goes beyond the requirements of the EU legislation<sup>38</sup>.
- A reservoir of TB in badgers is considered the major constraint to eliminating the disease.

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37 Zoonotic Tuberculosis due to *Mycobacterium bovis* in Developing Countries, O. Cosivi, J.M. Grange, C.J. Daborn, M.C. Raviglione, T. Fujikura, D. Cousins, R.A. Robinson, H.F.A.K. Huchzermeyer, I. de Kantor, and F.-X. Meslin, *Emerging Infections Diseases*, Vol 4 No.1, Centers for Disease Control and Prevention, <http://www.cdc.gov/ncidod/eid/vol4no1/cosivi.htm>

38 Final report of a mission carried out in Ireland from 28 April to 2 May 2003 in order to evaluate the bovine tuberculosis eradication programme, (2003), European Commission Health & Consumer Protection Directorate General, DG(SANCO)/9086/2003 – MR final, European Commission website, [http://www.europa.eu.int/comm/food/fs/inspections/vi/reports/ireland/vi\\_rep\\_irel\\_9086-2003\\_en.pdf](http://www.europa.eu.int/comm/food/fs/inspections/vi/reports/ireland/vi_rep_irel_9086-2003_en.pdf)

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- The eradication programme includes annual testing of cattle; follow-up testing, including use of the gamma interferon test (IFN- $\gamma$ ); TB status information on cattle passports.
  - Farmers are responsible for paying for the first herd tests in each year and also fund the eradication programme via levy. Farmers are financially penalised if they breach disease regime regulations.

#### 2.48 *Michigan, USA*

- A bovine TB eradication programme has been in place in the USA since the early 1990s, mainly through the use of carcass inspection. All states except Texas and Michigan are TB free in livestock.
- In Michigan, cattle are tested annually using the skin test and surveillance testing of wildlife carcasses is used to monitor and control TB.
- Zoning and pre-movement testing is also used.
- Wild deer act as a reservoir for TB and restrictions have been imposed on tourists feeding deer. Hunters contribute to disease surveillance by providing carcasses of deer and other animals to test for signs of TB<sup>39</sup>.

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39 Michigan TB update, (1999), SCWDS Briefs, 14.4, Southeastern Co-operative Wildlife Disease Study website, <http://www.uga.edu/scwds/briefs/0199brief.pdf>



## 3 Discussion and recommendations

### Information presented to the inquiry

**3.1** The Committee heard evidence from the Minister for Environment, Planning and Countryside and his officials, farmers, their representatives, wildlife groups, veterinary officers and scientists in formal committee meetings in February, March and May 2004.

**3.2** In addition, Committee members visited a farm affected by TB in west Wales, followed by an informal discussion with local Carmarthenshire and Pembrokeshire farmers.

**3.3** Written contributions were also received from a wide range of organisations.

**3.4** A full list of contributors to the inquiry can be found at **Annex 1**. **Annex 2** summarises the issues raised during the inquiry, possible action and solutions, and their relative pros and cons.

### Developing TB control options

**3.5** There are a number of complex issues connected with the development of control options for bovine TB, associated with the scientific understanding of the disease, its spread, the role of wildlife and the development of testing and control tools. In addition to these issues are the views of the farming community, wildlife groups and the general public, which are sometimes contrary to each other. Some of these issues are outlined below:

- The spread of bovine TB in and between cattle and wildlife is not clearly understood. Much research has been completed and continues to be undertaken. Much of this is long-term in nature with no practical solution apparent in the short-term.
- Current tests for bovine TB in cattle are not completely reliable. Tests for TB in badgers and other wildlife are less reliable. The skin test is the only internationally recognised test. The gamma interferon test produces more false positives.

- Badgers are widely believed to play a role in the transmission of bovine TB, but this has not been definitively proven and the extent of the badger's role is unknown. This leads many farmers to support some form of badger control, particularly in areas where TB is a continuing problem. Badger conservation groups oppose this.
- The role and extent that cattle-to-cattle transmission plays in the maintenance and spread of TB is unknown. More rigorous biosecurity and cattle husbandry measures may reduce the spread of TB. An independent review of cattle husbandry measures was set up by Defra, which proposed several precautionary husbandry practices that may reduce the risk of cattle contracting TB. Recommendations included preventing wildlife access to farm buildings and food stores, fencing off badger setts to prevent cattle gaining access to them, limiting stocking densities in buildings and other general biosecurity measures.<sup>40</sup> Farmers may be unwilling to implement increased biosecurity measures without financial assistance, or if they negatively impact on business.
- A cattle and/or badger vaccine has been in development for many years. A vaccine suitable for widespread use remains at least 10 years away.

**3.6** Having considered the evidence, the Committee reached the following conclusions and recommendations.

### Wales' approach to TB control

**3.7** Immediate action should be taken. Wales' approach to tackling TB should be holistic and pragmatic involving all aspects associated with the spread of the disease. Measures should be developed in partnership with all stakeholder groups and based on current scientific knowledge.

**3.8** The Welsh Assembly Government could take immediate action in the following areas:

- Implementation of pre-movement testing across Wales, with cattle sale dependent on a valid pre-movement testing certificate.

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<sup>40</sup> The role of cattle husbandry in the development of a sustainable policy to control *M. bovis* infection in cattle, (2001), Phillips, C.J.C., Foster, C., Morris, P. & Teverson, R., MAFF, Defra website, <http://www.defra.gov.uk/animalh/tb/publications/pdf/hpanel.pdf>

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- Increase the frequency of cattle testing in clean parishes from every four years to every two years.
  - Introduce the use of the gamma interferon test for all herd breakdowns to ensure diseased cattle are identified and removed as soon as possible.
  - Ensure that TB99 forms are completed for all herd breakdowns.
  - Ensure that the recommendations of the Independent Husbandry Panel are implemented on farms (see para. 3.5).
  - Collect and test wildlife killed in Road Traffic Accidents (RTAs) outside hotspot areas.
  - Introduce a dedicated TB helpline or TB information packs to ensure help is available for farmers to deal with the stress associated with TB breakdowns and provide advice and guidance on TB controls measures.

**Recommendation 1: That the Welsh Assembly Government takes immediate action to tackle Bovine TB in Wales, as outlined in para. 3.8 of this report. Wales' approach to tackling TB should be holistic and pragmatic involving all aspects associated with the spread of the disease. Measures should be developed in partnership with all stakeholder groups and based on current scientific knowledge.**

**3.9** In addition, the use of an 'Intensive Treatment Area' should be considered an integral part of the development of Wales' TB control. This should be established in a hotspot area that has experienced prolonged problems with TB.

**3.10** Following an evaluation of the Intensive Treatment Area's effectiveness, a similar approach to the control of TB could be rolled-out across the whole country incrementally.

**3.11** The Welsh Assembly Government should initially fund the Intensive Treatment Area, with a view to sharing costs with industry if and when rolled-out across Wales.



### 3.12 An Intensive Treatment Area could involve:

- Investigating all cattle movements on and off farm associated with a new herd breakdown using and improving the Cattle Movement Tracking System.
- Gamma interferon testing to ensure diseased cattle are identified and removed as soon as possible.
- Testing of cattle on all farms in close proximity, e.g. within a 2km radius of a breakdown.
- If investigations find that the cause of the breakdown is not due to cattle to cattle transfer, an investigation of major species of wildlife known to carry TB should be undertaken within a 2km radius of the breakdown. Wildlife that carry and transmit TB found to show signs of the disease should be removed. A level of prevalence/rate of transmission in wildlife should be agreed upon.
- Potentially infected areas should be cleaned as well as practically possible to reduce the risk of transmission of TB to other wildlife.
- On farm bio-security should be improved with the assistance of veterinary officers, Divisional Veterinary Managers, and others.
- The progress of breakdowns on farms should be closely monitored.
- Regular reports on the progress of the Intensive Treatment Area should be made to the TB Action Group (see below) and the Welsh Assembly Government.

**Recommendation 2: That the Welsh Assembly Government establishes an 'Intensive Treatment Area' within a hotspot area in Wales that has experienced prolonged problems with TB, incorporating the points set out in para. 3.12 of this report. This should be funded by the Welsh Assembly Government.**



**Recommendation 3: That the Welsh Assembly Government incrementally rolls-out intensive treatment to other areas of Wales if, following evaluation, it proves useful in controlling TB. Sharing of costs of funding between the farming industry and the Welsh Assembly Government should be considered.**

**3.13** The delivery of the short- and medium-term measures outlined above, along with practical investigation of longer-term measures should be undertaken by a Wales TB Action Group.

**3.14** Membership of the Wales TB Action Group should be small and made up of those able to implement decisions, but representative of stakeholders.

**3.15** The Wales TB Action Group should be accountable to the Minister, but with a specific remit for action. Regular reports would be made to the Minister and publicised to stakeholders.

**3.16** The remit of the Wales TB Action Group could include:

- Investigating the establishment of laboratory, testing and research facilities in Wales (e.g. to undertake gamma interferon tests, which must take place within 24 hours of samples being taken).
- Considering support for farmers, such as an increased role for veterinary officers in advising on biosecurity risks.
- Consulting on introducing an industry-levy to pay for TB testing and compensation.
- Investigating other longer-term issues, such as the cattle valuation process.

**Recommendation 4: That the Welsh Assembly Government establishes a Wales TB Action Group to deliver short-term measures to tackle TB in cattle and to investigate longer-term measures, as outlined in para. 3.16 of this report. Membership of the Action Group should be small and made up of those able to implement decisions, but representative of stakeholders. The Wales TB Action Group should be accountable to the Minister, but with a specific remit for action. Regular reports should be made to the Minister and publicised to all stakeholders.**



## GB-wide issues

**3.17** Much longer-term and resource intensive investigations and solutions to the control of bovine TB should continue to be taken forward at UK level. Such issues would include large-scale research into the transmission of TB, similar to the Krebs trial and Four Areas Project; cattle and wildlife vaccine development; and other research and development.

**Recommendation 5:** That longer term and larger scale investigations, such as vaccine development and trials, continue to be undertaken at UK level.



# Annex 1

## Information presented to the inquiry

### Written submissions<sup>41</sup>

The following organisations and individuals submitted written submissions to the inquiry.

- Badger Watch and Rescue Dyfed
- Biodynamic Agriculture (BDAA)
- British Cattle Veterinary Association (BCVA)
- British Veterinary Association
- Country Land Association
- Countryside Council for Wales (CCW)
- Farmers Union of Wales (FUW)
- Mr Jeremy Fonge
- Dr Helen Fullerton
- Food Standards Agency (FSA)
- Jane Hutt AM, Assembly Minister for Health and Social Care
- Andre Kleinjans
- Mr Wyn Lewis
- National Federation of Badger Groups (NFBG)
- NFU Cymru - Wales
- Radnorshire Badger Group (RBG)
- Royal College of Veterinary Surgeons
- RSPCA
- Edward Solomon
- Trace Element Services Limited (TES) (Mr R Goodwin-Jones)
- Wales Deer Initiative
- Wales Young Farmers Clubs (YFC)
- West Wales Animal Aid

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41 Copies of submissions received electronically and other documents listed below can be accessed from the committee pages of the National Assembly website at <http://www.wales.gov.uk/keypubassemcommittees/index.htm>



## Farm visit<sup>42</sup>

The Committee visited Mr JM and Mr LMJ Wheeler Clyngwyn Farm, Clynderwen on 12 February 2004. The visit was followed by an informal discussion with local farmers at the Nant y Ffin Motel, Llandissillio.

## Oral evidence

The following individuals gave oral evidence to the inquiry.

### 4 February 2004<sup>43</sup>

- Minister for Environment, Planning and Countryside
- Tony Edwards, Chief Veterinary Officer for Wales
- Alick Simmons, Head of Veterinary Endemic Diseases and Zoonoses Division, Animal Health and Welfare Directorate General, Defra

### 3 March 2004<sup>44</sup>

- Paddy Rooney, Country Land and Business Association
- Dr Ruth Watkins, Country Land and Business Association
- Dr Liz Howe, Countryside Council for Wales
- John Lloyd Jones, Chair, Countryside Council for Wales
- Dr Malcolm Smith, Countryside Council for Wales
- Evan R Thomas, Farmers' Union of Wales
- Brian Walters, Vice President, Farmers' Union of Wales
- Dai Davies, Deputy President, National Farmers Union – Cymru
- Mary James, Head of Policy, National Farmers Union – Cymru
- Dr Elaine King, National Federation of Badger Groups
- Pete Smith, Young Farmers Clubs

### 5 May 2004<sup>45</sup>

- Dr Chris Cheeseman, Head of UK Government's Wildlife Ecology Unit

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42 See note of points raised.

43 See papers EPC(2)-02-04 (p1a-c) and EPC(2)-02-04(mins)

44 See transcript of evidence

45 See transcript of evidence and Dr Cheeseman's PowerPoint presentation

## Summary of issues raised during the inquiry

Comments/issues raised	Possible action/solutions	Pros	Cons
<b>Science of M. bovis</b> Krebs trial			
1. The trial should be seen through to the end.	Wait until full results of the trial are available before making a decision on whether badger populations should be controlled.	Badger control policy could be based on scientific evidence. Supported by badger groups and scientists.	Results not likely for several years. Unpopular with farmers - many feel that waiting for results without doing anything is not an option.
2. Delays to the trial have stopped new TB control policies being developed.	Develop control policies based on current knowledge.	Could reduce the spread of TB. Supported by farmers. A "Plan B" TB control policy was called for by the House of Commons Agriculture Committee in 2000/2001 and supported by the EFRA Committee Report into Badgers and Bovine TB in 2002/2003.	May be counterproductive – could increase the spread of TB.
3. Halting the reactive trial has led to some questioning the usefulness of the whole trial. It has been suggested that Ministers halted the trial prematurely.	Ensure that the reasons behind the halting of the reactive trial are properly explained to all in easily understood terms. Make the data on which the decision was made and the reasoning behind the decision publicly available.	Will increase transparency and trust in the decision-making process. May bolster support and understanding of the remaining parts of the Krebs trial.	Welsh Assembly Government not able to act on this without Westminster. May lead to some groups trying to undermine the trial, data and/or results.

Comments/issues raised	Possible action/solutions	Pros	Cons
Irish Four Areas Project (FAP)			
4. No peer-reviewed results have been published.	Find out when results will be published. As soon as results/data become available, make them widely available.	Reduces uncertainty and speculation about leaked results. Increase knowledge of effects of badger culling on TB. Low cost.	Not possible to speed up publication of results.
5. Leaked/preliminary results seem to show that culling badgers has an impact on reducing TB in cattle.	Make statement on leaked findings – state Welsh Assembly Government position e.g. to wait until full results are available (see above).	Gives clear indication of Welsh Assembly Government opinion – aids in transparency and trust building.	May be seen as an empty gesture/stalling tactic.
6. The snaring method used is inhumane and could not/should not be used in Wales/UK.	Continue to use cages in any badger capture operations e.g. for control, research purposes.	More acceptable capture method to wildlife groups and general public. Would not contravene Bern Convention.	Does not catch a sufficiently high proportion of the badger population.
Gamma interferon trial (IFN- $\gamma$ )			
7. The test is a useful addition to the skin test. A 60-day period between tests is not needed.	Introduce the test in hot spots.	Test seems to identify TB at an earlier stage than the skin test – may clear up breakdowns faster, leading to movement restrictions being lifted faster than with skin test alone – popular with farmers.	More false positives than skin test - uninfected cattle are culled – unpopular with farmers. Detection of more infected cattle will lead to short-term increase in compensation payments. Must be undertaken in a laboratory. No facilities in Wales – increased cost to provide and operate.

Comments/issues raised	Possible action/solutions	Pros	Cons
8. The trial will not answer questions about the usefulness of the test.	Undertake trials/research that will help to answer important questions regarding the specificity and sensitivity of the test. Trial some of the newer versions of the test now available.	Answer some of the questions the Independent Steering Group and others consider need to be answered. May be supported by farmers, Countryside Council for Wales and badger groups alike.	Lack of laboratory facilities to undertake tests. Increased cost. Time consuming – may be seen as another delay to changing current policy. May not be supported by Defra – may undermine current trial.
Vaccine development			
9. A useable vaccine (cattle or badger) is a priority but is still a long way off.	Wait for a vaccine to be developed.	Farmers are supportive of the use of a cattle vaccine.	Unclear how long it will take to develop a vaccine – farmers are not willing to wait without interim measures in place. Vaccine use has potential trade implications. Any vaccine would have to undergo small and large-scale field trials. The skin test would not distinguish between a vaccinated and an infected cow.
	Undertake vaccine development in Wales.	Farmers are supportive of the use of a cattle vaccine.	Increased cost. Lack of specialised research facilities. Risk of duplicating work being undertaken by/on behalf of Defra. Vaccine use has potential trade implications. Any vaccine would have to undergo small and large-scale field trials. The skin test would not distinguish between a vaccinated and an infected cow.

Comments/issues raised	Possible action/solutions	Pros	Cons
10. A wildlife vaccine will only be useful if wildlife is the main source of infection.	Carry out research and development into a wildlife vaccine.	Wildlife vaccine is less complicated to develop than a cattle vaccine – it doesn't have to protect against TB, only reduce the spread to cattle. Increase scientific knowledge of TB in badgers and vaccine use.	Increased cost. Lack of specialised research facilities. Risk of duplicating work being undertaken by/on behalf of Defra. Use of a wildlife vaccine has practical and ethical problems. Any vaccine would have to undergo small and large-scale field trials. Some badger groups opposed to the use of a badger vaccine.
Breeding increased resistance			
11. Natural resistance to TB has not been demonstrated in cattle.	Carry out research into natural cattle immunity.	Increase knowledge about natural immunity and epidemiology of TB.	Defra and partners are starting to look into this. Wales-based research may duplicate this. A long-term option. Increased cost. Lack of facilities.
12. Farming methods/breeding undermines natural resistance.	Encourage less intensive farming methods.	Relatively low cost to Government. Increase the view that Welsh produce is clean, "green" and healthy – could benefit sales. Could be linked to food chain assurance schemes or agri-environment schemes.	Unproven link between farming method/intensity and TB. May be economically damaging to farms/farming communities.

Comments/issues raised	Possible action/solutions	Pros	Cons
13. There is evidence that some badgers may be naturally immune.	Investigate the possibility of natural immunity in badgers and its potential uses in developing TB control methods.	Increase knowledge about natural immunity and epidemiology of TB in badgers.	Increased cost. Long term - practical use of any natural immunity eg vaccine, would be many years away. Lack of facilities.
Public health			
14. Pasteurisation of milk effectively safeguards human health.	Make pasteurisation compulsory - Food Standards Agency Advisory Committee for Wales has advised banning sale of unpasteurised milk.	Increase public health protection.	Consultations in England and Wales have not supported compulsory pasteurisation.
15. Increased access to the countryside may increase public health risk.	Investigate potential spread of TB to humans through contact with wildlife.	Increase knowledge of TB in wildlife. Increase public health protection.	Increased cost. Long term. May damage tourist/recreation industry if the public is not fully informed/educated.
16. TB breakdowns pose a health risk to farmers in terms of stress, anguish, etc.	Ensure that help is available and well publicised eg Rural Stress Helpline. Uptake and usefulness of help and advice should be periodically assessed to ensure it is effective.	Relatively low cost - uses already existing services.	Does not tackle the cause of the problem.

Comments/issues raised	Possible action/solutions	Pros	Cons
<b>Animal health, welfare, biosecurity &amp; husbandry</b>			
<b>Role of farmers</b>			
17. Farmers play a crucial role in controlling TB. Farm biosecurity is the individual farmer's responsibility.	Set minimum biosecurity standards to control TB on farms. Encourage improved biosecurity and husbandry e.g. grants. Use farm-specific health plans. Penalise farmers for not implementing minimum biosecurity standards e.g. cross-compliance. Introduce licensing and minimum training standards for animal keepers.	Could get all farms to a specific minimum biosecurity/husbandry level. Improved biosecurity may reduce spread of TB. Could get all farmers/employees to a specific minimum training and education standard.	Lack of firm evidence supporting a link between improved biosecurity, husbandry and lower TB incidence. Farmers wary of guidelines/controls with no scientific evidence or cost-benefit analysis. Farmers unlikely to support cross-compliance.
18. A lack of trace elements in cattle diet increases risk of TB.	Investigate the importance of trace elements in diet to cattle immunity and susceptibility to TB.	Recommended by the House of Commons EFRA Committee 2002/2003.	Unproven link. Independent Husbandry Panel concluded that trace element deficiencies are unlikely to be related to TB infection. Increased cost. Long-term. TB99 questionnaire includes information on minerals in cattle diets – research may duplicate this effort.

Comments/issues raised	Possible action/solutions	Pros	Cons
<p>Role of vets</p> <p>19. Vets play a key role that should be developed/increased.</p>	<p>Increase the role of vets to include advising farmers on biosecurity and minimising risks. Vets to provide advice/guidance on drawing up farm health plans and checking/helping with implementation.</p>	<p>Makes more use of existing resources/visits to farms.</p>	<p>May over-stretch veterinary resources. Question over who would pay for the advice/guidance role – farmers or government?</p>
<p>20. Vets have important local knowledge of farms and conditions and can pass information to and from farmers.</p>	<p>Formalise the liaison role of vets between farmers and Defra officials.</p>	<p>Makes more use of existing resources/visits to farms. Clarifies the role of vets in providing information to farmers and Defra. Ensures consistency of approach by vets in all areas.</p>	<p>May undermine farmers' trust in local vets.</p>
<p>Guidance given to farmers</p> <p>21. It is unclear if the guidance given by Defra/Welsh Assembly Government is useful and/or followed by farmers.</p>	<p>Guidance given to farmers should be periodically assessed as to uptake and usefulness - which methods of delivering information are most useful?</p>	<p>Ensures information is delivered in the most effective way. Ensures guidance is being followed, so allows proper evaluation of its usefulness – aids progressive improvement of guidance.</p>	<p>Can lead to "survey fatigue" if undertaken too often. May be seen as Welsh Assembly Government "checking-up" on farmers.</p>

Comments/issues raised	Possible action/solutions	Pros	Cons
22. Guidance must be practical, scientifically proven, easy to implement and cost effective.	Base guidance on scientific findings. Ensure guidance is practical and able to be implemented in all cases or flexible enough to be tailored to individual farms. Get farmers/farmers' groups involved in the development of guidance. Undertake cost-benefit analysis on guidance. Offer financial assistance to implement guidance. Offer visits, training, helplines, advice, etc. to aid farmers in implementing guidance.	Guidance is more likely to be followed if it is seen as making sense and the industry has been involved in its development – improves transparency and fosters trust. Financial assistance supported by farmers.	May be logistically complex, time consuming and increased cost to develop. Potential lack of resources to undertake such development. Financial assistance may be costly.
23. It is unclear if on-going measures to disseminate good biosecurity practices are in place	Guidance and education should be continual and updated often - leaflets, visits, workshops, shows, greater involvement of vets.	Ensures farmers are kept up to date with information and advice.	May be seen as over-regulation or "pestering" by Welsh Assembly Government. Cost implications.
Sharing the cost of control between farmers and Govt.			
24. Costs should be met by the Government/taxpayer as TB control is a public health issue.	Continue with current situation.	Farmers support Government/taxpayer meeting compensation costs.	Compensation payments are drain on Welsh Assembly Government resources – money could be used elsewhere.

Comments/issues raised	Possible action/solutions	Pros	Cons
25. Costs are already shared – farmers provide co-operation and labour costs; government funds testing and compensation.	Continue with current situation.	See above.	See above.
26. Consequential loss compensation should be made available due to difficulty in getting insurance in some areas.	Provide consequential loss compensation – Government funded/industry funded/joint funded. Investigate ways of improving the insurance situation – discussions with insurance industry, Government funded insurance scheme, industry-funded insurance scheme.	Consequential loss payments supported by farmers, if funded by Government.	Consequential loss payments or Govt. funded insurance may contravene EU state aids rules. Farmers not supportive of compensation funded from within the industry. Welsh Assembly Government can do little about insurance premiums/availability of insurance provided by commercial companies.
27. Ireland and other countries have a levy to pay for TB compensation.	Introduce industry-levy to pay for testing and compensation.	Reduce Welsh Assembly Government compensation costs. Levy could be used to fund consequential loss compensation. Money saved could be directed to other areas of TB control. Reading University research indicates that testing charges and a compensation levy would not lead to a significant change in the number of dairy or beef cattle.	Would be opposed by farmers groups. Farmers in areas with little/no TB may object. Could be economically damaging to farmers if imposed only in hotspots. May contravene EU state aids rules.

Comments/issues raised	Possible action/solutions	Pros	Cons
Reduced farming in high TB areas			
28. Not supported by any group but may come about as a by-product of an inability to reduce the spread of TB.	-	-	-
Interface of TB testing with farm and food chain programmes			
29. Continued increases in TB pose a threat to the promotion of Welsh food and Wales. Integrating TB testing into other food chain programmes may improve traceability and consumer confidence.	Investigate the possibility of integrating TB testing into other food chain assurance schemes.	May improve food traceability.	Additional food assurance schemes may confuse producers/processors/consumers. Raising awareness of disease may impact consumer confidence in Welsh products.
<b>Management controls &amp; testing</b>			
Current testing regime			
30. Skin test is not reliable.	Develop a new test.	Improved test supported by all parties.	Lack of facilities. Increased cost. May duplicate research being done elsewhere. Long-term.
31. There have been delays in removing reactors from farms.	Increase resources to remove reactors.	May reduce the spread of TB and reduce length of movement restrictions. Supported by farmers.	Increased cost. Lack of resources.

Comments/issues raised	Possible action/solutions	Pros	Cons
32. Current testing regime does not comply with the EU TB Directive.	Increase testing frequencies to comply fully with Directive.	Supported by some farmers, vets and badger groups. Wales would be fully compliant with EU TB Directive and not liable for any penalties.	Increased cost. Lack of resources. More testing is stressful to cattle and requires more time input from farmers. Short-term increase in compensation payments due to increased detection of TB.
33. Testing should take place more often in all areas and annually (or biannually) in hotspots. Three- or four-yearly testing intervals are too long, some cattle may move without being tested.	Increase testing frequencies.	Less chance of missing incidences of TB – risk-averse testing policy. Less chance of cattle missing a test by being moved/bought/sold. Supported by some farmers, vets and badger groups.	Increased cost in terms of veterinary costs, farmers' time and labour. More testing is stressful to cattle. Lack of resources to carry out more tests. Short-term increase in compensation payments due to increased detection of TB.
34. Recording results, feedback from post mortems, outstanding tests, cattle movements from farms with TB is not efficient.	Improve data collection, monitoring and analysis and associated IT systems to speed up tracing cattle movements, action following a breakdown and reducing the number of overdue tests.	May reduce the spread of TB. Less chance of cattle missing a test. Supported by some farmers, vets and badger groups. Improves efficiency of existing resources – potentially low cost.	Lack of resources. May be seen as more bureaucracy.

Comments/issues raised	Possible action/solutions	Pros	Cons
Pre-movement, post-movement & pre-sale testing			
35. Pre- movement testing should be encouraged.	Introduce compulsory pre-movement testing. Use British Cattle Management Service's Cattle Tracking System to check pre-movement/pre-sale tests have been undertaken.	May reduce the spread of TB and formation of new hotspots. Less chance of cattle missing a test due to being moved or sold. Supported by NFBG and vets. Supported by some farmers groups in certain circumstances (if not economically disadvantaged).	Increased cost in terms of veterinary costs, farmers' time and labour. Lack of resources. Skin test is not accurate when applied at the individual animal level. May lead to supply and demand problems at markets if sufficient resources to do tests are not available. Cattle Tracking System contains anomalies and inaccuracies.
36. Post-movement testing should be encouraged.	Introduce compulsory post-movement testing.	May reduce the spread of TB and formation of new hotspots. Supported by vets. Supported by some farmers groups in certain circumstances (if not economically disadvantaged).	May cause problems for farmers that don't have sufficient isolation facilities. Skin test is not accurate when applied at the individual animal level.
37. Post-movement testing requires sufficient quarantine facilities on farms.	Provide assistance to farmers to develop required quarantine facilities.	See above.	Increased cost. Will take time for facilities to become operational.

Comments/issues raised	Possible action/solutions	Pros	Cons
38. Pre-movement/pre-sale testing should take place before cattle move out of hotspots.	Introduce compulsory pre-movement and/or pre-sale testing. Use British Cattle Management Service's Cattle Tracking System to check pre-movement/pre-sale tests have been undertaken.	Less costly than pre-movement/pre-sale testing of all cattle. Supported by vets. Supported by some farmers groups in certain circumstances (if not economically disadvantaged).	May financially/economically disadvantage farmers in hotspots. Requires more financial and veterinary resources to undertake tests. Skin test is not accurate when applied at the individual animal level. Cattle Tracking System contains anomalies and inaccuracies.
39. Most movements are trade issues, so farmers should pay for such tests, incorporating them into normal transaction costs.	Farmers pay for pre- and/or post-movement and/or pre-sale tests, if introduced.	No additional costs to Government.	Not supported by farmers. May financially/economically disadvantage farmers in hotspots.
40. TB status of the herd of origin should be available to potential buyers.	Require herd's TB status to be given to potential buyers/available at all auctions.		
Use of lay testers			
41. Use of lay testers not supported by most consultation responses.	-	May help in reducing any backlog in tests. May help with resource issues if increased testing is introduced.	Use of lay testers not supported by most consultation responses. Lay testers not able to help with other animal health/welfare issues. Use of non-veterinary testers may lead to a reduction in income for rural veterinary practices, potentially threatening their economic viability.

Comments/issues raised	Possible action/solutions	Pros	Cons
RTA survey			
42. Widespread use of Road Traffic Accident (RTA) survey supported by most responses.	Introduce RTA survey of badgers in all areas.	Useful source of information on TB in badgers in hotspots and other areas. May provide information on where new hotspots may occur. Supported by farmers groups and Countryside Council for Wales.	Increased cost. Lack of laboratory and testing resources. Not supported by the National Federation of Badger Groups until results of RTA trial are available.
43. RTA-killed badgers/badger and wildlife carcasses are not collected and disposed of in the same way as cattle carcasses.	Introduce collection and disposal of wildlife carcasses from areas where cattle may come into contact with them.	Supported by farmers. May reduce the risk of spread of TB among wildlife and from wildlife to cattle.	Increased cost. Lack of resources to collect and dispose of carcasses. Potentially logistically complicated.
44. RTA survey of other wildlife could be useful.	Investigate the costs and benefits of RTA survey of other wildlife e.g. deer.	Supported by farmers. Potential to reduce the risk of spread of TB among wildlife and from wildlife to cattle. Cost-benefit analysis relatively low cost.	Full investigation would be costly.
Organisational arrangements			
45. A risk-based approach to TB control is favoured by many with higher risk areas having more frequent tests and movement restrictions or pre-movement testing taking place between high and low risk areas.	Introduce zoning and controls between high and low risk zones.	Reduce risk of spreading TB to areas with no/low incidence. Zoning is potentially less costly than other policy options according to a Reading University study.	Potential trade and economic impacts on areas classed as high-risk. Much of Wales is likely to be classed high-risk. Impact may be wider than just farming – may impact on tourism if the general public is not fully informed/educated about the zoning.

Comments/issues raised	Possible action/solutions	Pros	Cons
Scope for Wales-specific controls			
46. Wales has no testing or laboratory facilities of its own.	Create laboratory, testing and research facilities in Wales.	Ability to undertake testing and research tailored specifically to Wales.	Increased cost – initial set-up costs and on-going staffing and operational costs. May duplicate research being done elsewhere.
47. Wales has the chance to implement changes specific to Welsh needs.	Introduce policies / measures specific to Wales that may differ from GB measures. Create a Welsh stakeholders group to advise Welsh Assembly Government on Wales-specific TB issues.	Supported by farmers groups. Increase participation of farming and related industries in the consultation and decision-making process. Relatively low cost.	May be viewed as a “talking shop” that doesn’t lead to any action being taken – could be viewed as tokenism.
48. TB is a GB-wide problem; there are no border controls between England and Wales and some farms straddle to border. TB controls should, therefore, be applied at the GB level.	Act with Defra to develop England and Wales policy only.	Relatively low cost. Joint action with Defra ensures consistency across the England-Wales border. Supported by vets and some wildlife groups.	May be seen as taking no action.

Comments/issues raised	Possible action/solutions	Pros	Cons
<b>Wildlife</b>			
49. Badgers are a reservoir for TB and are widely believed to be involved in the infection of cattle with TB.	Introduce badger controls in some areas e.g. high-risk areas/hotspots/around breakdown farms.	May reduce the spread of disease from wildlife to cattle. May reduce the risk of breakdowns re-occurring. Supported by many farmers.	Culling may increase the level of TB in cattle – perturbation effects - Krebs reactive culling trial results. Would be opposed by badger groups. Reasons for culling may not be understood by the general public. Cost of implementation/management of culling. Proactive culling is potentially the most costly policy option according to a Reading University study.
50. The extent to which badgers are involved in the spread of TB is not known.	Carry out research into the spread of TB from badgers to cattle.	Increase knowledge of disease and epidemiology.	Increased cost. Long-term. Lack of resources. May duplicate work already being undertaken by/on behalf of Defra (Krebs) and in Ireland (FAP).
51. Removing badgers may lead to an increase in the spread of TB – perturbation effects.	Do not undertake badger removal operations until perturbation is more fully understood.	Does not risk unnecessarily increasing the spread of TB. Supported by badger groups and scientists.	May be seen as doing nothing/delaying tactic.

Comments/issues raised	Possible action/solutions	Pros	Cons
52. It is unclear what effect removing badgers may have on the ecosystem.	Investigate the ecosystem effects of badger removal operations.	Increase scientific knowledge.	Increased cost. Long-term. Lack of resources. May duplicate work already being undertaken by/on behalf of Defra.
53. Wildlife other than badgers may be involved in spreading TB e.g. deer, polecats	Research TB incidence and spread in wildlife	Increase knowledge of risks from wildlife.	As above.
54. Testing for TB in live badgers is imperfect – false negatives are possible.	Develop a reliable test that can be used on live badgers.	Improve knowledge of TB in badgers and epidemiology. Enable research to be undertaken without culling badgers.	As above.
55. Tests for TB in other wildlife are not available.	Develop tests for other wildlife that may be implicated in the spread of TB.	Improve knowledge of TB in wildlife and epidemiology.	As above.
<b>Other Comments</b>			
56. There is no one single solution to the problem; an holistic approach is needed.	Use a combination of control options.	Can combine variety of options to tailor TB policy to suit Wales in the most cost-effective way.	Evaluating the success of individual control options is difficult, evaluating which combination of options would be most effective would be complex.



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