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Bovine TB – comparative models for compensation and eradication/control.

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This paper provides a comparison of the Bovine Tuberculosis compensation, eradication and control systems currently in operation within Northern Ireland, Ireland, England, Scotland, Wales, Australia, Canada, New Zealand and the United States of America.

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Key Points

- Bovine Tuberculosis is caused by the bacterium *Mycobacterium bovis* which can also affect humans, deer, goats, pigs, dogs and cats, as well as many others mammals including badgers;
- The symptoms of Bovine TB can take months to exhibit in cattle but in the late stages of the disease common symptoms include emaciation, a low-grade fluctuating fever, weakness and lack of appetite. Bovine TB affects the health and welfare of cattle, lowers productivity and fertility and consequently impacts on herd keepers' profitability;
- Bovine TB free status is internationally defined and agreed as being in effect when the incidence of TB in herds is below 0.2% for 3 consecutive years;
- It has been DARD's (and its predecessor departments) policy to eradicate the disease within Northern Ireland since 1964;
- There are currently 1.58 million cattle within Northern Ireland spread across 25,930 active herds, with dairy cows/heifers accounting for 21% of the national herd while beef cows/heifers account for 18%;
- Bovine TB herd incidence within Northern Ireland peaked in 2002 when the annual herd incidence was calculated at 10.2%. Individual animal incidence peaked in 2003 when just under 1% of animals tested proved positive;
- The 2010 herd incidence rate was 5.12% and the individual animal incidence rate was 0.405% (based on August 2011 figures);
- DARD currently pays compensation for TB reactor cattle at 100% of market value of the animal/animals involved;
- DARD recently undertook a second public consultation on the issue of compensation arrangements for Bovine TB and Brucellosis. The consultation documentation included proposed options for the introduction of a compensation cap;
- On an annual basis DARD submits a Bovine TB monitoring, eradication and control programme to the European Commission as a pre-requisite for EU co-financing. This programme outlines mechanisms dealing with animal testing, slaughter of TB reactors, movement controls, biosecurity, risks from wildlife, vaccination and areas for further research;
- Many EU countries are Bovine TB free (incidence of less than 0.20%) and in those countries where this is not the case such as Spain it was extremely difficult to access recent data in English relating to incidence rates, compensation levels and eradication/control measures;

- Compensation mechanisms and rates of payment for Bovine TB differ across the countries referred to in this report (Australia, Canada, England, Ireland, New Zealand, Scotland, the USA and Wales);
- Eradication and control provisions for Bovine TB are also varied.

Executive Summary

The eradication of Bovine TB has been a priority for DARD (and its predecessor departments) since 1964. The disease, which is caused by the *Mycobacterium bovis* affects the health and welfare of cattle, lowers productivity and fertility and consequently impacts on herd keepers' profitability.

Under internationally defined standards, for a country to be defined as Bovine TB free there must be a herd incidence rate of less than 0.2% for 3 consecutive years. Whilst the incidence of Bovine TB within Northern Ireland does appear to be declining the most recently available data points to a herd incidence rate of 5.12%.

At present DARD is currently conducting a second public consultation on the issue of compensation schemes for Bovine TB and Brucellosis. The current compensation scheme operates on a basis that farmers receive 100% of the market value of any TB reactor cattle. The public consultation document contains different proposals for the introduction of a cap in compensation.

With regard to the monitoring, eradication and control of Bovine TB, as part of the requirement for accessing EU co-financing, DARD develops and submits an annual programme setting out a series of specific measures and actions. The most recent plan submitted in April 2011 contains details covering animal testing, slaughter of TB reactors, movement controls, biosecurity, risks from wildlife, vaccination and areas for further research.

Looking at the incidence of Bovine TB within a wider context it is apparent that Northern Ireland has a higher herd incidence rate than many nations, both local and further afield. It is also worth noting that many EU nations have achieved Bovine TB free status.

Compensation rates and payment mechanisms across the UK and wider world are varied. Whilst some schemes (mainly within the UK) are close to that operated within Northern Ireland, it is evident that some other countries operate schemes which utilise different compensation calculation methods and also in some instances require inputs from the industry. Some systems also contain additional features designed to supplement the income of affected farms in the months following herd depopulation.

On the issue of eradication and control it is evident that the approaches taken within different countries also varies widely but also appears to be multi faceted. Whilst there would appear to be some commonality in relation to the issue of testing, there is much greater variation in relation to the approaches taken to movement control for example. Biosecurity measures would also appear to vary in both their scale and focus as do approaches to the reduction of wildlife vector risk from animals such as deer, possums and badgers.

A common thread across many nations appears to be on the need to develop vaccines for either cattle or wildlife vectors as a cost effective means of reducing or eradicating the incidence of Bovine TB, but it is evident that much of this work is at an early stage and as such will require further research and investment.

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1 Context and background

This research paper provides an overview of the scale of Bovine TB within Northern Ireland as well as outlining some of the differing approaches to compensation and eradication/control in other selected countries.

Bovine Tuberculosis is caused by the bacterium *Mycobacterium bovis* which can also affect humans, deer, goats, pigs, dogs and cats, as well as many other mammals including badgers.

The symptoms of Bovine TB can take months to exhibit in cattle but in the late stages of the disease common symptoms include emaciation, a low-grade fluctuating fever, weakness and lack of appetite. Bovine TB affects the health and welfare of cattle, lowers productivity and fertility and consequently impacts on herd keepers' profitability.

Bovine TB free status is internationally defined and agreed as being in effect when the incidence of TB in herds is below 0.2% for 3 consecutive years¹.

2 Bovine TB within Northern Ireland

2.1 Incidence

It has been DARD's (and its predecessor departments) policy to eradicate the disease within Northern Ireland since 1964.

There are currently 1.58 million cattle within Northern Ireland spread across 25,930 active herds, with dairy cows/heifers accounting for 21% of the national herd while beef cows/heifers account for 18%².

Bovine TB is recognised as a scheduled and notifiable disease under the Diseases of Animals (Northern Ireland) Order 1981, and as such farmers are required to inform DARD of any suspected or confirmed cases within their livestock.

As well as a mandatory annual skin test for TB as set out in EU Directive 64/432³ farmers are encouraged to regularly check their cattle for TB symptoms such as lesions as well as subjecting all herds to an annual test..

As shown in figure 1 below, Bovine TB herd incidence peaked in 2002 when the annual herd incidence was calculated at 10.2%. Individual animal incidence peaked in 2003 when just under 1% of animals tested proved positive.

¹ [Chapter 11.6, Bovine Tuberculosis, Terrestrial Animal Health Code, World Organisation for Animal Health \(OIE\)](#)

² TB monitoring, eradication and control programme 2012, DARD, submitted to EC 15th April 2011

³ [Council Directive 64/432/EEC of 26 June 1964 on animal health problems affecting intra-Community trade in bovine animals and swine.](#)

The recent trend for both herd and individual animal incidence appears to be downward but it should be recognised that the figures recorded in 2010 are still higher than those recorded from 1995-1997. **As things currently stand the 2010 herd incidence rate was 5.12% and the individual animal incidence rate was 0.405%.⁴**

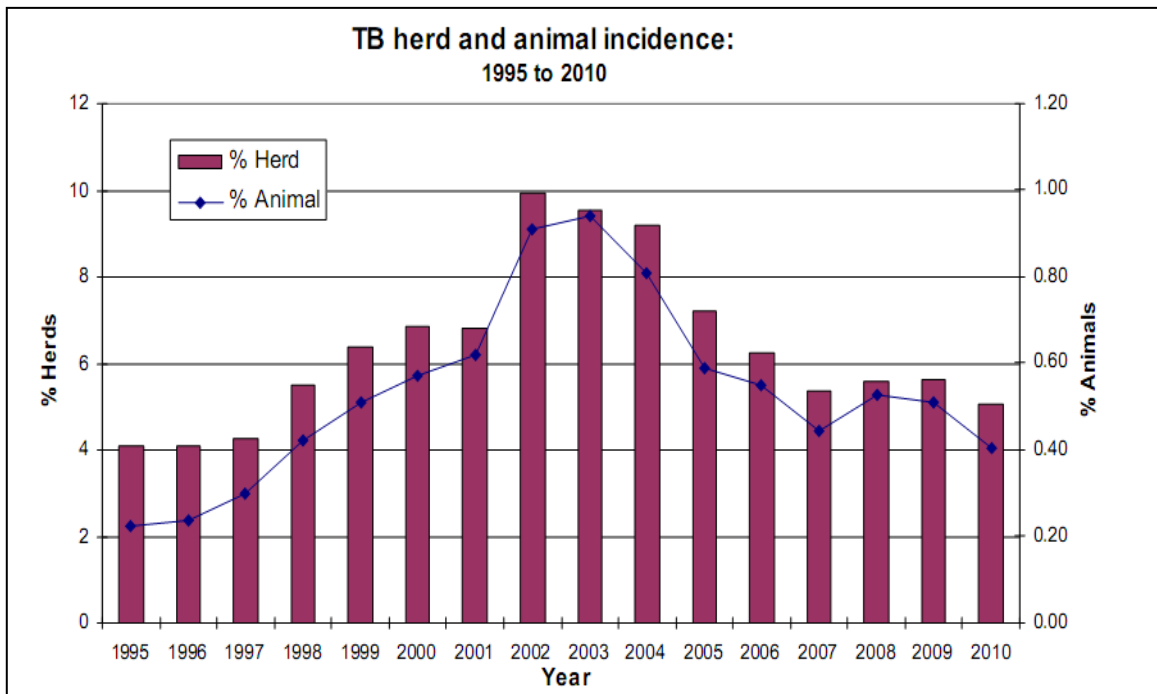


Figure 1: Bovine TB and animal incidence within Northern Ireland, 1995 - 2010⁵.

As shown in figure 2 the most recent quarter for which data is available also witnessed a 2% increase in the number of TB reactors (1,395 TB reactors cf. 1,365 during the same period in 2010⁶) compared to the same quarter in 2010. The number of reactors did peak in 2003 but the fact remains that the current number of reactors is still higher than the figures recorded between 1995 and 1997.

⁴ Full year data for 2010 derived from [Tuberculosis - internet monthly statistics - August 2011, DARD](#)

⁵ [Bovine brucellosis \(BR\), bovine tuberculosis \(TB\) and bovine spongiform encephalopathy \(BSE\), Quarterly Update: April - June 2011, DARD Quarterly Disease Report](#)

⁶ *ibid*

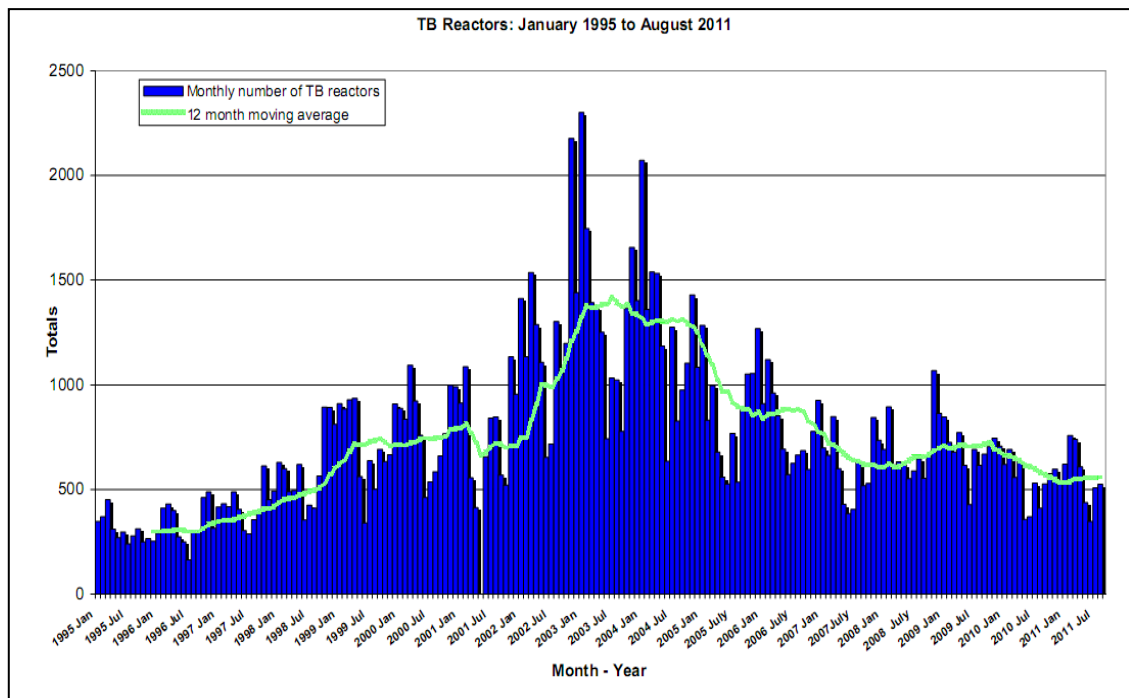


Figure 2: Bovine TB reactors within Northern Ireland, January 1995-August 2011⁷

2.2 Compensation provisions

As things currently stand and under the auspices of the Tuberculosis Control Order (Northern Ireland) 1999⁸, DARD will pay compensation for animals testing positive for TB at 100% of market value of the animal/animals involved.

According to the Order the market value of an animal means—

(a) in the case of an animal over 30 months old either—

(i) the price which might reasonably have been obtained for it at the time of valuation from a purchaser in the market if it had been free from disease; or

(ii) the value of that animal to the owner had it been slaughtered under and in accordance with Commission Regulation (EC) No. 716/96⁹ adopting exceptional support measures for the beef market in the United Kingdom(5),.

whichever is the higher; or

(b) in the case of an animal 30 months old or under, the price which might reasonably have been obtained for it at the time of valuation from a purchaser in the market if it had been free from disease..

⁷ [Tuberculosis - internet monthly statistics - August 2011. DARD](#)

⁸ [Tuberculosis Control Order \(Northern Ireland\) 1999](#)

⁹ [adopting European Commission Regulation \(EC\) 716/96 exceptional support measures for the beef market in the United Kingdom](#)

Valuations to determine market value are decided by agreement between an inspector of the Department and the owner of the animal, or failing that are decided by an independent valuer paid by the Department and selected by the owner from a list of at least three such valuers submitted by the Department to the owner.

As a result of Article 11A the Tuberculosis Control (Amendment) Order (Northern Ireland) 2005¹⁰:

The Department (DARD) or the owner of the animal may submit an appeal to a tribunal of persons, appointed by the Department for the purpose, if dissatisfied with the determination of the market value of any animal –

(a) in the case of an appeal by the Department, under Article 11(6)(b), or

(b) in the case of an appeal by the owner, under Article 11(6)(b), (7) or (11).”

DARD is currently undertaking a second public consultation on the issue of compensation arrangements for Bovine TB and Brucellosis. This consultation period will close on the 2nd December 2011 and contains a number of options for changes to Bovine TB and Brucellosis compensation as follows:

- Introduce separate compensation caps for commercial and pedigree animals based on the NI average market value data (commercial animals) and an uplift of £800 (for pedigree animals);
- Introduce a cap similar to that used in the South of Ireland; and
- Introduce separate caps for commercial and pedigree animals based on the NI average market value data (dairy commercial animals) and an uplift of £300 (for pedigree animals). This is an extension of the existing approach used for brucellosis reactors.

2.3 Eradication/Control provisions

As stated previously DARD policy since 1964 has been the eradication of Bovine TB. On an annual basis DARD submits a Bovine TB monitoring, eradication and control programme to the European Commission as a pre-requisite for EU co-financing.

The most recently submitted document for the year 2012 reveals that DARD takes a strategic approach to both the eradication of Bovine TB and the design of the programmes to achieve this objective.

A new management structure is now in place within the department based in 3 key components as follows:

- TB Steering Group – to oversee strategic direction.
- TB Policy Development Group – to develop proposals / manage specific projects.

¹⁰ [Tuberculosis Control \(Amendment\) Order \(Northern Ireland\) 2005](#)

- TB Programme Delivery Group – to ensure effective delivery of this programme and monitor key performance indicators.

Since 2008, and in line with the views of the then Minister, Michelle Gildernew MLA¹¹, DARD has continued to pursue a policy focused on the eradication of bovine TB. The approach that continues to this day is essentially 3 stranded:

- control cattle to cattle spread;
- address any wildlife component; and
- create a partnership with the agricultural industry in the delivery of the strategy.

Table 1 below sets out the current Bovine TB monitoring, control and eradication methods employed within Northern Ireland.

Measure	Specific details
Testing	<p>Annual testing of all herds is mandatory</p> <p>TB testing is undertaken only by DARD approved Veterinary Surgeons, using the Single Intra-dermal Comparative Cervical Test (SICCT) for internal control</p> <p>All animals slaughtered for human consumption undergo Post Mortem Examination (PME). Results are available on the Animal and Public Health Information System (APHIS) immediately</p> <p>All herds in NI at all times are allocated an OT herd status, a herd status reason, and a next test type. The herd status may only be officially tuberculosis free (OTF), officially tuberculosis suspended (OTS), or officially tuberculosis withdrawn (OTW).</p> <p>Failure to test a herd on an annual basis results in the OTF status being suspended immediately in all cases.</p> <p>Further delay in testing will result in automatic increased movement sanctions and downgrading the herd status to OTW</p> <p>In NI, animals are allowed one skin test with an inconclusive result without compulsory removal.</p> <p>A non-negative result at a second consecutive test results in mandatory removal as a reactor animal.</p> <p>Herdkeepers may be advised to slaughter the animal at any time during this period.</p> <p>Contiguous tests are undertaken in herds that are in close proximity to infected herds, usually neighbouring them</p>
Slaughter of TB reactor animals	<p>Confirmed TB reactors are removed by DARD subcontracted hauliers for immediate slaughter.</p> <p>Slaughter may include full herd depopulation if considered necessary to stop spread of the disease.</p> <p>In the case of total herd depopulations the following action is taken:</p> <ul style="list-style-type: none"> •No animals are allowed to move into the premises for one month following the depopulation. •A full Cleansing and Disinfection is required after depopulation. •The herdkeeper is advised of the control of risk from slurry. •Two months after re-stocking a TB test is required. If this test occurs within a year of the breakdown it is classed as reactor (RH1) test. If the RH1 is clear the restriction is removed and then a post restriction test (CHT) is set for six months later and an Annual Herd Test set twelve months after the completion of the post-

¹¹ [Gildernew sets course for way ahead in TB fight, DARD press release, 9th December 2008.](#)

	<p>restriction test. If a farm premises is depopulated for more than 12 months then the restriction is removed at 12 months and the test following the purchase of animals is classed as an Annual Herd Test.</p>
Movement controls	<p>All calves born after 1 January 1998 must be identified with an ear tag in each ear within 20 days from the birth of the animal. All cattle identification numbers are authorised by DARD and recorded on the Animal and Public Health Information System (APHIS) computer database so that no duplication should be possible.</p> <p>Movement control from all herds, at all times, is controlled by a combination of the OT herd status and status reason applicable to the herd. As all movements must be recorded on APHIS, including those to market and abattoir, immediate movement control is applied.</p> <p>Since the year 2000 the implementation of movement control documents require a producer to notify the Department within 7 days of an animal either leaving or arriving on his/her farm. Markets are required to notify movements on and off to the Department by the end of the next working day. However, in the case of a restricted animal the producer is required to obtain a movement licence from the Department in advance of moving the animal out of his/her herd. All movements are recorded and can be traced on APHIS</p> <p>Herds with either OTS and OTW status applied are both subject to movement restrictions immediately. This is controlled through APHIS</p> <p>Where a test becomes overdue, increasingly stringent movement controls are applied routinely as below:</p> <ul style="list-style-type: none"> •Immediately overdue, no live moves to market, export, or other holdings. •1 month overdue, no live moves to market, export, other holdings or slaughter. No moves in are allowed except one breeding bull on exceptional licence. <p>All animals over 42 days are subject to the single intradermal test and interpretation within 30 days of export</p>
Biosecurity	<p>A TB Biosecurity Study is currently underway in a TB high incidence area in Co. Down. The Study is designed to compare farm characteristics in both herds that have recently had a TB breakdown and those that have had no recent history of a breakdown in this TB high incidence area.</p> <p>Consideration of selected cattle and wildlife risk factors are key elements of this research. As well as establishing relevant farm business information, a survey of on-farm buildings and a farm boundary survey are being carried out. Radial badger sett survey work on and around the main farm buildings of participating farms is also being undertaken. The findings of the Study should be available by the middle of 2012. The conclusions will inform evidence-based biosecurity advice to be provided to livestock farmers and will inform policy decisions.</p> <p>All herdkeepers are currently sent an advisory booklet on biosecurity measures http://www.dardni.gov.uk/biosecurity_code_booklet_for_northern_ireland_farms.pdf</p>
Wildlife	<p>TB been isolated from deer and badgers in Northern Ireland.</p> <p>A survey carried out in 1995, in which deer of the three species found here were sampled, demonstrated a prevalence of 5.8% (397 deer sampled). A small surveillance exercise carried out in 2009, in which fallow and sika deer were sampled, revealed a prevalence of 2% (146 deer sampled). The low number of deer (less than 3,500 estimated), their restricted range, limited contact with cattle, and the enteric nature of the infection, suggests that their role in the epidemiology of bovine TB is likely to be limited if not entirely insignificant</p> <p>With regard to badgers A Badger Stakeholder Group was formed in 2004 in NI, which was tasked with assessing the available information and considering the potential need for a badger management strategy within NI.</p> <p>Following consideration by the Badger Stakeholder Group of the evidence</p>

	<p>available from the completion of various extensive trials elsewhere (most notably the Randomised Badger Culling Trial in GB) and the adoption of lethal intervention as a policy to control bovine TB in cattle in another Member State (the Republic of Ireland (ROI)), it was concluded in their report, published February 2008, that no recommendation could be made on the way forward for Northern Ireland without first undertaking work to gather information specific to the Northern Ireland situation. The Badger Stakeholder Group agreed that this should include:-</p> <ul style="list-style-type: none"> • a survey of the badger population in Northern Ireland to determine the number and distribution of badgers (completed in 2008), • developing a proposal for a study of the prevalence of bTB infection in badgers (ongoing), • assessing the available evidence in relation to the role of badgers in bovine TB to inform an appropriate course of action in NI, including whether it is appropriate to run a badger culling pilot (ongoing), • considering participation in a vaccination trial, and • undertaking a cost benefit assessment of the future options for any proposed badger management strategy in NI, once the information arising from the above actions is available.
Vaccination	<p>DARD continues to develop collaborative links with work ongoing in England and ROI regarding the development and trialling of vaccines for bovine TB in badgers. Vaccines developed for badgers may be the most feasible solution in the long term administered by either injection or orally.</p> <p>DARD also maintains an interest in ongoing work by Defra on the development of a so called DIVA (Differentiating Infected from Vaccinated Animals) test which would enable the vaccination of cattle, although this would also require a change in EU law (current EU Directive 78/52/EEC- article 13ii prohibits vaccination¹²) to make vaccination with BCG and the use of a DIVA test legal. This development is however some way off at this time.</p>
Research	<p>DARD continues to work in partnership with the NI Agri-Food and Biosciences Institute (AFBI) to establish critical knowledge gaps in relation to TB and to identify and explore further research and development options that would complement and assist current research.</p> <p>DARD has commissioned AFBI and DARD's Veterinary Epidemiology Unit (VEU) to conduct a number of literature reviews which will help identify and fill critical knowledge gaps in relation to bovine TB generally and also to wildlife in particular. The TB literature reviews being carried out by AFBI are: (i) cattle to cattle transmission; (ii) badger to cattle transmission; (iii) cattle bTB tests and effective deployment; and (iv) bTB tests in badgers. In addition, DARD's VEU is currently conducting a literature review on badger vaccines. It is anticipated that these reviews will better inform DARD in relation to future TB R&D projects.</p>

Table 1: Current Bovine TB monitoring, control and eradication measures employed in Northern Ireland¹³

¹² [Council Directive 78/52/EEC of 13 December 1977 establishing the Community criteria for national plans for the accelerated eradication of brucellosis, tuberculosis and enzootic leukosis in cattle](#)

¹³ Derived from DARD Bovine TB programme for monitoring, eradication and control of Bovine TB, submitted to the European Commission, 15th April 2011.

3 Bovine TB Incidence and Approaches to compensation and eradication/control within other selected jurisdictions.

The initial thinking behind this paper had been to compare the Bovine TB situation in Northern Ireland with Ireland, the rest of the UK and other EU nations. An initial scan of the data however revealed that many EU countries are Bovine TB free (incidence of less than 0.20%) and in those countries where this is not the case such as Spain it was extremely difficult to access recent data in English relating to incidence rates, compensation levels and eradication/control measures.

With this caveat in mind the focus for the remainder of this paper is on those nations for which data on incidence rates, compensation levels and eradication/control measures was both up to date and accessible.

3.1 Incidence

Country	Herd incidence %
Australia	Officially Bovine TB free since 2002
Canada	Officially Bovine TB free (State of Manitoba has split status due to some incidence)
England	8.72% ¹⁴
Ireland	4.65% (31/12/2010) ¹⁵
New Zealand	0.13% (30/6/2010) ¹⁶
Scotland	Officially Bovine TB free since 2009 (herd incidence rate of 0.18% in 2010 ¹⁷)
USA	Officially Bovine TB free with exception of states of California (1 positive herd in 2011 so far ¹⁸), Michigan(4 positive herds in 2010 ¹⁹), Montana and New Mexico which are working towards TB free status.
Wales	6.57% ²⁰
Northern Ireland	5.12%

Table 2: Bovine TB herd incidence rates - selected countries

In compiling the data outlined in table 2 it needs to be recognised that the comparison of herd incidence rates across different jurisdictions needs to be treated with extreme caution, if not avoided all together, given the differing approaches to testing employed

¹⁴ Defra do not provide Bovine TB herd incidence statistics and this figure is derived from Detailed TB statistics 1 Jan to 31 Dec 2010 by taking the number of Total New TB incidents as a proportion of the Total number of herd tests conducted. One of the problems with this form of incidence calculation, is that it doesn't take into account risk based testing. Herds in higher risk areas are tested on an annual basis, whereas herds in lower risk areas are tested every second, third or fourth year. The problem with this from the incidence point of view, is that as you change the testing policy, you influence the incidence rate. [Detailed TB Statistics, GB by region, 1 Jan to 31 Dec 2010, Defra](#)

¹⁵ [Bovine TB statistics, Department of Agriculture, Fisheries and Food, DAFF website, 19th September 2011](#)

¹⁶ [Annual Report for the year ending 30th June 2010, Animal Health Board of New Zealand](#)

¹⁷ Derived from Defra data [Detailed TB Statistics, GB by region, 1 Jan to 31 Dec 2010, Defra](#)

¹⁸ [Information about Bovine TB, State of California Department of Food and Agriculture, website, 20th September 2011](#)

¹⁹ [Bovine TB positive testing herd statistics, State of Michigan Department of Agriculture website](#)

²⁰ Derived from Defra data [Detailed TB Statistics, GB by region, 1 Jan to 31 Dec 2010, Defra](#). The Welsh figures may well be lower than the English figures as a result of The Welsh Government currently having an annual testing policy for all herds, including the lower risk herds in the north of Wales, which will partially explain why the incidence rate in Wales is lower than in England – in effect the impact of high risk areas is diluted by the tests from low risk areas.

(see footnotes relating to England and Wales by way of example) and the impact this can have on incidence rates.

In light of these limitations with herd incidence data DARD epidemiologists are currently finalising work with colleagues from GB and Ireland that should enable a comparative analysis of Bovine TB disease trends over time, and a paper outlining this work is due to be published shortly.

3.2 Compensation provisions

Country	Compensation scheme details
Australia	Despite Bovine TB free status, compensation is payable at 'farm gate value' for positive reactors under the auspices of the Emergency Animal Response Disease Agreement which is an agreement between government and industry on how to manage cost and responsibility for an emergency response to an animal disease outbreak. Under this Agreement Bovine TB is defined as a category 4 disease and as such any compensation paid is split between the government 20% and the industry 80% . ²¹
Canada	Under the Compensation for Destroyed Animals Regulations ²² which are part of the Health of Animals Act ²³ compensation is payable at market value that the animal would have had at the time of its evaluation if it had not been required to be destroyed . Payments are up to a maximum of \$CN 8000 for registered animals and \$CN 2,500 for non-registered animals .
England	Compensation for animals slaughtered because of bovine TB is determined primarily through table valuations, based on average market prices for 47 pre-determined cattle categories . Table value rates are updated monthly and published, as compensation information bulletins ²⁴ , at the start of each calendar month, on the Defra website. On rare occasions it may be necessary to use individual on-farm valuations to determine compensation. Individual animals are only recognised as "pedigree" when a pedigree certificate has been issued by a recognised breed society by the day of the assessment of the category into which the animal falls
Ireland	On Farm Market Evaluation Scheme main measure employed – removed animals are compensated at market value (equivalent price which might reasonably have been obtained for the animal at the time of determination of compensation) determined by independent valuer to a ceiling of €2,800 per individual animal (inclusive of factory salvage price) , except in respect of one pedigree stock bull per breakdown episode with a ceiling of €3,500 (inclusive of factory salvage price) ²⁵ . Currently herdkeepers in the south of Ireland contribute through a production levy (currently €1.27 per animal and €0.0006 per litre of milk) towards the cost of the TB

²¹ [Frequently Asked Questions, Emergency Animal Response Disease Agreement, Animal Health Australia website.](#)

²² [Compensation for Destroyed Animals Regulations 2000](#)

²³ [Health of Animals Act 1999](#)

²⁴ [Table showing compensation for Bovine TB, BSE, Brucellosis and Enzootic Bovine Leukosis, September 2011, DEFRA website, 31 August 2011](#)

²⁵ [Compensation Arrangements for TB and Brucellosis - Important Information for Farmers Booklet \(Revised June 2009\), Department of Agriculture, Fisheries and Food website](#)

	<p>and brucellosis eradication schemes with the remainder being from public funds and the EU Veterinary Fund. The revenue from the producer levies was approximately €5m in 2010.</p> <p>Other measures which could be classified as compensatory are provided in support of herd keepers with infected cattle as follows:</p> <ul style="list-style-type: none"> • Depopulation grant - An owner/keeper whose herd is depopulated (totally or partially) in the interest of disease control may qualify for a Depopulation Grant, which is designed to compensate farmers for income lost during the rest period up to a maximum of €228.52 per animal; • Income Supplement - payable in cases where disease breakdown results in the removal of more than 10% of animals in a herd and where depopulation is not deemed appropriate. Payment is in respect of each animal removed as a reactor from a herd, subject to a maximum of 100 animals qualifying for payment up to a max of €38.09 per animal; • Hardship Grant - The Hardship Grant eligibility period runs from 1 November to 30 April. This Scheme is designed to alleviate the costs difficulty of some owner/keepers whose holdings are restricted on foot of a herd re test and where animals are retained and fed during periods of restriction. Potentially eligible owner/keepers must meet certain conditions including requirements that they (i) must not have any income from milk sales and (ii) must not have any off farm income. The Grant may provide eligible owner/keepers with a payment of up to €250.00 per month for a period not exceeding 4 months within the period 1 November to 30 April of the following year.
New Zealand	<p>Payable at a rate of 65% of the fair market value of each reactor animal, up to the maximum allowable as defined in the Biosecurity (National Bovine Tuberculosis Pest Management Strategy) Order 1998.²⁶</p> <p>Owners of Tb Reactor cattle which are eligible for compensation, are not liable for the cost of transporting these animal(s) to slaughter or for slaughter fees.</p>
Scotland	<p>In line with provisions of The Tuberculosis (Scotland) Order 2007²⁷ compensation is payable at 100% of market value of animals. Valuations of market value can either be agreed between the owner and government, be made by 1 valuer agreed by the owner and government, made by 2 valuers, 1 appointed by government and other by owner, or failing agreement 1 valuer can be appointed by the Institute of Auctioneers and Appraisers in Scotland.</p>
USA	<p>Fair market value (based upon prices achieved at markets) up to \$3000 per animal testing positive for Bovine TB, minus any amount received for slaughter, if sent to slaughter. Transportation costs to slaughter are also often paid either in full or partially. Valuations are completed by either APHIS staff, private valuers or by the use of a valuation calculator using a few key parameters.²⁸</p> <p>Questions remain over whether the Federal Government has the budget to continue to pay this compensation for all animals testing positive.</p>
Wales	<p>Under Tuberculosis (Wales) Order 2010²⁹ new system in place to encourage better practice by cattle keepers. Compensation is now calculated using the following formula:</p>

²⁶ [National Operational Plan: 1 July 2005-30 June 2013. National Bovine Tuberculosis Pest Management Strategy. Animal Health Board, New Zealand.](#)

²⁷ [Tuberculosis \(Scotland\) Order 2007](#)

²⁸ Email from Dr Stephen Ott., Appraisal-Indemnity-Compensation Specialist, APHIS, USDA.

²⁹ [Tuberculosis \(Wales\) Order 2010](#)

	<u>Market value of animal</u> (provided by independent assessor) X <u>multiplier based on compliance with TB testing times, adherence to legislation and best practice guidance</u> = <u>level of compensation paid</u> .
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Table 3: Bovine TB compensation arrangements - selected countries

3.3 Eradication/Control provisions

Country	Eradication/Control programme details
Australia	<p>Australia's national eradication campaign (Brucellosis and Tuberculosis Eradication Campaign or BTEC) ran for 27 years from 1970 to 1997, achieving freedom from bovine TB by OIE standards on 31 December 1997. BTEC included the following measures:</p> <ul style="list-style-type: none"> • TB detection through meat inspection and systematic field testing; • quarantining and repeated testing of infected herds; • movement controls to prevent TB spreading between herds; and • slaughter of animals with high risk of infection and those returning positive tests, with compensation paid to the owners. <p>Starting in 1973, the cattle industry made major contributions to the funding of BTEC through levies.</p> <p>Following eradication of the disease Tuberculosis Freedom Assurance Programmes (TFAP) ran from 1998-2002 (Part1) and from 2003-2006 (Part 2) in order to 'mop up' any residual disease. These programmes included measures such as:</p> <ul style="list-style-type: none"> • maintenance of a TB case register; • Effective surveillance was achieved via the National Granuloma Submission Program; • providing policy advice, legislation and all infrastructure to support diagnostic and eradication activities; • reviewing and revising surveillance schemes for TB; • using herd surveillance programs where required; • using tail or ear tags to identify cattle to their property of origin; • eradicating infection from infected herds, providing compensation and additional assistance measures for affected producers. <p>At present Australia has its Emergency Animal Disease Response Agreement³⁰ ('EADRA) which a contractual arrangement that brings together the Commonwealth, state and territory governments and livestock industry groups to collectively and significantly increase Australia's capacity to prepare for, and respond to, emergency animal disease (EAD) incursions. Bovine TB is recognised as a category 4 disease and as such there are surveillance, control, removal and compensation measures contained within this mechanism.</p>
Canada	<p>Bovine TB is a reportable disease under the Health of Animals Act and Regulations and Canada follows a strict surveillance and eradication program for this disease.</p> <p>In terms of surveillance routine slaughter granulomas are supplemented by on-farm testing where:</p> <ul style="list-style-type: none"> • Sector has insufficient slaughter numbers (farmed cervids (elk and deer)) • Risk of disease from wildlife exists (Riding Mountain – Manitoba – risk from elk and deer)

³⁰ [EAD Response Agreement, Animal Health Australia website.](#)

	<p>Under the National Bovine TB Eradication Program, whenever the infection is confirmed in a herd of cattle, farmed bison, or farmed cervids (elk and deer), the CFIA(Canadian Food Inspection Agency) institutes disease eradication measures that include³¹:</p> <ul style="list-style-type: none"> • Aggressive stamping out policy applied: ❖ Automatic depopulation of all exposed susceptible animals required since 1983 for all infected herds required; • Province/zone accreditation based on disease findings: ❖ All provinces, including split-status province of Manitoba, are classified as TB-free (equivalent to accredited-free under US programme) • Control movement out of province/zone that loses TB-free status: • Triggers regulations requiring permit from CFIA – all imported animals from outside Canada must originate from an officially TB free country/zone/herd; and be tested for TB prior to import with negative results; and be accompanied by an official veterinary health certificate. Animal imports from Mexico are also banned. <p>In areas of wildlife risk such as Manitoba, Canada also implements bio security measures to reduce the risk to wildlife infecting domestic cattle that include the following measures:</p> <ul style="list-style-type: none"> • Ban on any baiting or feeding of elk & deer; • Require hay to be removed from fields to be eligible for crop insurance; • Prescribed burns to improve elk habitat; and • Barrier fencing of hay storage & feeding yards on 95% of farms in proximity to deer and elk habitat.
<p>England</p>	<p>Within England the Department for Environment, Food and Rural Affairs has the lead responsibility for the eradication and control of Bovine TB. Recent years have seen a considerable growth in Bovine TB infections in high risk areas such as the South West of England and as a result Defra has publicly stated that it will ‘<i>take decades to eradicate the disease</i>’ within England.</p> <p>The approach adopted in The Bovine TB Eradication Programme for England³² published in 2011 has a number of key principles as follows:</p> <ul style="list-style-type: none"> • Partnership working - recognising the progress and continuing to develop working between government, the industry and veterinary science; • Responsibility and cost-sharing - giving farmers more control and choice, empowering the industry to take greater responsibility for tackling TB; • Working effectively in the EU: ensuring compliance EU legislation, while pushing for a more flexible, risk-based EU legal framework; • Supporting farmers - reducing unnecessary burdens and restrictions on farmers where possible and without compromising disease controls. Also, working with the industry and veterinary profession to provide targeted advice and support to farmers. <p>In terms of practical actions to eradicate Bovine TB within England these could be characterised as being either surveillance or control measures and those that have been in use for a number of years include the following:</p> <ul style="list-style-type: none"> • A significant expansion of the areas on annual and two-yearly routine testing - routine testing is risk based in England – herds in higher risk areas are testing on an annual basis, whereas herds in lower risk areas

³¹ [Canada’s Bovine Tuberculosis Eradication Program, Powerpoint presentation by Dr.Connie Argue and Dr.Maria Koller-- Jones, Canadian Food Inspection Agency, July 2009](#)

³² [Bovine TB Eradication Programme for England , Defra, July 2011](#)

	<p>are tested every second, third or fourth year.</p> <ul style="list-style-type: none"> • Enhanced controls on some high risk herds; • Clarifying TB breakdown terminology so farmers better understand disease risk; • Enhanced surveillance for TB at abattoirs; • Extended the use of gamma interferon blood testing to infected herds in two-year routine testing areas; • Reviewed and confirmed the effectiveness of the pre-movement testing policy; and • DNA tagging of TB positive cattle from April 2011 – to prevent fraud. <p>The 2011 Eradication Plan also contains the following new proposals:</p> <ul style="list-style-type: none"> • Revising some of the existing pre-movement testing exemptions; • Reducing compensation payments for reactor animals from herds where TB tests are significantly overdue; • Reviewing options for an enhanced risk-based approach to routine TB surveillance; • Reviewing the procedures for TB infected herds regaining OTF status; • Assessing the feasibility of options for a risk-based trading system; • Developing a more rigorous, risk-based TB compliance and enforcement strategy; and • Continuing to invest in the development of a cattle vaccine and seek to persuade the EU to lift the current ban on TB vaccination of cattle. <p>Defra strategy also recognises the need for steps to reduce the threat of TB infection posed by the badger population and with this in mind work continues in the following ways:</p> <ul style="list-style-type: none"> • 2010 public consultation on a proposal to enable the issuing of licences under the Protection of Badgers Act 1992 and the Wildlife and Countryside Act 1981 to farmers and/or landowners to cull and/or vaccinate badgers for the purpose of preventing the spread of bovine TB in cattle – government recently completed a second round of consultation before deciding whether or not to proceed with a cull; • invested over £11 million on research into badger vaccines -as a result an injectable BCG badger vaccine is now available for use on prescription, subject to a licence from Natural England; • badger vaccine deployment project - During the first trapping year more than 500 badgers were vaccinated in the 100km² pilot project area in Gloucestershire; • developing an oral badger vaccine, which, if it can be done, has the potential to make an important contribution to reducing infection levels in badgers, and as a result, badger to cattle transmission.
Ireland	<p>A scheme for the eradication of bovine tuberculosis in cattle commenced in Ireland in 1954 with a voluntary scheme for the eradication of bovine tuberculosis in cattle commenced initially in counties Sligo and Clare. The scheme was gradually extended to other areas and intensified from 1958 onwards, and was given a statutory basis Diseases of Animals (Bovine Tuberculosis) Act, 1957 and included measures for the</p> <ul style="list-style-type: none"> • provision for the identification and declaration of areas in which bovine tuberculosis is to be eradicated; • testing in those areas; • removal and slaughter of reactors; and • provision of compensation to farmers. <p>In April 1988, a new initiative, ERAD, the Eradication of Animal Disease Board, was established by the Irish Government as a specialised agency to implement a vigorous four-year TB eradication programme and implemented the following</p>

	<p>measures:</p> <ul style="list-style-type: none"> • pre-movement testing; • a comprehensive testing programme using a more potent tuberculin (30,000 I.U./ml); and • a more severe interpretation than that required by Directive 64/432/EEC, both at individual herd, including full herd depopulation, and at area based level. <p>The period of 1988-1992 also saw the first connections between badgers and Bovine TB and this led to the development of an interim wildlife control strategy where badger capturing and removal took place in areas associated with bovine herd TB breakdowns.</p> <p>From 1992 to the present measures that have been employed to eradicate Bovine TB have included³³:</p> <ul style="list-style-type: none"> • an annual round screening test of all herds (farmers pay for routine surveillance tests themselves – government pays in instances of outbreak); • controls on movement of animals; • restriction of holdings; • removal and slaughter of reactors and specific targeted testing including the use of blood tests, with appropriate follow-up testing; • compensation for farmers whose herds are affected by disease; • a focused badger population control where they have been implicated as a probable cause of TB; and • continued work towards the development and introduction of a vaccine to prevent TB in badgers.
New Zealand	<p>The TB control programme in New Zealand is guided by the National Pest Management Strategy for Bovine TB³⁴ (NPMS). It is managed by the Animal Health Board under the programme name "TB free New Zealand. Between 2009 and 2010 the programme has witnessed a 25% decrease in Bovine TB incidence.</p> <p>Contact with infected wildlife remains the main source of the disease for domestic cattle and deer herds. While possums are the main carrier of the disease in the wild, ferrets are also a common infection source in some areas. These infected wild animals are known as TB vectors and the areas they inhabit are classified as vector risk areas (VRAs).</p> <p>Control and eradication methods employed to deal with Bovine TB are as follows:</p> <ul style="list-style-type: none"> • disease control - aiming to control and contain the spread of the disease within cattle and deer herds – primarily achieved through a regular testing programme and associated classification/register of herd status; • movement control - controlling the spread of the disease between herds - AHB has developed Movement Control Areas (MCAs) in which certain movement restrictions apply. Cattle or deer over 90 days old and inside an MCA must have a pre-movement test within 60 days prior to being moved. Stock going direct to slaughter do not need a pre-movement test ; • vector control - aiming to control and contain the wild animal species mostly responsible for spreading the disease to cattle and deer – include surveys of wild animal populations are undertaken to determine the presence and/or extent of infected wildlife, ground and aerial baiting with poison and trapping to remove infected wildlife;

³³ [2011 TB Control Programme, Department of Agriculture, Fisheries and Food, DAFF website](#)

³⁴ [National Operational Plan: 1 July 2005-30 June 2013, National Bovine Tuberculosis Pest Management Strategy, Animal Health Board, New Zealand.](#)

	<p>New Zealand is also proactively involved in the development of a BCG vaccination for cattle which would afford immunity but not result in a positive skin test for TB in vaccinated cattle³⁵.</p>
Scotland	<p>As such no TB eradication plan exists due to TB free status. Control measures are however set out in the Implementation Plan for Officially Tuberculosis Free Status in Scotland³⁶.</p> <p>These include legal requirement for cattle over 42 days old that move from 1 or 2 yearly testing parishes into a Scottish herd to have Pre & Post movement tests. The Pre-movement test must occur within 60 days prior to entering a Scottish herd, and the post-movement test between 60-120 days of their arrival. All pre and post movement tests must be arranged and paid for by the herd owner. Other measures are as follows:</p> <ul style="list-style-type: none"> • With effect from 28 February 2010, a clear TB test prior to movement to Scotland is also required for cattle from all low incidence areas of England and Wales (3 and 4 yearly tested parishes) no more than 60 days before movement and no less than 60 days after any previous test with the following exceptions: <ul style="list-style-type: none"> ❖ Cattle which can be shown to have spent their whole lives in low incidence areas; ❖ Cattle being sent direct to Scotland for slaughter; ❖ Calves less than 42 days of age. • bTB Isolation units in Scotland which permit Irish imports to be exempt from post import testing will be phased out by the end of December 2010, and importers will be required to meet the cost of post import testing (as for movements from high incidence areas in GB); • The current requirement for pre- and post-movement testing of cattle from 1 and 2 yearly tested parishes in England and Wales to Scotland. • Pre-export tuberculin testing of cattle over 42 days of age. (To be reviewed annually) • Enforcement of compliance through cross checks using existing and new cattle movement reports from BCMS and routine checks by animal health staff. • Abattoir surveillance through meat inspection. • TB is a notifiable disease and suspect cases should be reported • Source and spread tracings of breakdowns. • Gamma interferon testing for all new confirmed breakdowns in Scotland • Routine tuberculin testing will continue during the transitional period with a four yearly default testing frequency period - The proposed future approach is : <ul style="list-style-type: none"> ❖ Risk analysis to establish criteria for at-risk herds; ❖ Consideration of whole herd tests vs. selected animal tests; ❖ Consideration of ceasing routine testing on islands with low disease risk.
USA	<p>In 2000, a comprehensive Strategic Plan for the Eradication of Bovine Tuberculosis was announced in conjunction with an emergency declaration by the Secretary of Agriculture. A goal of final eradication was set for the end of 2003 but has not been achieved, although 46 states have reached this status.³⁷</p>

³⁵ [Annual Report for the year ending 30th June 2010, Animal Health Board of New Zealand](#)

³⁶ [the Implementation Plan for Officially Tuberculosis Free Status in Scotland, Scottish Government Website, 22nd September 2011](#)

³⁷ http://www.aphis.usda.gov/publications/animal_health/content/printable_version/AHR_Web_PDF/E_chapter_3.pdf

Under the most recent programme States, zones, or regions are classified into five categories based on prevalence of TB in cattle and bison as follows³⁸:

- Accredited-free - herd prevalence of zero for bovine tuberculosis in cattle and bison;
- Modified Accredited Advanced - must have had a bovine tuberculosis prevalence of less than 0.01% of the total number of cattle and bison herds in the State or zone for each of the most recent 2 years;
- Modified Accredited - must have had a tuberculosis prevalence of less than 0.1% of the total number of cattle and bison herds in the State or zone for the most recent year ;
- Accreditation Preparatory - have a tuberculosis prevalence of less than 0.5% of the total number of cattle and bison herds in the State or zone ; and
- Non-Accredited - have an unknown tuberculosis-affected herd prevalence or a tuberculosis herd prevalence of 0.5% or greater.

The state status determines the interstate and intrastate TB testing requirements for cattle. The classification system ensures that the state meets the requirements necessary for obtaining national eradication of bovine TB.

In terms of eradication and control measures the approach adopted within the USA is characterised as being based upon detection and removal. Detection of the disease is achieved by:

- Live Animal Surveillance - herds are subjected to skin tests; and
- Routine Slaughter Surveillance - cattle slaughtered at state and federally inspected slaughter plants are inspected for granuloma lesions. Suspect lesions undergo laboratory diagnostics to confirm presence of *M. bovis*.

In instances of detection the following steps are followed³⁹:

- a herd is confirmed as infected by laboratory testing,
- the herd is classified as an affected herd and placed under quarantine and TB tested to determine the presence or absence of other infected animals.
- epidemiological tracing of cattle movement into and from the affected herd is performed and additional contact herd testing is conducted.
- owners of affected herds may either depopulate the affected herd or engage in a test and removal plan.
- In a test and removal plan cattle are repeatedly tested. Infected and suspect cattle at each test are removed to slaughter until the remaining herd tests negative for the disease. This process will take 4-7 years to attain a required series of negative herd tests.

Following on from an October 2009 APHIS published entitled "A New Approach for Managing Bovine Tuberculosis" the following moves were instigated in 2010⁴⁰:

- **New Policy for Management of TB-Affected Herds** - Historically, Federal funding was used to depopulate entire TB-affected herds and indemnify herd owners as the primary management option. Rather than recommending whole-herd depopulation, APHIS now tailors its approach to a particular herd. In simple terms this means that a test and remove

³⁸ [Bovine Tuberculosis Eradication, Uniform Methods and Rules, Effective January 1, 2005, United States Department of Agriculture](#)

³⁹ [Bovine Tuberculosis, Information for Livestock Producers, Animal Health and Food Safety Services, Animal Health Branch, California Department of Food and Agriculture, 2011](#)

⁴⁰ [Chapter 3 – Animal Disease Surveillance and Management, 2010 United States Animal Health Report, United States Department of Agriculture](#)

	<p>approach can now be employed in circumstances where data supports it;</p> <ul style="list-style-type: none"> • Joint TB and Brucellosis Regulatory Working Group - In September 2010 APHIS formed a working group of Federal, State, and tribal subject matter experts to discuss new directions for the bovine tuberculosis (TB) and brucellosis eradication programs. Development of the proposed TB and brucellosis regulation was expected to take approximately 2 years and work is ongoing on this front; • TB Serum Bank - he serum bank provides well-characterized serum samples with skin test results for samples from uninfected animals and skin test, histopathology, and TB culture results for samples from infected animals. The serum bank samples will be available to researchers and diagnostic companies as they develop and evaluate serologic tests for bovine TB using the criteria recommended by the United States Animal Health Association; • Collaborations with Mexico – APHIS continues to work with Mexico animal health authorities to help advance the country’s TB eradication program and to significantly reduce the risk of importing TB-infected and -exposed animals into the United States.
Wales	<p>The Welsh Assembly Government developed a TB Eradication Programme for Wales in 2008 which was overseen by the TB Eradication Programme Board, a Technical Advisory Group and the Welfare Strategy Steering Committee. The Programme had the following objectives:</p> <ul style="list-style-type: none"> • keeping infection out of clean farms and clean areas by raising standards of biosecurity; • rapid, early identification of infection; • containment of infection through immediate imposition of movement restrictions once disease is suspected and actively tracing potentially infected cattle; • elimination and eradication of infection from infected herds and • infected areas <p>Key elements of this programme included:</p> <ul style="list-style-type: none"> • TB Health Check Wales – every cattle herd in Wales tested to establish a baseline for the disease; • Biosecurity measures – including improved animal husbandry; • Pre movement testing and new testing measures; • Compensation scheme; • Culling of badgers within an Intensive Action Pilot Area (IAA); • Development of badger and cattle vaccines. <p>2008 also saw the creation of 3 Regional Eradication Delivery Boards in Wales, covering North Wales, Carmarthen and Cardiff. These Regional Boards are tasked with controlling and eradicating Bovine TB taking account of what works best within their region⁴¹.</p> <p>Since 2010 the eradication of TB in Wales has been an integral part of the UK TB Eradication Plan as set out previously in this table relating to England. It is also worth noting that since January 2010 all herds of cattle in Wales are annually tested for TB.</p>

⁴¹ [Regional Eradication Delivery Boards page, Welsh Government Website, 14th October 2011](#)

	<p>The Badger (Control Area) (Wales) Order 2011⁴² provided the legislative means for a badger cull within Wales as well as establishing a control area (IAA) mainly covering Pembrokeshire and small parts of Carmarthenshire and Ceredigion. As of today however no badger cull has been instigated within this control area.</p> <p>On 21 June 2011, Welsh Minister for Environment and Sustainable Development John Griffiths announced that there will be a review of the scientific evidence base regarding the eradication of bovine TB in Wales. These experts will peer review the scientific evidence base for the comprehensive programme for the eradication of bovine TB in Wales. The panel will be chaired by an independent expert with the other members being relevant recognised experts. It is expected that the report will be delivered in November 2011.</p>
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Table 4: Bovine TB eradication and control measures - selected countries

⁴² [The Badger \(Control Area\) \(Wales\) Order 2011](#)