

**An Integrated Eradication Programme**

## **Bovine Tuberculosis Eradication Strategy for Northern Ireland**



**The TB Strategic Partnership Group**

**2016**

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## Chairman's Note

Very few animal diseases have managed to attract the attention, inflame the passion and court the controversy that bovine Tuberculosis (bTB) has, particularly in recent times.

Bovine Tuberculosis is a chronic disease in cattle caused by a bacterium called *Mycobacterium bovis*, (*M. bovis*) which is closely related to the bacterium that causes human tuberculosis (*M. tuberculosis*) with both organisms being part of the tuberculosis complex group.

This disease has affected cattle in countries across the globe, and the battle to defeat it has enjoyed varying degrees of success from those where it has been eradicated, like Australia, to others closer to home, where the battle continues.

When the TB Strategic Partnership Group (TBSPG) was formed in 2014, I was delighted to be working with respected scientists Dr. George McIlroy and Dr. Cecil McMurray C.B.E, and industry leaders John Thompson and Campbell Tweed O.B.E. George and Cecil have many years experience in the veterinary and scientific fields. They have provided the Group with the essential technical knowledge and have also undertaken a challenge function. John and Campbell have personal and professional experience of bTB within their own herds, and have brought invaluable experience and expertise to our discussions, our planning and the formulation of the long term Strategy to eradicate bTB in Northern Ireland that we bring forward now.

Our work over the last two years has been facilitated by two Department of Agriculture, Environment and Rural Affairs (DAERA) staff: the Chief Veterinary Officer (CVO) and Director of Animal Health and Welfare Policy Division, who attended meetings as ex-officio members. A Secretariat was also provided by DAERA. We are extremely grateful for the sources of expertise from the Department, in particular epidemiological and veterinary, that we were able to access as we worked towards our goal.

As a Group, we had the opportunity to meet with representatives of those who have a stake in the eradication of this disease and in the promotion of healthy bovine and wildlife populations. We took the opportunity to garner a full range of opinions, and it was clear to us from the outset that, while there was a general desire to eradicate bTB, there was a variety of (often strongly held) views on how this could be achieved. It was also clear that any successful eradication strategy would need to contain a comprehensive and interlinked programme of measures and that successful implementation would require compromise from all those with an interest in defeating this disease.

What we present now is based on the outcome of our early engagements, our Interim Report in 2015, consultation on that Report, a multitude of meetings with interested individuals, groups and representative bodies, the consideration of countless scientific papers, and our deliberations with colleagues across jurisdictional boundaries.



Implementing this bTB Eradication Strategy and Implementation Plan will take courage, compromise and the support of farmers and nature conservationists, together with on-going scientific research and political backing.

This Strategy is intended to set us on a decreasing trajectory - and over the next 3 or 4 decades see the disease finally eradicated from NI.

Working together – we believe that this is certainly achievable!

Sean Hogan

A handwritten signature in black ink, appearing to read 'Sean Hogan', with a long horizontal line underneath.

*Chairman*

TB Strategic Partnership Group

# A New Approach

## TBSPG

On 17 September 2013, the then Agriculture and Rural Development Minister Michelle O'Neill MLA, announced to the Northern Ireland (NI) Assembly Agriculture and Rural Development (ARD) Committee her intention to establish a Government / industry partnership to develop a long-term strategy to eradicate bovine Tuberculosis (bTB) from the cattle population in NI. The TB Strategic Partnership Group (TBSPG) was established in 2014 and formed an important part of the NI Executive response to Going for Growth (2013 Report)<sup>1</sup> which recommended that Government strengthen brand perception through eradication of diseases and called for a joint Government / industry working group to agree a strategy to deliver a significant reduction in (and ultimately the eradication of) bTB.

Our role is to provide the current Minister for Agriculture, Environment and Rural Affairs, Michelle McIlveen MLA, with a Strategy and an Implementation Plan to effect a progressive and sustained reduction in both the levels of disease and the cost of the bTB eradication programme; improve detection of disease; encourage better biosecurity; reduce disease risks throughout the cattle industry; and find cost-effective ways to eradicate the disease.



TBSPG members in session (from left to right), Dr. George McIlroy, Sean Hogan (chair), Dr. Cecil McMurray C.B.E, John Thompson and Campbell Tweed O.B.E.

After our establishment we conducted an initial consultation in January 2015 which, along with comprehensive evidence gathering, formed the basis of our Interim Report, which was published on 30 June 2015 and is available via the DAERA website.<sup>2</sup>

We have met with representative bodies, experts, scientists, nature conservationists, veterinarians and those operating at the coal face from across the United Kingdom (UK) and the Republic of Ireland (RoI). We have spoken to international experts dealing with bTB in other countries and have considered a huge amount of information.



Having assessed the responses to the Interim Report consultation, (see Annex 2 for a summary of the consultation responses), and the other evidence gathered, we employed the services of independent consultants to evaluate our recommendations from a cost/benefit and behavioural perspective. In addition, Drs. McMurray and McIlroy undertook a scientific analysis to both validate the recommendations in the Strategy and consider their impact on disease trends. Their work was peer reviewed by an independent academic. Details of these analyses are available on the DAERA website and are listed at Annex 3.<sup>3</sup>

Given the complexity of the disease, and the multitude of factors which impact on it, we focussed on what, in our opinion, are the key factors which cause disease spread. Our recommendations reflect this approach.

International experience has shown that the eradication of bTB can only be achieved by simultaneously addressing all the factors that meaningfully contribute to the persistence and spread

of the disease in infected animal populations. We consider that the recommendations we make in this Strategy represent a complete package of actions which would lead not only to disease eradication in the cattle population but also contribute to the health of the badger population.

At the outset, we want to acknowledge that we fully recognise that any action relating to the removal of badgers would be both emotive and controversial. We equally recognise that, in NI, badgers are the main wildlife reservoir of bTB infection and our Strategy must address the issue. In making our recommendations we have sought to balance the available evidence and in doing so we are confident that these recommendations would contribute to the reduction and eventual eradication of the disease in cattle.

There is no single solution or quick fix, indeed some of the measures recommended may initially result in a rise in bTB detection as a result of tighter controls and increased testing. This is a long term Strategy designed to achieve a sustained reduction and eventual eradication of bTB cattle and will require both a change of attitude and intense effort by all involved over the years ahead if we are to achieve our ambition.

Implementing the package of recommendations will present challenges, but it is achievable. We believe that this Strategy provides a vital opportunity to put in place innovative actions and a new enhanced programme to effectively deal with bTB. Like any strategy, it must be responsive and adaptable to new evidence as it becomes available.



***Our aim is to eliminate bTB in cattle and contribute to the health of the badger population.***

We would urge all readers to consider our recommendations as a package of measures. We believe that the key to success of the Strategy will be our ability to work together, with understanding, commitment and willingness from **all**. As the European Commission commented in its 2013 Working Document on Eradication of bTB in the European Union (EU) which was accepted by the bTB Task Force<sup>4</sup>:

*“It is essential that all stakeholders involved in the eradication programme, independent of their respective roles and responsibilities, actively commit and contribute to the full implementation of all the measures of the programme.”*

This was again highlighted by the European Commission Food and Veterinary Office (FVO) following its audit of the NI bTB Eradication Programme in June 2015.

Our Report is arranged in 3 sections:

**Section A** provides information and details on what is currently happening to deal with bTB;

**Section B** outlines our recommendations to control, reduce and eradicate the disease which are arranged by chapter under 7 thematic headings; and

**Section C** provides a table showing our key recommendations and gives an indication of when we think these should happen.

We have identified 38 recommendations across the 7 themes.

This document represents a high level overview of our recommendations and approach. Papers showing our background thinking and the evidence which we considered are listed at Annex 3 and are available online at [www.daera-ni.gov.uk/tbsp-g-btb-eradication-strategy-ni](http://www.daera-ni.gov.uk/tbsp-g-btb-eradication-strategy-ni).



# Context

## The importance of the agricultural sector to NI

NI covers an area of 14,130 km<sup>2</sup>, of which 46.4% (6,560 km<sup>2</sup>) is rural.<sup>5</sup> Farming and agriculture are core components of NI's economy and society, contributing £351m to the NI Gross Value Added (GVA) (a measure of economic activity), and to the direct employment of approximately 26,000 persons (representing 3.2% of total employment in NI).

There are almost 25,000 farms in NI, with the average size being 40 hectares. 88% of those farms are providers of dairy products, sheep and/or beef. The June 2015 Agricultural Census<sup>6</sup> showed that there were around 1,609,000 cattle in NI, with an average herd size of 79 animals. In 2015, the beef industry accounted for 15,090 farms (260,325 cows) and the dairy industry had 3,537 farms (311,520 cows), the average sizes of beef and dairy farms being 17.3 and 88.1 cattle respectively.

In 2015 the output of the sector was estimated at £393.8m for the beef sector (excluding the value of imported animals) and £479.9m for the dairy sector.<sup>7</sup>

The importance of the sector to the NI economy is widely recognised. The Agri-Food Strategy Board (the industry/Government Board set up by the NI Executive to develop a strategic action plan for the sector) noted in its 2013 Report - 'Going for Growth – Investing in Success':

*“agri-food is our most successful industry. It is now a major industry driving the local economy and contributing substantially to every area of NI. Many of our biggest and most successful businesses are driving growth through sales outside NI and helping to create employment throughout the region.”<sup>1</sup>*

The Agri-Food Strategy Board published an update on the sector's performance in March 2016<sup>8</sup>, which includes performance statistics for 2014. These are summarised in Table 1.

**Table 1:** Size and Performance of the NI Food and Drinks Processing Sector (2014).<sup>9</sup>

Indicators	
<b>Overall Value of Food and Drinks Processing Sector (2014)</b>	<b>Turnover:</b> £4.544m <b>GVA:</b> £721m <b>Employees:</b> 20,758 <b>External Sales</b> (outside NI): £3.299m <b>Export Sales</b> (outside UK): £1.289m
<b>Value of Beef and Sheepmeat (Food Processing) to NI economy (2014)</b>	<b>Turnover:</b> £1.244m <b>GVA:</b> £134m <b>Employees:</b> 4,550 (FTEs) <b>External Sales</b> (outside NI): £1,023.1m <b>Export Sales</b> (outside UK): £240.6m
<b>Value of Dairy Products (2014)</b>	<b>Turnover:</b> £994m <b>GVA:</b> £80.7m <b>Employees:</b> 2,135 <b>External Sales</b> (outside NI): £673.8m <b>Export Sales</b> (outside UK): £457.2m
<b>Value of live cattle and live sheep exports (2014)</b>	<b>Export Sales</b> (outside UK): £41.1m
<b>Combined total value of exports of beef and sheepmeat, dairy products and live cattle and sheep (2014)</b>	<b>Export Sales</b> (outside UK): £738.9m

Furthermore, bTB eradication is recommended within the Going for Growth Strategic Action Plan, highlighting the need to ‘strengthen our brand perception through eradication of animal disease such as bTB’ to improve international market share.

The agri-food sector in NI is much more important to the local economy than is the case in other parts of the UK. There is also movement of products between here and the RoI (for example 29% of raw milk produced on our farms is processed there). These are relevant considerations when new trading arrangements with the EU and other countries are negotiated following the UK's decision in June 2016 to leave the EU (commonly referred to as Brexit). The need to strengthen our brand through eradication of animal diseases such as bTB has never been more important.

We have taken account of these issues in developing our Strategy and Implementation Plan for the eradication of bTB in cattle in NI.

# Introduction

## Section A

### What is bovine Tuberculosis?

Bovine Tuberculosis (bTB) is a chronic disease in animals caused by a bacterium called *Mycobacterium bovis* (M. bovis), which is closely related to the main bacterium that causes TB in humans. Although cattle are the main hosts of M. bovis, the disease has been reported in many other farmed and wild animals. There have also been reported cases in humans.

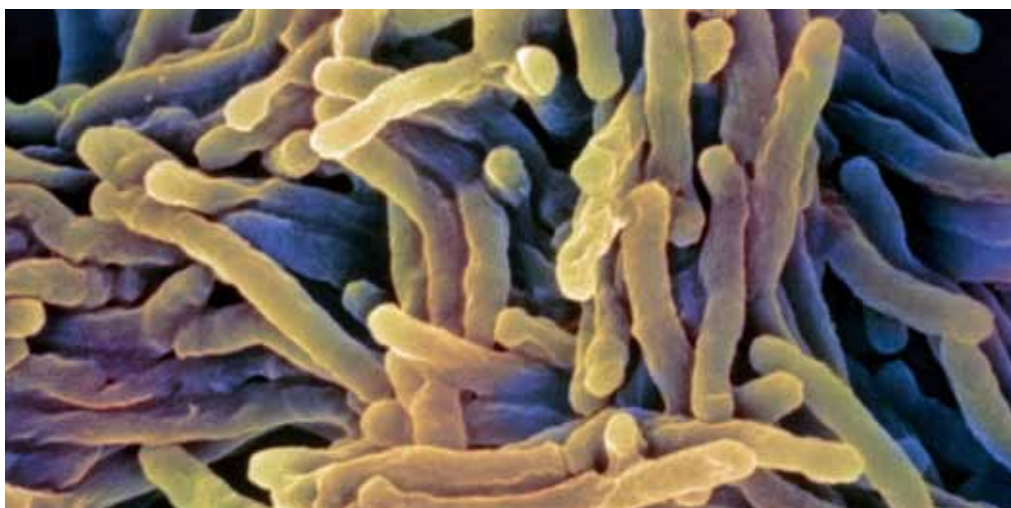


Image courtesy of: A. Dowsett, Public Health England/Science Photo Library.

**Figure 1** - Our focus the M. bovis bacteria magnified over 1 million times.

The disease is contagious and is spread mainly by contact with infected animals. The most common route of transmission is via the respiratory system, where a previously healthy animal becomes infected through inhaling droplets expelled from the lungs of another infected animal. Drinking unpasteurised milk from infected cows can also lead to infection of calves and humans.

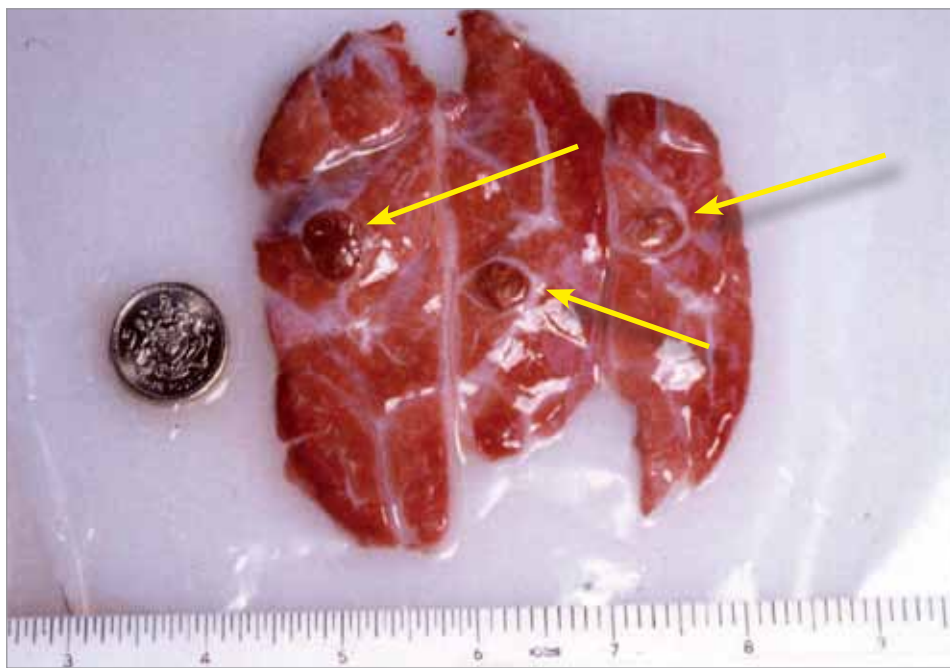
The spread of bTB involves complex interactions between animals of the same and different species and between animals and the environment. Infection can be spread:

- within a herd through contact with infected cattle;
- by movements within herds;
- through direct or indirect contact with infected wildlife;
- from herd to herd by cattle movement between herds; and
- from cattle to cattle contact across boundaries.

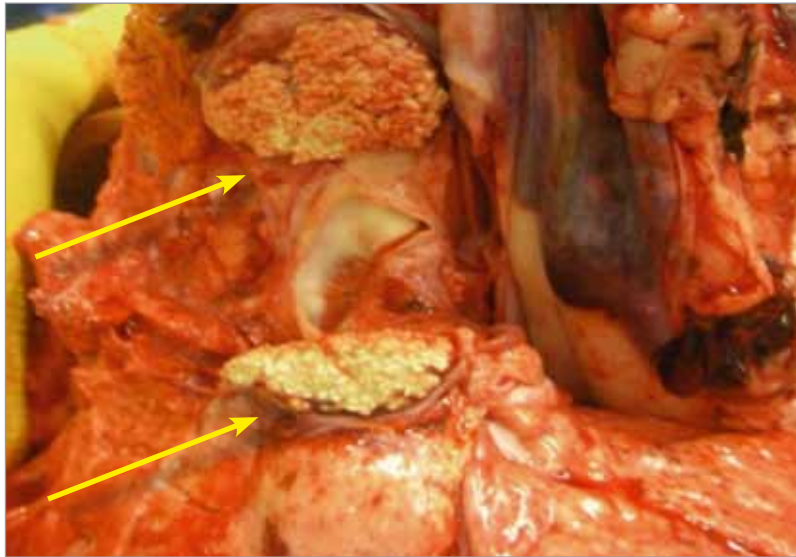
Risk factors most commonly associated with bTB breakdowns in NI include recent history of bTB on the farm, herd size, high levels of bTB in the area (particularly on neighbouring or adjoining farms), purchasing of cattle and the observed presence of badgers, badger activity or badger setts within the farm boundary.<sup>10,11,12,13,14</sup>

The development of the disease is slow, with infected animals showing no symptoms until some considerable time after they are infected. This means that an infected animal can spread bTB to many other contacts before it has begun to show any visible signs of the disease itself. Indeed, with the current frequency of tests, it is unusual to see visible signs of infection in cattle.

Diagnosis of bTB is extremely challenging. There is currently no single test that will identify all infected animals. Even at post mortem it can be difficult to detect bTB lesions (small abnormalities), which often means that truly infected animals do not show visible lesions and farmers can mistakenly think the reactor animal (that is an animal which tested positive for bTB at a skin test) was not infected and, therefore, did not need to be removed.



**Figure 2** - 3 separate sections of lung showing small *M. bovis* lesions alongside a £1 coin. Small lesions such as these, when buried deep in tissues, are highly unlikely to be detected on post mortem inspection.



*Image courtesy of: DAERA*

**Figure 3** – Gross M.bovis lesions which would be readily seen on post mortem inspection. Lesions vary greatly in both form and location in the carcass.

## Current Programme

In NI, the Department of Agriculture, Environment and Rural Affairs (DAERA) delivers the bTB EU approved Eradication Programme and develops the policy behind it.

The key components of the Eradication Programme are:

**Disease surveillance** – abattoir surveillance through post mortem inspection of all slaughtered animals and individual live animal surveillance, at least annually, using the single intradermal comparative cervical skin test (SICCT) augmented by the gamma interferon blood test (IFNG).

**Removal of reactor animals** – animals that react positively to the skin test are compulsorily removed to slaughter with compensation paid at full market value to the herd keeper.

**Veterinary Risk Assessment** – assessment of risk of bTB infection in the herd and application of appropriate disease control measures, as soon as disease is suspected, to prevent further spread. Follow up investigations are conducted to indicate where disease may have come from, or spread to. At risk herds and animals are also subject to additional testing and controls.

Full details of the current EU approved Eradication Programme are available on the European Commission website.<sup>15</sup>

During the course of our considerations we worked closely with DAERA on the introduction of enhancements to the current programme, that are intended to improve the detection of disease. These have included changes to the way in which the gamma interferon test is



deployed leading to more targeted use as well as increased laboratory capacity to allow more samples to be submitted. In addition DAERA introduced a new contract for the provision of bTB testing and associated services by Private Veterinary Practices in 2016. This put the delivery of bTB testing onto a more business like footing which allows the quality of delivery to be better assessed and managed so addressing a recommendation made by the Public Accounts Committee (PAC) in 2009 for the Department to ensure its supervision of Private Veterinary Practitioners (PVPs) becomes more effective.

## Trade

The EU approved bTB Eradication Programme provides an essential underpinning to NI's ability to trade internationally and contributes to the commercial success of NI's export dependent agri-food sector (which as a whole is estimated to be worth £1.351 billion per year in sales outside the UK).

Current EU rules mean that a herd must be certified free from bTB before live animals can be exported. Similar rules apply for trade in live animals within NI and between NI and the rest of the UK.

Trade in animal products is also affected by bTB status. Milk from any reactor animals, that is animals which have tested positive for bTB at a skin test, must be excluded from the food chain, with the milk from the rest of the herd being appropriately heat treated. Meat for export must be certified by an official veterinarian to say it is from animals that have been examined and found to be free from generalised disease, fit for human consumption and compliant with specific additional rules related to bTB.

Whilst the impact of Brexit is not yet known, as negotiations have yet to take place, we consider that leaving the EU is unlikely to mean any reduction in bTB controls if we want to continue to trade. That is because in order for a third country to trade into the EU, they must demonstrate that their controls are at least equivalent to those in the EU. Other EU Member States are fully aware of our current bTB position and maintaining our trading links may be challenging if we are not seen to be making significant progress to reduce the incidence of bTB within our herds.

**REGULATION (EC) No 178/2002 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL** of 28 January 2002 laying down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety.

### **GENERAL OBLIGATIONS OF FOOD TRADE** *Article 11*

Food and feed imported into the Community for placing on the market within the Community shall comply with the relevant requirements of food law or conditions recognised by the Community to be at least equivalent thereto or, where a specific agreement exists between the Community and the exporting country, with requirements contained therein.

For trade outside the EU, the World Animal Health Organisation (OIE) recommends controls at least equivalent to EU requirements.

We cannot afford to be complacent and we must be alert to global competition and consumer preference which demands ever increasing standards of livestock husbandry and food production. Failure to do so places NI's ability to trade in jeopardy.

In order to be recognised as "Officially bTB Free" (OTF) NI would need to demonstrate that the percentage of cattle herds confirmed as infected with bTB has not exceeded 0.1% per year of all herds for 6 consecutive years and at least 99.9% of herds are officially bTB free each year for 6 consecutive years.

After achieving OTF status, some form of surveillance would still be required but it would be much reduced compared to today's levels.

#### **OIE Article 11.5.5.**

#### **Recommendations for the importation of cattle, water buffaloes and wood bison for breeding or rearing.**

*Veterinary Authorities of importing countries* should require the presentation of an *international veterinary certificate* attesting that the *animals*:

1. showed no sign of bovine tuberculosis on the day of shipment;
2. originate from a *herd* free from bovine tuberculosis that is in a country, *zone* or *compartment* free from bovine tuberculosis; or
3. were subjected to the tuberculin test for bovine tuberculosis with negative results during the 30 days prior to shipment and come from a *herd* free from bovine tuberculosis; or
4. have been isolated for at least 90 days prior to entry into the *herd* including protection from contact with wildlife reservoirs of bovine tuberculosis and were subjected to at least two tuberculin tests carried out at a six-month interval with negative results with the second tuberculin test performed during the 30 days prior to entry into the *herd*.

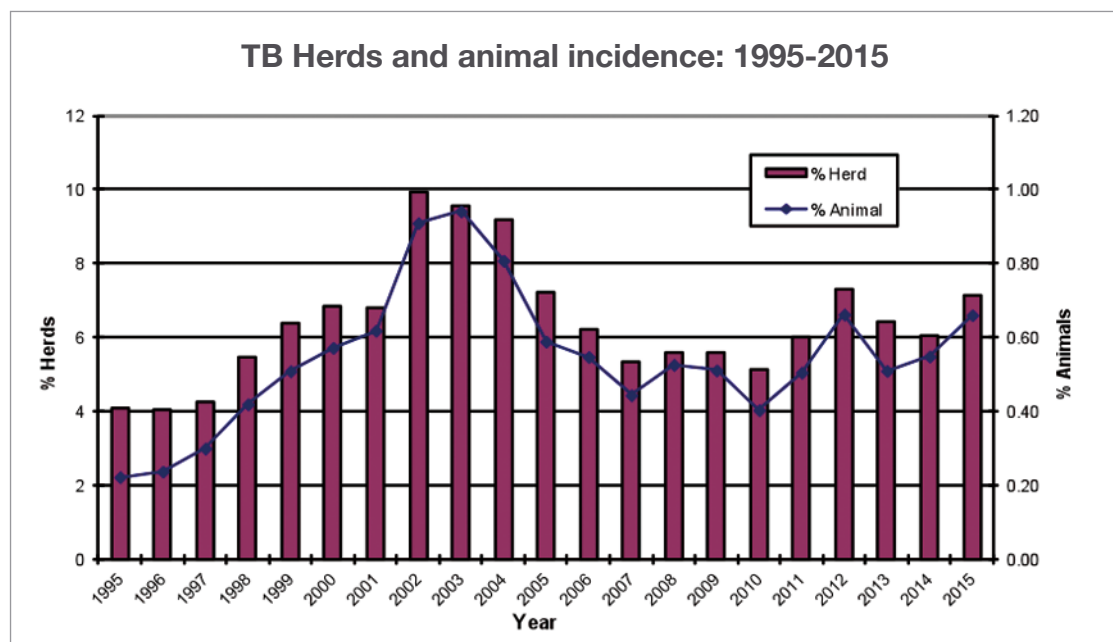
## **Impact of current control programme**

Efforts to eradicate bTB from the NI cattle herd were initially driven by public health concerns and the desire to increase the productivity and welfare of the national cattle herd.

A period in the late 1990s saw, as a trend, a steady increase in herd incidence to a peak of 10.21% in February 2003. This peak came after the Foot and Mouth Disease outbreak in 2001 when on-farm testing was suspended for around 4 months and it took an extended period to clear the backlog of testing.

Following this, a steady downward trend in herd incidence was seen until 2007. Herd incidence remained reasonably level until August 2011 when it reduced to 4.99%. From then, there was been a general rising trend peaking at 7.46% in late 2012, before starting to decline to reach 5.95% in September 2014. From that point disease levels have risen and the current herd incidence rate (at 30th September 2016) is 7.12%.

**Table 2** below shows the historical movement of bTB herd and animal incidence over the period from 1995 to 2015.



It is important to note that across NI at any one time more than 90% of herds are OTF and this is of course very welcome. Those that are not OTF have had their status removed for disease reasons or for other programme related reasons, such as failure to test on time.

The annual expenditure on the bTB Eradication Programme during the last 3 years has been in excess of £27 million per year. In addition to the cost to Government, farmers also suffer consequential losses, with additional costs to the farming industry estimated by the Ulster Farmers Union (UFU) to be around £10 million per year.

But the impact of bTB is not just financial; the stress and frustration of testing for the farmer is well documented and indeed has been consistently relayed to us in the course of our engagements. No farmer wants to lose cattle, and in some cases breeding lines that they have built up over generations.

## Why has bTB not been eradicated?

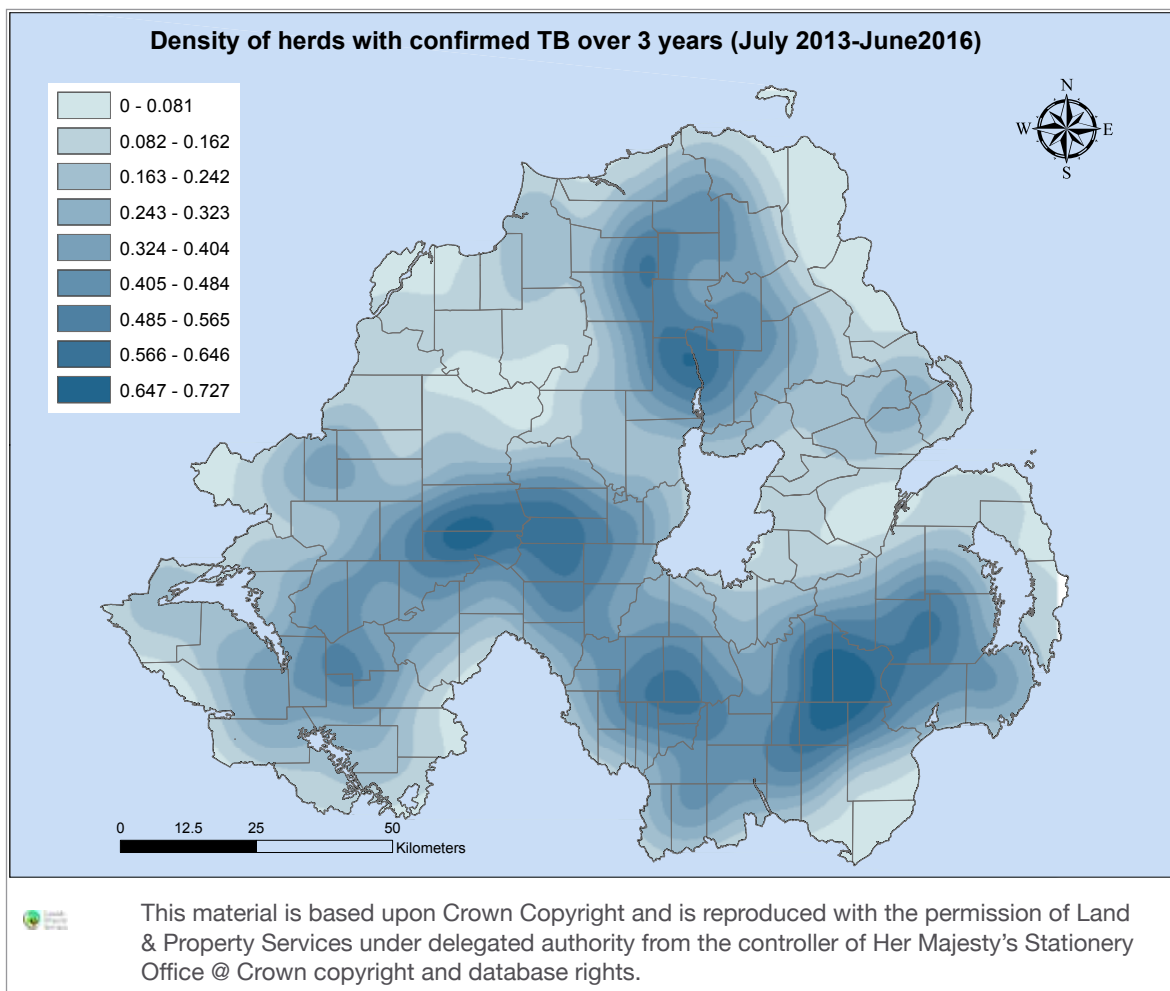
While TB in humans is being tackled through a vaccination programme, there is currently no vaccine approved for use in cattle, nor is there likely to be one available in the near future. The focus of the DAERA bTB Eradication Programme has been to remove the disease by;

- identifying infected cattle at the earliest stage;
- removing carriers; reducing risk of further spread through restriction of movement; and
- improving farm management.

Information on disease trends demonstrated to us that while the current bTB Eradication Programme has been effective at controlling the disease to some extent, it cannot be considered as a viable path to eradication. Indeed, following its audit of the NI Programme in June 2015, the FVO concluded:

*“The eradication programme is applied largely in accordance with planned arrangements but the herd incidence rate has stagnated at levels above 6%, which is not what would be expected with an effective eradication programme in place”.*<sup>16</sup>

The map below illustrates the wide distribution of bTB in cattle across NI.



**Figure 4** - Showing the density of herds with confirmed bTB breakdowns during three years from July 2013 to June 2016.

The disease has shown itself to be persistent and we believe that only a dynamic new approach will make the difference needed. It is against this background that we set out to develop a Strategy and associated Implementation Plan for the eradication of bTb in cattle in NI.

We have sought to address what, in our opinion, are the key and often inter-related issues which have prevented us eradicating the disease to date.

These can largely be summarised as follows:

- issues with the ability of the current test to detect infected animals;
- the perception that the disease is for Government to address;
- the perception that Government had become resigned to controlling rather than eradicating the disease;
- little sense of ownership by farmers;
- the perception that some farmers no longer proactively try to control the spread of bTB;
- the fact that stakeholders feel disengaged due to the lack of ability to input into the programme;
- the absence of a wildlife intervention strategy;
- varying levels of understanding of the disease and the risk of infection;
- variable standards of herd health management by farmers; and
- current compensation arrangements fail to incentivise good practice.

Our recommendations, which are designed to address these issues are set out in the Chapters that follow.

# Thematic Recommendation Chapters

## Section B

Given the complexity of the disease and the multitude of factors which impact on it, we focused on the key factors in disease spread and the steps necessary to effect the change we want to achieve. We have focused our recommendations into 7 key themes which need to be addressed in order to make a difference. These themes are however all interrelated and do not stand alone.

### Chapter 1

**Governance:** To establish effective governance arrangements to oversee the reduction and eradication of bTB so enabling the farming industry, Government, PVPs, nature conservationists and other key stakeholders to work in partnership, with the principle of shared commitment.

### Chapter 2

**Culture and Communications:** To encourage a change in culture and attitude so that all stakeholders understand and accept the part they have to play in achieving bTB eradication and recognise that their contribution will make a difference. To improve communication so that all stakeholders receive relevant, timely and appropriate information.

### Chapter 3

**Tools and Processes:** To minimise the potential for bTB transmission to herds, within herds and from herds, through the maximisation and enhancement of the existing tools and processes, and the utilisation of emerging technologies.

### Chapter 4

**Wildlife:** To address the bTB reservoir in badgers to help eradicate bTB in cattle herds and contribute to the health of the badger population.

### Chapter 5

**Herd Health Management:** To promote improved herd health management across all types of cattle holdings, slaughterhouses and at cattle markets, in order to reduce the risks associated with the spread of disease, and introduce actions and practices that will improve herd health.

### Chapter 6

**Finance:** To re-balance the cost of the disease between the public and private sectors, so encouraging a change of culture and attitude, and a shared commitment to the control and eradication of bTB. To identify new sustainable arrangements which would allow Government to maximise and better deploy resources.

### Chapter 7

**Research:** To ensure that research into bTB is given a priority within the DAERA research agenda. To ensure that the Tuberculosis Eradication Partnership (TBEP) has the ability to influence the bTB research agenda, is aware of emerging recommendations from research to inform future reviews of the Strategy and has a role in disseminating relevant research findings to stakeholders.



The recommendations across the 7 themes represent a fresh and integrated approach to allow NI to achieve bTB free status and eventual eradication. There will be no quick wins, indeed the recommendations are likely to result, in the short term, in an increase in disease detection rates, as infected animals are identified and removed sooner.

This is a long term Strategy but we firmly believe that the combined effect of all the recommendations will be a steady and sustainable decline in the rates of disease from 2020 leading to the eventual eradication of bTB in cattle here.

Long term progress in disease reduction will depend on many factors such as:

- the resource that is made available;
- how well the recommendations are implemented;
- compliance;
- the degree of co-operation between stakeholders; and
- whether the recommendations prove to be sufficient as eradication progresses.

We anticipate, given experience internationally, in particular from the RoI and New Zealand, that it could take some 3 to 4 decades from where we are now to see the disease eradicated.

The disease picture and the environment in which we are working will be ever-changing and, no doubt, there will be emerging thinking and findings from research and experience elsewhere. We, therefore, anticipate that this Strategy and its effect will be kept under constant review to take account of the changing environment, to ensure that expected outcomes are being achieved and that the recommendations are working. This would be a key role for the proposed new oversight group (details in Chapter 1 Governance). We envisage the Strategy would be progressively recalibrated as we work towards disease eradication, with a formal review at least every 5 years.



# 1. Governance

## Our Objective

To establish effective governance arrangements to oversee the reduction and eradication of bTB so enabling the farming industry, Government, PVPs, nature conservationists and other key stakeholders to work in partnership, with the principle of shared commitment.



## What is the issue?

At present, DAERA is the Competent Authority and is responsible for implementing EU and local legislation, policy and programme development, and budgetary control. Significant policy changes and legislative amendments are subject to public consultation, with discussion and oversight by the NI Assembly Agriculture, Environment and Rural Affairs (AERA) Committee.

Following its audit of the NI Eradication Programme in June 2015, the FVO concluded that the Eradication Programme was applied largely in accordance with planned arrangements and no significant governance issues were raised. It noted, however, that the herd incidence had “stagnated” which was not what would be expected with an effective Eradication Programme in place. The audit team identified a number of strengths and weaknesses among which was the need for engagement and commitment of stakeholders (see Chapter 2 Culture and Communication). In particular, the FVO indicated that DAERA had yet to get:

*“the key stakeholders fully engaged as co-owners of the bTB eradication programme”.*<sup>16</sup>

In addition, under current arrangements there are limited mechanisms through which other stakeholders, including farmers and nature conservationists, can have input into the bTB Eradication Programme. As a result, stakeholders can feel distanced from the efforts to eradicate bTB.

DAERA hosts formal meetings of the Animal Health & Welfare Stakeholder Forum and the bTB Stakeholder Working Group on a quarterly basis. These groups include a wide range of industry and veterinary representatives as well as DAERA officials but mainly facilitate information exchanges and there are limited opportunities to influence the programme.

DAERA also meet, on an ad hoc basis with representative bodies such as the UFU, Livestock and Meat Commission (LMC), NI Meat Exporters Association (NIMEA), milk processors and nature conservation bodies. This is generally on a reactive basis in response to issues.

Based on the evidence presented to us, we believe there is a need to widen the governance structure around the bTB Eradication Programme to facilitate responsibility sharing and encourage attitudinal change among all stakeholders, including Government.

We have also addressed the issue of why culture change is necessary in Culture and Communication Chapter 2.

### Why is this important?

The issue which we want to address is a lack of shared responsibility for the eradication of disease which the current structures seem to encourage. Without pro-active engagement by all stakeholders the bTB Eradication Programme will continue to be perceived as a Government imposed requirement. Evidence from other countries tells us that a model of joint responsibility transforms the focus from one of ‘the testing programme’ to the eradication of the disease itself.

The farming industry and other stakeholders need to have a meaningful partnership with Government and active input into both the programme and the policy which underpins it, including the review of targets and progress. There should be shared ownership of the plan to eradicate bTB, with meaningful collective responsibility and recognition of the skills and knowledge that each partner brings to the table. We see this as being crucial in changing the culture surrounding bTB in NI.

We fully recognise that this is a long term Strategy. Throughout the process, therefore, it would be essential to ensure that progress and targets are routinely reviewed in order to identify reasons for any variance and adapt the programme as necessary. Through this mechanism, we want to ensure that the programme would be suitably responsive to wider developments which should also take into account emerging science and evidence, drawn from both local and international research.

### What do we think needs to be done?

We consider that a new governance structure should be established.

**Recommendation 1.1:** We recommend that a new governance structure should be put in place, with the establishment of:

- a NI level oversight body, the TB Eradication Partnership (TBEP)
- a small number of Regional Eradication Partnerships (REPs), and
- responsive local Disease Response Teams (DRTs).

Each level should involve representatives from the farming industry working in partnership with DAERA, PVPs, nature conservationists, bTB scientific experts, and other key stakeholders. They would, operate under the principles of active participation by everyone, have a focus on disease eradication and an ability to influence policy and disease control. At a NI level they would work in partnership with Government in developing strategic direction.

## Establishment of a new oversight and disease response structure

The proposed new structure would have three levels (NI, regional and local level), each with varying degrees of responsibility. This proposed approach is radically different from what has gone before. We want to see engagement at all levels with a network of regional and local engagement opportunities, allowing stakeholders to feel included and be part of a collaborative approach to tackling bTB.

As recognised in the independent behavioural assessment of our recommendations, reaching accommodation between the diverse stakeholder groups will be a significant challenge. We fully recognise the potential difficulties, but radical changes are needed if we are to succeed in eradicating this disease.

### Northern Ireland level

The **TB Eradication Partnership (TBEP)** would fulfil an expert committee role, providing advice to the Chief Veterinary Officer (CVO) and policy makers within DAERA on strategic and operational issues and monitor progress of the bTB Eradication Programme. It would have access to the DAERA Minister on any significant issue and would be prepared to give evidence to the NI Assembly Agriculture, Environment and Rural Affairs Committee, as required.

The suggested membership of the TBEP should be:

- An independent chairperson;
- Two representatives from the farming community;
- A representative from the processing sector;
- A nature conservationist;
- A Private Veterinary Practitioner; and
- A scientist with an appropriate background relevant to bTB.

The TBEP should be established following a public advertisement and recruitment process, in accordance with the established principles of public appointment (based on the Commissioner for Public Appointments in NI (CPANI) Code of Practice) and they should be appropriately remunerated. Members should be appointed with varying lengths of term, to provide continuity of experience and to prevent all members coming to the end of their tenure at the same time.

In addition, two senior DAERA officials, the CVO and the Director of Animal Health and Welfare Policy Division should attend the TBEP as ex-officio members. The TBEP should work with the CVO in setting the future direction of the bTB Eradication Programme, targets and milestones.

While members of the TBEP would be representative of sectoral interest(s), they would be required to act in the public interest.

Their primary objective would be to work collaboratively and in partnership, with Government, towards the eradication of bTB in NI. The TBEP would formally review the Eradication Strategy

and Implementation Plan every 5 years, as a minimum, and make recommendations to the Minister.

Specifically it should:

- work closely with DAERA to support the implementation of the agreed NI bTB Eradication Strategy;
- provide a high level collaborative interface between the key players;
- have input into the setting of goals to ensure that the direction of the programme towards eradication is established and maintained;
- have responsibility for reviewing targets for control, reduction and eradication of bTB;
- have oversight responsibilities in relation to the delivery of the bTB Strategy and related targets;
- work in partnership with DAERA and all key stakeholders on the future development and communication of the Strategy;
- consider reports from and if appropriate, act on recommendations from the Regional Eradication Partnerships (REPs);
- consider scientific findings and facilitate dissemination of information to other groups; and
- work with DAERA to deliver an effective communications strategy.

### Regional level

Three **Regional Eradication Partnerships (REPs)** should be established to ensure there would be specific focus on bTB eradication in their particular geographical region.

The REP's key objective would be to work collaboratively and in partnership with Government and stakeholder representatives to effect the eradication of bTB in their area. REPs would also provide advice and feedback to the TBEP.

The suggested membership of the REPs should be:

- An independent chairperson;
- Two farmers from the region;
- A Private Veterinary Practitioner; and
- A nature conservationist from the region.

In addition, meetings would be attended by the relevant regional DAERA Veterinary Managers as ex-officio members and a DAERA epidemiologist as necessary.

It is envisaged that the TBEP would have a role in the selection of members to sit on the REPs. Members should not be paid but reasonable out of pocket expenses should be covered.

While members of the REPs should be representative of sectoral interest(s), they would be required to act in the public interest.

Specifically, the REP would, with regard to its specific region:

- have an overview of disease incidence;
- monitor action and responses to control and reduce disease;
- examine the impact of disease risk factors and recommend appropriate control measures to DAERA and the TBEP as appropriate;
- review reports from local Disease Response Teams (DRTs) and recommend appropriate actions;
- report to the TBEP including recommendations for action to enhance control;
- disseminate information to stakeholders in relation to the implementation of the bTB Eradication Strategy; and
- provide a forum where key players can collaborate.

## Local Level

At a local level, **Disease Response Teams (DRTs)** should be formed on an ad hoc basis in response to a serious outbreak, repeated breakdowns in the area, or to deal with particular disease issues.

A DRT would be convened by a local DAERA Veterinary Manager and should provide an opportunity for local direct involvement in disease control. It would escalate issues as necessary to the relevant REP.

These teams would provide the opportunity to share information on bTB breakdowns, response actions and options, seek local support and engagement to address the disease, protect other local herds and disseminate the most up-to-date information on disease outcomes in their locality.

A DRT would seek to include the following, as deemed appropriate in response to the local situation and circumstances:

- a local DAERA Veterinary Manager who would act as convenor and chairperson;
- relevant farmers in the affected area;
- Private Veterinary Practitioners working with affected farms;
- representatives from local nature conservation groups; and
- others as deemed appropriate, which might include a representative of the local livestock markets, processor or contractors.



Specifically, members of a DRT would, with regards to its specific area:

- work collaboratively and in partnership;
- bring affected farmers together to discuss how best to implement disease control measures;
- review farm interactions, land ownership, disease and contact dynamics, biosecurity, standards of service;
- consider disease risk factors and contact between farms;
- discuss relevant issues, including wildlife issues, and recommend appropriate control measures; and
- escalate issues and report to the REP as necessary.

Members of the DRT should not be paid but reasonable out of pocket expenses should be covered.

It is envisaged that each of the groups established within the new governance structure would be subject to a confidentiality agreement and would be bound by the Data Protection Act and be subject to defined terms and conditions.

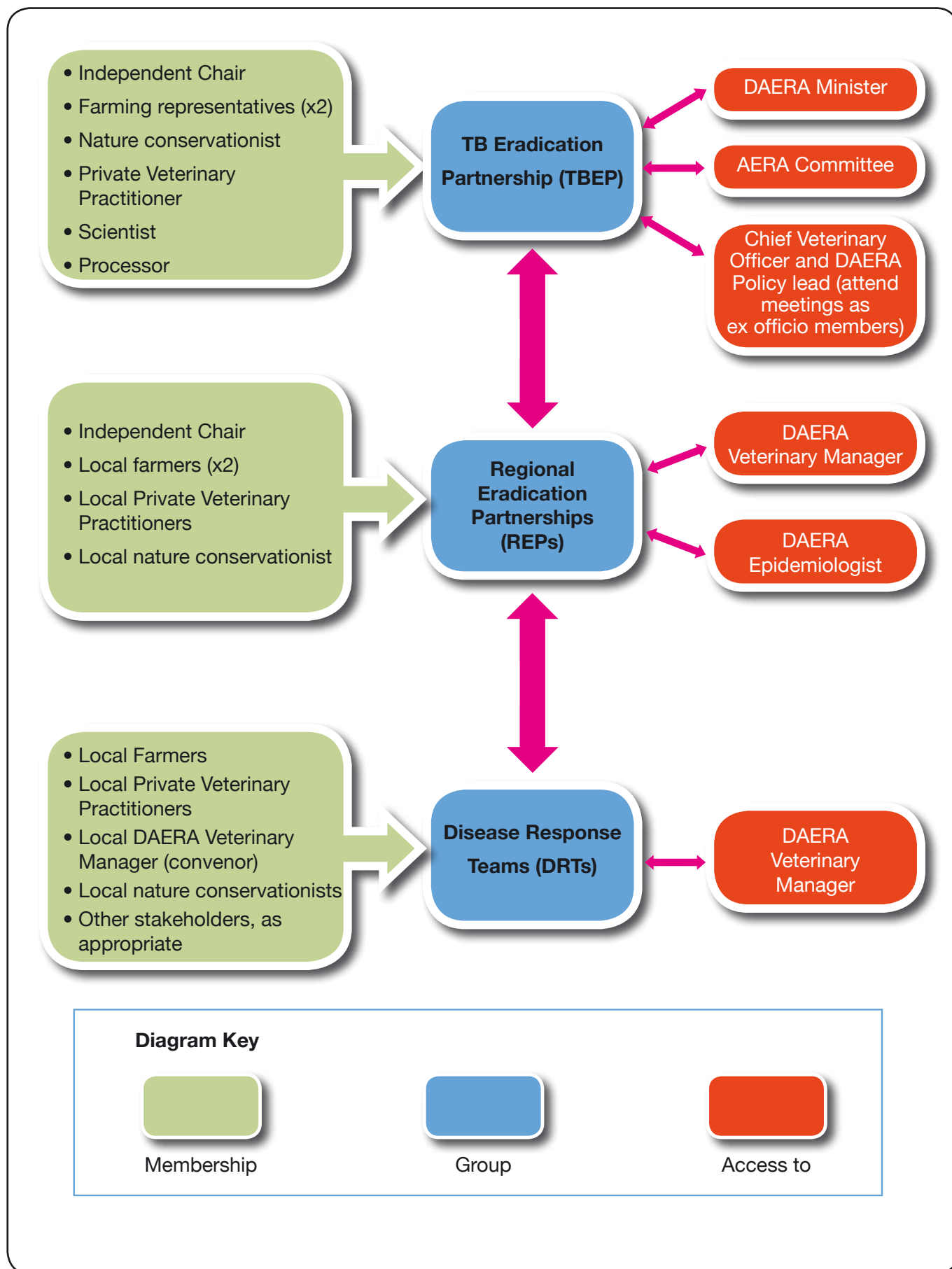


Figure 5- Illustrates how the new lines of communications might operate.

## Who is going to do this and when should it be done?

TBSPG should continue in our role as the oversight and monitoring body for the agreed bTB Eradication Strategy until the TBEP is established.

DAERA should establish the TBEP through a formal appointments process and we would expect it to be in place by December 2017.

Once established, the TBEP should take responsibility for the setting up of the REPs. These should be in place by late Spring 2018.

As outlined, DRTs would be established on an ad hoc basis in response to disease situations.



## 2. Culture and Communication



### Our Objectives

To encourage a change in culture and attitude so that all stakeholders understand and accept the part they have to play in achieving bTB eradication and recognise that their contribution will make a difference. To improve communication so that all stakeholders receive relevant, timely and appropriate information.

### What is the issue?

As mentioned in the section of this report titled A New Approach, the European Commission, in their 2013 Working Document on the Eradication of bTB in the European Union, noted that:

*“... it is essential that all stakeholders involved in the eradication programme, independent of their respective roles and responsibilities, [should] actively commit and contribute to the full implementation of all the measures of the programme.”<sup>4</sup>*

This was reiterated by the FVO in their 2015 Report.<sup>16</sup>

There is a perception that farmers consider that bTB is a matter for Government to resolve rather than an industry problem, with some no longer proactively trying to control the spread of bTB and almost accepting that it is part of farming life. It is also perceived that, generally, farmers have lost sight of bTB as an infectious disease and that their concerns relate more to DAERA’s testing regime and the lack of action in relation to wildlife and compensation. These perceptions were reflected in our engagement with stakeholders, some of whom felt that the bTB Eradication Programme encouraged this detachment, particularly through the level of compensation paid.

This viewpoint is also reflected in the European Commission Working Document on Eradication of Bovine Tuberculosis in the EU (section 3.11)<sup>4</sup> where it was stated that:

*“compensation schemes should be subject to regular review and linked to the herd-owners’ compliance”.*

Additionally, it stated that:

*“The compensation scheme should also be aimed at modifying the behaviour of the farmers in a way that they avoid the introduction of the disease and further spread in their herds”.*

There is also a view that Government had become resigned to controlling the disease and was no longer actively pursuing an eradication agenda.

The evidence that we have gathered from other countries makes it obvious to us that success in tackling bTB is predicated on there being a shared commitment by Government, PVPs,

farmers, the agri-food industry and nature conservationists. Achieving eradication will take time, resources, industry discipline and a united focus on the desired outcome. We want to change how people view bTB so that all stakeholders are clearly focused on eradicating the disease and understand and accept the positive contribution they can make by tackling the factors within their control. When we talk about culture change, it is this new common sense of purpose that we want to create and develop.

In relation to communication, we have heard that, while there is a large range of information currently being provided by DAERA through its website, on-farm engagement, the College of Agriculture, Food and Rural Enterprise (CAFRE) delivered training and the wide range of leaflets aimed at providing advice and guidance to farmers, this range of information has had limited impact in communicating key messages. We have heard that a proportion of the farming community are still not well informed about bTB, its nature, cause, effects or how to prevent it.

Importantly, we met with both DAERA headquarters and field staff, and heard some concerns about the internal flow of information within the Department, including how local intelligence is communicated to influence decision making, and how policy changes and decisions are delivered to staff in the field.

### **Why is this important?**

We are proposing a new approach and a new way in which bTB can be addressed. It is important that a distinction be made between what has gone before and our proposed new way forward. It is vital that this Strategy should not be seen merely as the “old programme with a new coat of paint”.

Implementing this Strategy will require time, commitment and funding.

Central to its success would be the ability of all stakeholders to embrace a new mindset about the disease, and to develop working relationships and a new culture based on a shared understanding and commitment.

Many of the recommendations we have made throughout this Strategy are intended to help facilitate the culture change we believe is necessary.

In particular, we hope that the recommended changes to the governance arrangements, and the setting-up of new structures, should enable a meaningful partnership between Government and stakeholders to be established, and allow for the development of a shared commitment to eradicating the disease.

Independent Consultant Dr. Philip Robinson states in his behavioural appraisal of our recommendations:

*“This is a new and radical form of bTB governance for Northern Ireland and is (to my knowledge) a unique coalition in terms of managing bTB globally. Bringing together such diverse actors will most definitely bring challenges for all of the stakeholders involved”.<sup>17</sup>*

We accept that achieving this culture and attitudinal change will be challenging, particularly as some key recommendations which will help to facilitate it may be difficult for some stakeholders to embrace. It is therefore particularly important that all stakeholders see this Strategy as an interdependent package of recommendations.

We hope too that nature conservationists would recognise the need for targeted action on badgers as a disease reservoir, as well as the benefits which would accrue for the health of the badger population.

We also hope that the signal from Government that it is prepared to take a holistic and balanced approach to tackling bTB, not only in cattle but also in wildlife, would encourage a change in farmers’ behaviour (for example, more acceptance of the need for better herd health management, see Chapter 5). We understand that some farmers have resisted taking additional biosecurity measures arguing (erroneously) that such measures would not help to protect their herds while Government was not tackling the bTB reservoir in badgers.

Recommendation 5.3 encouraging PVPs and DAERA staff to provide advice to farmers (see Chapter 5 Herd Health Management) should help not only to develop a relationship based on trust (changing its character from being one of “testing and enforcement” to a broader and more inclusive one), but also help to increase a better understanding of bTB as an infectious disease.

We recognise that many of our recommendations in relation to tools and processes, (see Chapter 3), are likely to result in greater identification of disease in cattle, particularly in the short term, with a consequent impact on farmers. It will be crucial that the industry both understands and accepts that such recommendations are a vital component of the Strategy and part of the concerted effort to target and remove the disease at the earliest possible point, with a view to reducing potential spread.

Similarly, farmers would need to recognise and accept the need for changes to the compensation regime. As noted in Chapter 6 Finance, we consider the changes in the compensation regime to be essential in order to change attitudes towards the disease. Any reduction in the compensation bill, however, should also help to facilitate further investment by Government in tackling the disease.

As stated earlier it is hoped that the new governance structures would facilitate discussion, consultation and collaborative working and that through this we could forge a shared vision and a culture based on understanding and compromise. The potential is there to further



develop the new structures in time, perhaps to afford stakeholders a greater role as the culture changes (for example, as in New Zealand where there is a different model of responsibility and cost sharing<sup>18</sup>). This is likely to be considered as the strategy is developed over time.

A priority now is to focus on improving understanding through communication so that stakeholders can understand what is being done and why, and importantly, what impact these actions are having on the disease.

The recommendations in relation to the role which epidemiology and research, (outlined in Chapter 3 Tools and Processes and Chapter 7 Research) can play in tackling the disease at both a local level and strategically, would also contribute to our desired outcomes.

Thus, effective use of these tools and proper communication of outcomes would help to improve understanding and encourage acceptance by stakeholders of their respective responsibilities in preventing the spread of disease.

In time, this would help to embed the necessary culture change. We acknowledge in this Strategy that there are some aspects of farming culture in NI which can contribute to disease spread and which could take time to change or adapt such, as the role of livestock markets and the use of conacre (see Chapter 3 Tools and Processes and Chapter 5 Herd Health Management). It is, however, important to start the conversation about what can change now, what might need to change going forward and how this could be achieved over time. With this in mind, we have made various staged recommendations.

We recommend that all stakeholders, including Government, work in partnership and share the responsibility for eradicating bTB. As outlined above, many of the individual recommendations contained in the Strategy would contribute to the necessary culture change in addition to their key stated purpose, particularly when implemented as a package.

**Recommendation 2.1:** We recommend that a vigorous publicity, communication and knowledge transfer plan should be developed by the TB Eradication Partnership (TBEP) and implemented in conjunction with key stakeholders.

## What do we think needs to be done?

The purpose of such a publicity, communication and knowledge transfer plan would be to:

- initially promote an understanding of the bTB Eradication Strategy and raise awareness of its key recommendations and actions;
- ensure that stakeholders receive relevant timely and appropriate information to allow them to mitigate risks;
- provide key information on bTB control and eradication;
- promote best practice;
- ensure an effective flow of communication within DAERA;
- ensure that messages are in a format which is appropriate to the audience; and
- use new and innovative methods to provide farmers, in particular, with information to allow them to benchmark their performance against others.

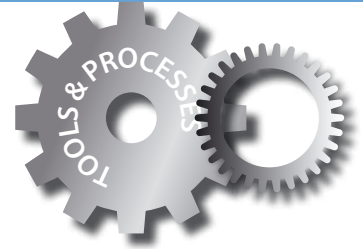
## Who should do this and when should it be done?

Various recommendations under individual themes, which would contribute to both culture change and improvements in communication, should be implemented in accordance with the recommendations set out in the relevant chapters of the Strategy.

The TBEP would work with all stakeholders, including Government, to ensure that all messages are timely, relevant and appropriate to the audience. The TBEP would also seek to include new and innovative ways of communicating. Industry groups, such as Animal Health & Welfare NI (AHWNI), could play a significant part in the production of material and advice.



## 3. Tools and Processes



### Our Objective

To minimise the potential for bTB transmission to herds, within herds and from herds, through the maximisation and enhancement of the existing tools and processes, and the utilisation of emerging technologies.

### What is the issue?

For most farmers, DAERA's testing programme is the most familiar part of bTB control. The purpose of the programme is to identify and remove infected animals as quickly as possible and to reduce the opportunity for infection to be transmitted to other cattle.

There are, however, limitations with the tests currently available.

At present, there is currently no single test which fulfils all the criteria necessary to identify all infected animals.

One of the issues with the current programme is the ability of the current test to detect infected animals. While the available evidence suggests that the SICCT (the skin test) has a specificity (probability that a truly uninfected animal will test negative) of 99.98%, we know that the sensitivity (probability that an infected animal will test positive) is low, possibly as low as 50-60% when used at standard interpretation. This means that at any herd test potentially 50% of infected animals may not react to the test and go undetected and increase the risk of disease spread. Repeated herd testing in higher risk situations, and use of severe interpretation and gamma interferon testing, increases the probability of detecting such animals.

The skin test is the standard EU test for screening cattle for bTB. EU legislation requires that it must be used for routine herd testing. It is based on a comparison of the reaction of an individual animal to injections of bovine and avian tuberculin and forms the basis for the identification of individual cattle that are infected with bTB in the UK and RoI.

Efforts to develop alternative blood based tests have been hampered by the complex nature of the disease. The most common alternative test in use is gamma interferon. It is only approved in the EU for use as a supplementary tool in conjunction with the skin test to identify additional infected animals not picked up by the skin test, which means there is the potential for more rapid clearance of infection.

Test **Sensitivity** can be defined as the probability that a truly infected animal will test positive. There is evidence to indicate that bTB test sensitivity may be reduced by other diseases including Johne's disease and liver fluke infestation.

Test **Specificity** can be defined as the probability that an uninfected animal will test negative.

This test has a higher *sensitivity*, but in its current format is more costly than the skin test and has a relatively low specificity (higher numbers of false positives), which limits its application. Therefore, its use is targeted at certain categories of herds where there has been evidence of infection.

Of necessity, therefore, a combination of approaches is required if we are to maximise our ability to diagnose the disease. We can improve the likelihood of identifying and removing infected animals through repeated skin testing, using gamma interferon and/or reducing the threshold for animals to be made reactors to the skin test (severe interpretation).

### What do we think needs to be done?

One of our first challenges was to consider what more could be done regarding the testing regime, in order to improve disease detection and have infected animals removed more quickly.

We were encouraged when the FVO published its final audit report in January 2016<sup>16</sup> which evaluated the effectiveness and the progress of NI's existing bTB Eradication Programme. Many of the FVO's recommendations mirrored our thinking. DAERA, in response, has already begun to implement some actions which are in line with our considerations relating to the early detection of infection. We welcome DAERA's engagement with us and its openness to considering our direction of travel.

Building on these early discussions, we are recommending a more expansive and flexible suite of measures that can be used, as appropriate, depending on the particular circumstances of the outbreak.

## 1. Improved surveillance

### 1.1 Ensure any Private Veterinary Practice contracts align with our recommendations - why is this important?

In 2016, DAERA introduced a new contract with Private Veterinary Practices for the provision of bTB testing and its associated services. The emphasis was on the quality of testing and it is expected to improve detection rates.

Looking forward, there may be potential to further develop contractual arrangements of the Private Veterinary Practices contract to implement some of the recommendations in this strategy, specifically around provision of advice and support. This is of particular importance for our recommendations in Chapter 5 Herd Health Management.

**Recommendation 3.1.1:** We recommend that DAERA ensures that optimum levels of test sensitivity are achieved through robust training, management and monitoring of all testing vets. We are pleased to see that DAERA has appointed a contract manager for this purpose and recommend that the results of the monitoring are regularly provided to the TBEP.

## 1.2 Abattoir Surveillance - why is this important?

Every bovine animal slaughtered in NI is subject to post mortem inspection. Whilst the primary purpose of the inspection is public health, it also forms a significant part of bTB surveillance. It is important that this surveillance is rigorously and uniformly applied across all slaughter establishments to maximise the value of this surveillance, enable earlier detection of infection and contribute to a reduction in spread by enabling tracing of infected animals back to herds and subsequent action.

We were concerned about the variation in submission and confirmation rates as highlighted in a DAERA Veterinary Epidemiology Unit (VEU) report and reflected in the FVO report recommendations. We note that DAERA has taken immediate steps to rectify the matter and that new monitoring systems are in place. We agree with the approach being taken by DAERA and the TBEP should continue to monitor the surveillance outcomes as evidenced by future VEU reports.



*Image courtesy of: DAERA*

**Recommendation 3.1.2:** We recommend that this important aspect of disease surveillance must be as rigorous as possible and uniformly applied across all NI slaughterhouses. We agree with the approach being taken by DAERA and recommend that it continues to monitor the surveillance outcomes.

## 2. Improved management of bTB infected herds

### 2.1 Expand the use of severe interpretation of the skin test - why is this important?

The sensitivity of the skin test (ability to detect infected animals) can be increased by applying a more stringent interpretation of test results. There is convincing evidence that animals which test positive on severe interpretation, but are not removed, are at a significantly increased risk of becoming reactors. It is important that we facilitate the earliest possible removal of infected animals from a herd. This would reduce the risk of further spread of infection. This is in line with our strategic aim in relation to the disease, which is to identify, act and remove diseased animals as quickly as possible.

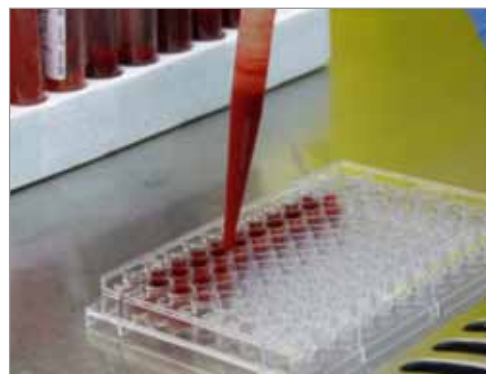
**Recommendation 3.2.1:** We recommend that DAERA expand its use of severe interpretation during breakdowns in “Officially Tuberculosis Free Status Withdrawn (OTW)” herds to require the removal of all animals that are inconclusive on standard interpretation of the skin test.

We also recommend that DAERA should undertake further epidemiological analysis to assess the potential for wider use of severe interpretation of the skin test.



## 2.2 Increase the use of gamma interferon (IFNG) testing - why is this important?

Gamma Interferon testing can detect infection earlier than the SICCT (the skin test) and increases the sensitivity of surveillance testing. While we recognise that this test cannot be used as a primary surveillance test due to current OIE and EU rules governing bTB testing, studies have shown that animals that are positive to the test are at a higher risk of becoming skin test reactors in the future. It is, therefore, important that it is used in parallel with the skin test in high risk herds/groups or whenever herd depopulation is being considered (see paragraph 2.8). Other countries such as the RoI, England, Wales and Spain have recently been increasing their use of gamma interferon testing to improve detection rates.



Photograph used with the permission of Cliff Mason, AFBI.

In NI, use of the gamma interferon testing is currently constrained by laboratory capacity, cost and logistics and, therefore, the test cannot be used in many infected herds. In addition, because of these constraints, the test is offered to farmers on a voluntary basis only and removal of positive animals is also voluntary. Therefore, farmers might turn down the opportunity to have their animals blood tested or may retain gamma interferon positive animals (which have not tested positive to the skin test). These animals can then eventually be sold to another herd, despite being at higher risk of becoming a reactor to the skin test. On that basis, we believe that the use of gamma interferon testing should be expanded and deployed more widely to facilitate the timely removal of as many infected animals as possible. We also recommend that gamma interferon testing of animals should be made compulsory where DAERA considers it necessary, as should the removal to slaughter of gamma positive animals.

*“Parallel testing using IFNG (gamma interferon) increases the sensitivity of the diagnostic regime. This allows earlier removal of a considerable number of infected animals that would have given a false negative reaction to the skin test and would otherwise have remained undetected for an undetermined period potentially facilitating disease spread.”*

The European Commission working document on Eradication of Bovine Tuberculosis in the EU (SANCO/10067/2013).

**Recommendation 3.2.2:** We recommend that the use of the Gamma Interferon (IFNG) test is expanded to remove infected animals as quickly as possible.

In particular, we recommend that DAERA makes it compulsory for:

- (i) herd-keepers to have the test if the Department considers it necessary; and
- (ii) for all animals positive to the gamma interferon test to be removed.

## 2.3 Take action on chronic herds – why is this important?

It is recognised that certain herds have a much greater tendency to develop prolonged and/or recurrent bTB breakdown incidents. These have become termed as ‘chronic herds’. These



herds are an issue for farmers and DAERA because of the length of time they are restricted, the frequency of recurrence of disease, and the number of animals removed. This results in disruption to business, additional costs and has an impact on other herds which are disproportionate when compared to average breakdowns.

**Recommendation 3.2.3:** We recommend that ‘chronic herds’ should be recognised as a distinct entity for action.

We also recommend that there should be a renewed approach to dealing with chronic herds. This should involve using relevant measures and processes, already identified, in a package targeted at resolving or minimising their impact.

The TBEP and DAERA should continuously monitor ongoing research into chronic herds to better focus current, and develop new, approaches to dealing with them.

## 2.4 Require a herd test prior to re-stocking – why is this important?

DAERA currently allows keepers to buy animals into breakdown herds before they have tested any of the remaining cattle in the herd which had negative test results. This is in breach of the EU legislation which requires negative results on all animals after a full herd test, before allowing movement onto a farm following any disclosure of disease, and further prevents restocking of herds subject to epidemiological assessment.



We recommend DAERA should move towards compliance with EU legislation. This would reduce the potential for any non-compliance with legislation to impact on the industry either through infraction proceedings or as a barrier to trade.

Research in the RoI shows that a move towards full compliance may have some bTB control benefits. Herds into which animals were introduced before the first test had an increased risk (1.5 times higher) of subsequent breakdown.

**Recommendation 3.2.4:** We strongly recommend that DAERA should move to prevent restocking of all breakdown herds until after the first herd re-test (and subsequent removal of any reactors).

- (i) We recommend that, in the medium term, DAERA should prevent restocking of herds that do not test clear at the first retest (subject to epidemiological assessment).
- (ii) In the longer term, we recommend that the TBEP should consider whether it would be beneficial to require a negative full herd test, before allowing movement onto a farm following any disclosure episode (herds that are Officially Tuberculosis Free Status Suspended (OTS) and Officially Tuberculosis Free Status Withdrawn (OTW)) and further prevent restocking of herds (subject to epidemiological assessment).

## 2.5 Reduce the number of Non Visible Lesion at slaughter (NVL) reactors required for OTW consideration – why is this important?

The management of herds with OTW and OTS breakdowns is fundamentally different. Specifically, disease control is much more rigorous and continues for a longer period following OTW breakdowns compared to OTS breakdowns.

Therefore, the level at which herds become OTW has important implications for disease control. Specifically, herds that have OTW status applied because of infection must complete two clear herd tests before OTF status can be restored. Only one clear test is necessary for an OTS herd to have its OTF status restored. In addition, herds and animals that are deemed to be at additional risk of infection (either because of their locality or because of animal movements) are required to be tested. Therefore, the application of OTW status maximises control efforts in infected herds and minimises the risk of infection remaining undetected. The level at which OTW should be applied is best determined by epidemiological research.

**NVL** - The term is used when No Visible Lesions of bTB are found during post mortem inspection of animals that have been compulsorily removed by DAERA to control bTB. If there is a reactor in a herd the breakdown is highly likely to be caused by *M.bovis* even if the post-mortem result and subsequent laboratory test results are negative.

**Finishing herd** - A Beef finishing herd is a herd that buys cattle to bring them up to prime condition for slaughter.

**CHT** - A Check Herd Test is allocated to all herds that have been cleared following a bTB episode. The CHT is usually scheduled for 6 months after OTF status has been restored.

**OTF** - Officially Tuberculosis Free and is used in the EU directive 64/432 to describe those cattle herds that may undertake intra community trade.

**OTS** - OTF Suspended. The OTF status of a herd is suspended when bTB is suspected but has not been confirmed or when a test is overdue by a specified period.

**OTW** - OTW - OTF Withdrawn. The OTF status of a herd is withdrawn when:

- bTB is confirmed in one or more animals; or
- there is a total of more than 5 animals that are either unconfirmed reactors or have shown unconfirmed lesions at routine slaughter during a breakdown; or
- it is considered prudent because of epidemiological concerns; or
- an animal shows clinical signs of bTB; or
- a herd test is overdue for a specified period.

**Depopulation** is the removal of all or part of a herd for the sole purpose of prevention of further disease. The animals removed will include negative in contacts (NICs) which are animals that are identified as a disease risk, due to their exposure to infected animals, but are not positive to a diagnostic test.

Currently, in NI, one of the conditions for a herd to be made OTW is where there are a total of more than 5 animals that are either NVL reactors or have shown unconfirmed lesions at routine slaughter during a breakdown.

We have considered studies examining how the disease spreads, as well as information from other countries. This suggests that there would be a significant benefit to bTB control from reducing the number of NVL reactors required for a herd to be made OTW, triggering additional controls. A DAERA study indicated that the risk of future breakdowns increases directly with the number of bTB reactors during a breakdown and the size of a bTB breakdown herd. It showed that infection being confirmed in reactor cattle was not a factor in predicting the risk of a future bTB herd breakdown<sup>19</sup>. We, therefore, consider that the number of NVL reactor animals required for a herd to be considered OTW (and therefore subjected to the same control measures as 'confirmed' bTB breakdowns) should be reduced from more than 5 to 2. This recommendation aligns closely with the view of the FVO and the evidence in previous studies conducted on this subject in NI, Great Britain and the RoI.

**Recommendation 3.2.5:** We recommend that a herd with two or more Non Visible Lesions (NVL) reactors should have its Officially Tuberculosis Free (OTF) status withdrawn (OTW) and should require two consecutive clear herd skin tests at least 60 days apart to regain OTF status. Tracing and checking of epidemiologically related herds should also be carried out.

## 2.6 Allow limited moves from bTB Breakdown Herds in certain conditions – why is this important?

We recognise that when a herd is restricted for bTB for an extended period, overstocking and cash flow difficulties can occur. Movement restrictions are required by EU law and these laws exist to reduce the risk of disease spread from a breakdown herd to other herds. Protecting other herds is essential. However, we believe if there are suitable destination herds, some moves from breakdown herds could be justifiable. We recommend that DAERA consider permitting lower risk moves (such as the movement of young calves to 100% housed rearing/finishing herds) provided the risk of bTB spread from these herds is managed by a strict biosecurity protocol. Animals from these herds would then be restricted so that they could only move from the rearing/finishing herd to another approved finishing herd or direct to slaughter.

**Recommendation 3.2.6:** We recommend that DAERA consider permitting limited moves from bTB breakdown herds to approved rearing/finishing herds which are 100% housed and meet strict biosecurity conditions.

## 2.7 Introduce an additional 6 month test for de-restricted herds – why is this important?

We found evidence that herds with a recent history of infection are at continuing risk of infection for an extended period after de-restriction. Therefore, they are more likely to fail subsequent bTB tests compared to a herd with no history of infection. The most likely reasons for this are:

- undisclosed infection remaining in a herd at the end of a breakdown;
- continuation of environmental risk factors; and
- recently purchased cattle.

Current DAERA policy is that a check herd test (CHT) is carried out 6 months after a breakdown herd has been cleared. If the CHT is clear, it is followed by another test 12 months later, as long as additional risk factors do not come into play. We have concluded that in high risk herds (i.e. herds with 2 or more skin test positive animals during a breakdown) a further test 6 months after the CHT should be introduced. This would give a further level of assurance to herd keepers and should help to reduce the risk of spreading undetected infection.

**Recommendation 3.2.7:** We recommend that DAERA consider that in higher risk breakdowns, a further herd test should be carried out 6 months after the Check Herd Test (CHT).

## 2.8 Full or partial depopulations – why is this important?

Herd depopulation is a well recognised tool for the control and eradication of infectious diseases in livestock. The aim of this approach is to increase the probability that infection within the herd will be eliminated by the removal of all infected/high risk animals. Its application is not particularly widespread here, often because of the risk of re-infection from external sources.

We consider that, in certain circumstances, full or partial depopulation can be beneficial. The existing infection levels in the locality and the likelihood of recurrence will play a major part in these considerations.

It is likely to be most cost effective in herds where it would be possible to prevent external reintroduction or spread to neighbouring OTF herds or, importantly, into a previously disease free wildlife reservoir.

**Recommendation 3.2.8:** We recommend that, in addition to application of measures to improve test sensitivity, the benefits of depopulation as a control measure should be positively considered in herds with multiple reactors. Partial depopulation should be particularly considered in herds where the reactors represent a significant proportion of a particular group.

### 3. bTB programme integrity and additional control measures

#### 3.1 DNA tagging – why is this important?

The use of DNA tagging is an important tool in ensuring that bTB reactor identification, valuation and removal is well correlated. We have however identified a gap in the current process. When reactor animals are detected by PVPs, a DNA tag is not applied until a DAERA valuation officer does so at the valuation stage. This is a number of days after the reactor has been identified and isolated. DAERA Veterinary Officers, however, apply these tags to positive animals when reading the test. If PVPs were to apply the DNA tags to all animals with positive readings when reading the test, this would assure the continuity of reactor identification and reduce the risk of errors or fraud, so strengthening disease control.

**Recommendation 3.3.1:** We recommend that Private Veterinary Practitioners (PVPs) should apply DNA tags to any animals that they detect with reactor readings when they are reading the test results.

#### 3.2 bTB Reactor Quality Assurance Checks – why is this important?

We have heard evidence that there are occasions when cattle are presented for valuation and slaughter which have given positive skin readings but not as a natural response to the injection of tuberculin the implication being that the test has been interfered with. Such actions are obviously fraudulent and morally wrong. Those engaging in such activity tarnish the majority of the farming community, impact on Programme costs, skew reported infection levels and negatively affect bTB control. The extent to which this occurs is not known but, anecdotally, it would appear that the occurrence is frequent enough to warrant further investigation. We, therefore, recommend further work be carried out to quantify the extent of the problem and to develop ways to stop this happening. A preliminary field trial of counter measures, if implemented, would develop our knowledge and understanding of, and help inform a policy decision on, the best approach to counter this activity.

**Recommendation 3.3.2:** We recommend that DAERA develops a preliminary field trial and associated research to help establish counter measures to prevent occurrences of cattle being presented as reactors which have not given a natural response to the injection of tuberculin.

## 4. Additional decision making support

### 4.1 Geographical Information System (GIS) – why is this important?

We are pleased to see that DAERA has introduced a new Geographical Information System (GIS) viewer to improve the efficiency of the bTB breakdown mapping process. This is used to identify herds that are in proximity to a breakdown and for which additional testing may be required to reduce the spread of disease.

There is significant potential to further develop this system to provide additional information to those involved in bTB eradication, and we would recommend this development takes place in support of our recommendations. This could facilitate the provision of epidemiological information to the TBEP and DAERA to assist with disease investigation communication and the provision of tailored advice.

It would allow for the visualisation of the bTB situation at a local, regional and national scale. This would help to identify and describe disease patterns, identify risks earlier, plan appropriate intervention strategies and monitor progress.

The development of links to the new Northern Ireland Food Animal Information System (NIFAIS) could potentially allow for real time information to be made available automatically and displayed on the GIS. The use of handheld devices could lead to further enhancement.

**Recommendation 3.4.1:** We recommend that the Geographical Information System (GIS) is further developed as a resource to meet the requirements of DAERA staff, Private Veterinary Practitioners (PVPs) and the governance groups as the Strategy evolves.

### 4.2 Use of molecular typing – why is this important?

We believe that existing and developing scientific techniques add a powerful dimension to understanding the dynamics of bTB (sourcing the origin of disease and tracing disease spread) independently of other recording systems.

Advances in the characterisation of the bTB organism (using techniques such as Variable Number Tandem Repeats (VNTR) and Whole Genome Sequencing (WGS)) are providing important tools for tracing the spread of the organism within and between the affected cattle and badger populations.

Current research has shown strong evidence of geographical localisation and local associations between the strains of bTB present in badgers and cattle. Over 180 unique VNTR types have been identified so far. While these techniques are already in use by DAERA, we believe that their use should be expanded as we seek to eliminate this disease.



**Recommendation 3.4.2:** We recommend that the use of molecular techniques should be expanded as we seek to eliminate bTB from our cattle.

## Who should do this and when should it be done?

The bTB Programme is not static; the testing of animals is a continuous process, as is the development of the approach and methods by DAERA in response to external reports, research and audits. DAERA veterinary officials have kept us informed of proposed changes in the programme throughout our work and much of their thinking has paralleled our own. As noted, some of our recommendations are already informing changes to DAERA bTB policy. This is very much welcomed.

The majority of our recommendations outlined in this section could be implemented within a short time frame following consideration by the Minister, but would require the amendment of staff instructions and possible training. Others, like the increased use of gamma interferon, would require additional resources to be secured. DAERA as the Competent Authority would be the lead partner in the implementation of these recommendations.

Private Veterinary Practices as part of new contract arrangements with DAERA would be integral to the delivery of these recommendations, which would need to be monitored and quality assured by DAERA. Some recommendations, such as DNA tagging, would require changes to legislation and, therefore, take time to introduce following acceptance of this report. DAERA would lead on delivery of these.

We are making these recommendations to enhance the current control programme and ensure that diseased cattle would be detected earlier and removed. This is critical if we are to reduce cattle to cattle spread of disease. This approach, in combination with a wildlife intervention programme, reflects the model which is used in those countries which are in the process of effectively eradicating bTB.

We expect that our recommendations would be strengthened and added to as the implementation of the Strategy unfolds, to ensure its ongoing success. This would be based on objective science based evaluation of the effectiveness of the measures.

It is in this context that we wish to highlight some additional measures that we have considered, but have decided not to make any recommendations at this stage on:

- pre-movement testing;
- delaying herd tests in bTB breakdowns until 60 days following removal of reactors rather than 60 days following the date of the last test;
- mitigating risk of previously skin inconclusive cattle by restricting their movement off farm; and
- extended form of contiguous testing around breakdowns assessed as having been caused by persistence of *M. bovis* in the locality – carryover/ contiguous spread/ wildlife.

These, and others, should be considered again at a future date by the TBEP and DAERA, as part of the ongoing review process.

When we considered the merits of introducing some form of pre-movement testing, various risk based pre-movement options were evaluated. However, the only option where obvious benefit could be ascertained was very narrow and only impacted upon a very limited number of cattle movements, i.e. in chronic bTB herd breakdowns. We therefore considered that it would be more effective to utilise resources more widely on measures that enhanced detection of infection and reduced the risk of residual infection within infected herds. These measures have been outlined in this Chapter and Chapter 5 Herd Health Management. We do not, however, rule out the use of pre movement testing in the future and it should be kept under review.

## 4. Wildlife

### Our Objective

To address the bTB reservoir in badgers to help eradicate bTB in cattle herds and contribute to the health of the badger population.

### What is the issue?

Throughout this Strategy, the focus has been on cattle related measures but it is also important to consider the risk posed by different species of wildlife. The current Eradication Programme is deficient in that there is no strategy to address the disease in wildlife.

### Why this is important ?

Experience in other countries has shown that bTB eradication will only be achieved through an integrated approach by simultaneously addressing all factors that meaningfully contribute to the persistence and spread of bTB in infected animal populations. In determining our approach, we have taken into consideration wildlife intervention research and programmes in England, Wales, the RoI and New Zealand.

### What do we think needs to be done?

We have examined the disease position in relation to wildlife.

We recognise that the wild deer population on the island of Ireland has generally increased, and it is known that deer can act as a host of *M. bovis* infection. We also recognise that, in recent years, deer have been identified as a local disease risk in some areas of the RoI (such as County Wicklow). However, there is little data to suggest that they act as a widespread reservoir of disease in NI.

We also recognise that camelids (llamas and alpacas) can be a reservoir of bTB but in NI the numbers of camelids are considered to be low, and they are not thought to be a significant cause of bTB spread.

The TBEP should keep the position in relation to both wild deer and camelids under review as additional information becomes available.



We have also considered the impact of other species, e.g. feral cats and rats, and see no epidemiological evidence to indicate that they are a significant factor in the spread of bTB here.

**Recommendation 4.1:** Regarding the role of other species in relation to bTB transmission, we recommend that the TBEP should keep the position in relation to wild deer and camelids under review.

It is accepted, however, that the badger population acts as a reservoir of bTB in the UK and the RoI. Removal of badgers has been shown to reduce disease in neighbouring cattle populations in both England and the RoI. In England, the Randomised Badger Culling Trials have shown that reducing the density of badgers can reduce the cattle breakdown risk.<sup>20</sup> Significantly, follow-up studies have shown that the initial impact on reduced cattle bTB levels within the removal areas has been maintained for up to five years after removal ended. In the RoI, a significant reduction in the prevalence of *M. bovis* infection over time has been observed in areas of culling, firstly in the Four Area Trial<sup>21</sup> and then later throughout the country, as part of the RoI national programme of targeted badger culling.

We also looked at the results of the NI Road Traffic Accident (RTA) survey in relation to badgers. That survey suggests that at least 17% of badgers in NI are infected with bTB, although it is likely that the rate would be higher if more detailed post mortems were undertaken. More information of the Badger RTA Survey is available on the DAERA website and in Annex 3.<sup>22</sup>

Having considered evidence from the RoI, NI and Great Britain, we believe it is conclusive that badgers as an acknowledged reservoir of the disease, are an important contributor to bTB infection in cattle. We also believe that any effective strategy to eradicate bTB in cattle must address the disease in badgers.

Further details of the evidence we considered is available in Annex 3.



## Vaccination

In the long term, a strategic programme of badger vaccination would significantly improve the disease situation in both badgers and cattle.

Vaccines are widely used to reduce the spread of disease in a population by stimulating the body's immune response. The principle of vaccination is to raise the immunity against bTB within the badger population which, over time, would reduce the severity of infection and reduce the opportunities for transmission between badgers and between badgers and cattle. However, we know that vaccination is not effective in animals that are already infected with bTB.

An injectable *Bacillus Calmette–Guérin* (BCG) based bTB badger vaccine has been licensed since 2010. We note that there is currently a worldwide shortage of the BCG vaccine. This has had an effect on supplies but work is currently under way to address the issue. We are pleased to note that research into an oral bait vaccine is ongoing and encourage DAERA to monitor this as it progresses. When an oral bait vaccine is available, the TBEP should consider how it could be deployed with most effect.

Given the current indicators of the level of infection in the badger population and the fact that vaccine is not effective in infected animals, we consider that vaccination alone would not achieve the desired effect within a reasonable timescale. However, the role it can play must be kept under active review as technologies develop and infection levels in badgers fall.

**Recommendation 4.2.1:** In the longer term, we recommend that badger vaccination should form part of a sustainable badger intervention strategy in support of an effective disease control strategy. This could be combined along with strategic removal of badgers or implemented as a stand alone intervention depending on the circumstances.

**Recommendation 4.2.2:** We recommend that, once an effective oral bait vaccine for badgers has been developed and is available, the TBEP should consider how it could most effectively be deployed. This widespread vaccination of badgers, deployed in suitable areas, would be an integral part of a sustainable and long term curtailment of bTB infection in badgers.

## Removal

We consider the culling of badgers would be required in order to reduce infection load and badger densities in particular areas before a vaccination programme in that area could be effective.

Evidence indicates that there may be a risk of increased disease levels associated with the removal of badgers from an area. This is called “the perturbation effect”. Following culling, there is a change in the organisation and territorial behaviour of badger populations, characterised by increased movement of badgers into and out of an area. This is termed

“social perturbation”. The perturbation hypothesis is an increase in bTB levels in badgers and/or cattle through increased contact patterns resulting from social perturbation. At this time, there is conflicting evidence about the impact of perturbation in the ROI and in England. We do not yet know if a perturbation effect would occur in NI. However, we have taken the possibility of a perturbation effect into account in our considerations and believe that it would be prudent to take precautionary actions to limit its potential effect were it to occur in NI.

A research project called the Test and Vaccinate or Remove (TVR) Wildlife Intervention Research project is ongoing. This study involves the testing of badgers, the vaccination and release of test negative badgers and the culling of test positive badgers. This is a five year research project and year three has just been completed. Reports on the first two years of the study have been published and are available on the DAERA website.<sup>23</sup> The practical experience gained from the TVR study to date shows that testing and vaccination or removal of badgers can be delivered in the field. There is, however, as yet, insufficient evidence to draw a conclusion on the overall value of TVR as an intervention approach in its own right. That said, we agree with the principle of TVR and have seen sufficient evidence to conclude that there would be merit in using a TVR approach as a means of mitigating any potential adverse perturbation effect around any intervention area.

We believe that DAERA needs to take action to address the risk of badger to cattle transmission as soon as possible, and in advance of the completion of the TVR research study. We have, therefore, developed our proposal in line with the evidence available to date. We consider, however, that any TVR evidence, alongside the results of any other local or international studies, should be used to inform the continual development of the badger intervention strategy.

It is hoped that farmers, in particular, would see such an intervention as a strong signal that Government is prepared to take a holistic and balanced approach to tackling bTB in badgers as well as in cattle, and that this should help to facilitate the change of culture we are trying to achieve.

**Recommendation 4.3:** We recommend that a badger control policy should be implemented to reduce the overall level of infection in the badger population.

This policy should be based on an agreed flexible process which could be used as appropriate in a particular area or set of circumstances.

The intervention should include the culling of badgers in areas of high levels of bTB in cattle and, in order to mitigate the risks associated with the perturbation effect, the vaccination of badgers, combined with culling of test positive badgers in a surrounding area. The diagram at Figure 6 illustrates our recommended approach.

After the multi-year programme of badger culling is completed, we also recommend that consideration be given to a further period of vaccination in the core zone. The TBEP should consider how this could best be delivered and make recommendations to DAERA.



We envisage that an intervention process, based on the principles outlined below, would be the way in which we would recommend implementing a badger control policy.

## Identification of an intervention area

We recommend that we (and in time the TBEP) would provide DAERA with an assessment of suitable locations for wildlife intervention.

The identification of areas for consideration would be based on an assessment of criteria, which might include factors such as:

- bTB incidence in the cattle population in the area;
- other potential causal factors;
- evidence of badger activity in the area; and
- evidence of bTB in the badger population.

These criteria should be reviewed regularly.

## Intervention areas identified – drawing boundaries

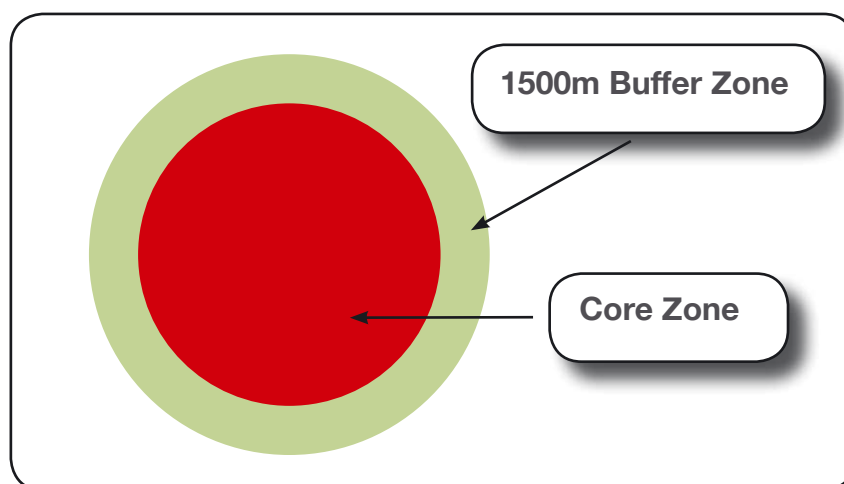
Once an area has been identified and selected for possible intervention, further evidence would be required. DAERA should, therefore, sample a number of badgers to ascertain whether bTB infection exists in the badger population in the area. If bTB infection is not confirmed in the badger population, no further intervention should be considered at that time. If bTB infection is confirmed in the badger population, DAERA should continue with implementation. The intervention area itself should be clearly identified and boundaries mapped.

The intervention area would comprise a central **core zone** surrounded by an outer **buffer zone** (Figure 6). It is recommended that, at least initially, the total intervention area(s) identified should be as large as possible - e.g. more than 100 sq. km (for illustrative purposes, a circle with a radius of 6km).

The **core zone** would form the central part of the intervention area (Figure 6). All badgers captured in the **core zone** should be dispatched by shooting whilst captured. The definition and size of the **core zone** would be determined by the local disease situation, the topography of the area and wildlife ecology. We believe that removal of all captured badgers in the core zone is necessary in order to rapidly reduce the level of bTB infection in the badger population.

Ideally the delineation of the intervention areas should take account of boundaries and barriers, such as major rivers, lakes, mountains or major roads which may inhibit or restrict badger movement.

Where such boundaries and barriers do not exist, a buffer zone of up to 1500 metres around the edge of the core zone area should be identified (Figure 6).



**Figure 6:** Schematic diagram of a badger intervention area

Badgers in the buffer zone should be captured, anaesthetised and tested using the pen side Dual Path Platform (DPP) test. If they test positive, they should be culled by lethal injection (as the badgers would already have been anaesthetised). All other badgers should be vaccinated with BCG, micro-chipped and released.

The purpose of this buffer zone would be to reduce any potential risk of a perturbation effect resulting from the culling of badgers in the core zone. It would also provide a population of more bTB resistant badgers, with a reduced level of infection, to facilitate the inevitable medium to long-term re-population of the core zone.

The process in the intervention area should be in two stages. The testing, culling or vaccination of badgers should commence in the buffer zone and once that has been completed, badger culling in the core zone should be carried out immediately afterwards. By designing the intervention in this way, any potential perturbation effect should be reduced.

This process, in both the buffer and the core zones, should be repeated annually for a minimum of 4 years. We believe that a minimum of a 4 year intervention would be necessary, based on the experiences in England and the RoI.

Having reduced the number of infected badgers in the intervention area through the badger cull policy, we consider that the remaining, and growing, badger population should be vaccinated in order to provide protection, with the anticipation that “herd immunity” effect would occur through time. We, therefore, recommend that consideration be given to following up the intervention with a programme of vaccination within the core area, lasting a minimum of 3 years. The length of time vaccination would be required for should be regularly reviewed.

Our approach has been supported by Professor Simon More, who peer reviewed our scientific evidence base. He has said;

“the approach proposed in the Review seems both reasonable and prudent. Using this approach an area suitable for vaccination will be achieved, whilst also reasonably mitigating against a potential adverse effect.”

## Road Traffic Accident Survey

We also recommend that the NI RTA survey should be further developed. The RTA survey has been in place since 1998. Badgers reported dead by members of the public are collected and submitted to the laboratory for post mortem inspection and tissue samples are cultured for *M. bovis*. The RTA survey is currently the only mechanism by which it is possible to obtain an estimate of the level of bTB infection in the NI badger population (notwithstanding the more detailed studies being carried out under the auspices of the localised TVR study).

Currently the sample numbers in the survey are approaching 300 badgers per year and this provides a reasonable estimate of NI prevalence but is not adequate to detect area/time variation unless the variation is particularly large. The RTA survey also acts as a form of 'hands off' comparative control for the TVR project, as well as providing data that can help investigations and identify other important epidemiological and ecological information in relation to bTB herd breakdowns. Monitoring of wildlife is costly but the RTA surveillance provides a cost effective method of doing this for *M. bovis* infection in badgers.

The RTA survey does not obtain uniform coverage across NI and it is recognised that the North-West is poorly represented in the number of badgers being collected for post mortem. It is necessary to provide a wider geographical coverage of RTA data and therefore a fuller picture of the spread of bTB in badgers. By expanding the RTA geographically and increasing the numbers examined, the RTA survey would provide a better estimate of prevalence of bTB in the badger population.

**Recommendation 4.4:** We recommend that the Road Traffic Accident (RTA) Survey should be expanded to have uniform coverage throughout NI the methodologies should be refined and the number of badgers sampled annually should be increased (to around 500) to provide a more reliable estimate of changes in prevalence in both time (inter-annual change) and space (changes between regions).

## Who should do this and when should it be done?

DAERA should lead on the badger control policy. We are aware that the badger is a protected species under NI legislation<sup>24</sup> and also internationally under the Bern Convention.<sup>25</sup> DAERA will need to take account of this in its implementation of any cull policy.

DAERA should work with the TBEP to help identify intervention areas. However, DAERA should then be responsible for the surveying and mapping of badger setts within those areas, obtaining the agreement of land owners, deployment of traps, testing of captured badgers and, if bTB test positive badgers are identified, culling badgers. Each intervention area should be reviewed regularly. The TBEP should provide advice to DAERA on the type and intervals of these reviews.

It is important that the badger control policy is adequately resourced and that methodologies are reviewed regularly to ensure that the intervention is carried out efficiently, effectively and humanely in every intervention area. We, therefore, recommend that the policy should be introduced in a phased way.

We recommend that initial interventions should start in two or three areas and be gradually rolled out year on year. This would allow expertise and experience to be developed and ensure that management processes are robust. Based on the mapping of current high incidence areas in NI, it is estimated that ultimately around ten areas would be targeted. The number and size of areas should be kept under review by DAERA and the TBEP.

The TBEP should have a role in monitoring and reviewing the wildlife intervention. This would facilitate refinement of the eradication programme; ensure that the impact on disease in both cattle and badgers is effectively monitored; enable consideration of issues as they emerge; and allow the eradication programme to take on board emerging findings.

DAERA should introduce the recommended enhancements to the RTA as soon as possible.



## 5. Herd Health Management



### Our Objective

To promote improved herd health management across all types of cattle holdings, slaughterhouses and at cattle markets, in order to reduce the risks associated with the spread of disease, and introduce actions and practices that will improve herd health.

### What is the issue?

Good herd health management:

- is a broad concept which involves identifying and controlling the particular animal health problems which might be relevant to an individual farm. It recognises that all farms are different but that, with appropriate attention to detail, farm efficiency can be increased and financial gains can be improved to the benefit of both the farmer and the animals;
- includes farm management aspects such as herd biosecurity, appropriate use of medicinal products to control internal parasites (such as Liver Fluke) and the containment or eradication of production diseases (such as Bovine Viral Diarrhoea (BVD), Johnes Disease, calf Pneumonia); and
- in each individual herd, provides a sound platform for the wide ranging measures contained in this Strategy, all aimed at the eventual eradication of bTB.

Biosecurity is an aspect of good herd health management and consists of three main elements:

- Bio exclusion – keeping disease out of any premises;
- Bio management – controlling disease once it gets into any premises; and
- Bio containment – stopping the spread of disease from/to any premises.

It is about operating a set of robust management practices designed to protect a holding, market or other place from the entry and spread of pests and disease. Good farm practices can reduce the risk of spreading disease by controlling the movement of animals, people, vehicles and equipment within those areas and, as a result, contain the movement of infectious micro-organisms.

We are aware, however, that herd health management in many livestock farms in NI is relatively poor; in part due to land fragmentation which increases potential disease exposure, but also due to animal movements which can involve substantial movement of infectious agents between, and within, holdings.

In addition, herd keepers may not have access to appropriate and relevant information on how best to exclude disease from the herd (advice tends to be generic and does not take account of individual farm size, the age of farm buildings or the farm layout) or they may prioritise other issues to address more immediate business and financial pressures.

We have heard that, within the farming community, there may be a level of scepticism about the merits of carrying out biosecurity measures while the wildlife issue remains to be comprehensively addressed.

Currently, bTB biosecurity training is being delivered through CAFRE to students as part of the animal health modules of all relevant courses. In addition, DAERA's information leaflets 'Biosecurity Measures Which Help Protect Your Herd Against TB'<sup>26</sup> and 'Wildlife Biosecurity'<sup>27</sup> are also disseminated to all attendees at CAFRE organised events at its Greenmount Campus.

Farmers also have online access to bTB advice on the DAERA website, and, in particular, farmers with a bTB breakdown receive a printed copy of DAERA's 'TB in your herd' booklet and bespoke advice from a Veterinary Officer during the course of any breakdown.

Despite this wide range of information sources, we have heard that DAERA delivered communication has limited impact in delivering key messages.

We acknowledge the potential positive impact of a new scheme around Business Development Groups (BDGs) within the Rural Development Programme (RDP) (2014-2020)<sup>28</sup>. As a vehicle for knowledge transfer, this scheme will use a group approach to improve the technical efficiency of farms by benchmarking businesses to identify areas that have the potential to be improved.

In addition, we acknowledge the commencement of work in respect of bTB biosecurity training which is also being rolled out under the Knowledge Transfer – Farm Family Key Skills measure of the RDP. The biosecurity training will be delivered by both DAERA Veterinary Officers and PVPs to all farmers participating in the BDGs. Farmers will also be able to apply for funding through the RDP Farm Business Improvement Scheme – Capital Grants for assistance in the provision of practical, on-farm biosecurity measures.

From our meetings with representative bodies of farmers, PVPs and with DAERA staff, we have been encouraged by the evidence of a genuine willingness to improve matters. We are also encouraged by the efforts of farmers to help themselves in recent years. As production diseases, such as BVD, are addressed and necessary steps are taken by farmers to prevent re-infection of their herds, this should also assist in the fight against bTB.

We believe that we cannot be complacent and every possible action must be taken to reduce all possibilities for the spread of disease within and between herds. An important vehicle to continuously improve knowledge transfer is through PVP and farmer engagement, and we have made specific recommendations in Chapter 1 Governance and Chapter 3 Tools and Processes.

In addition there is a need for new and innovative channels of communications to be considered. This is addressed in Chapter 2 Culture and Communication.



## Why is this important?

Biosecurity measures were thought to make a significant difference to the risk of introducing bTB infection according to the majority of farmers (67.7%) in the Agri Food and Bio Sciences Institute's (AFBI) Bovine Tuberculosis Biosecurity Study 2010-2011<sup>29</sup>.

We also know that good herd health management can substantially improve overall animal health on individual farms – not just in relation to bTB. Certain endemic diseases which currently exist on farms, such as BVD, can lower the resistance of cattle to other diseases, such as bTB, and it is considered that liver fluke can also reduce the reliability of the bTB skin test.

By improving herd health management generally, it is possible to break the cycle of disease spread, improve animal health and welfare generally, as well as improve production efficiency and business profitability.

As an example of how these factors can have an impact on disease in NI, bought-in animals have been identified by DAERA Veterinary Officers as the probable cause of bTB infection in around 14% of breakdowns in the period 2002-2015 (Bovine Tuberculosis in NI 2015 Annual Report<sup>30</sup>). Where practical, operating a closed herd policy will address this route of infection, although we recognise this approach cannot be deployed by all businesses here.

It is vital that we break the cycle of disease by reducing and eliminating, as far as possible, all sources of disease, whether the spread is from cattle to cattle, to or from wildlife, or via other known indirect sources.

We acknowledge that good herd health management alone would not lead to the eradication of bTB and we recognise that research into issues such as environmental factors is ongoing and may help identify further measures in the longer term.

However, we also consider that several small but effective improvements in farm management could have a cumulative positive effect on overall herd health.

Herd keepers should be encouraged to take responsibility for herd health on their individual holdings. This factor is relevant to other recommendations that we have made in the context of Culture and Communication Chapter 2. A good starting point would be some form of biosecurity self-assessment checklist that farmers could use and we believe that this would encourage their active engagement.

Depending on the nature of the enterprise, we recognise that the current involvement of PVPs in bTB control is often limited to bTB testing. This provides limited scope for them to engage meaningfully with herd keepers on the broader issues of how to reduce the risk of infection and where to identify areas for action and improvement. We believe that enhancing

that relationship, by encouraging PVPs to provide farm specific advice, would generate many benefits for both herd keepers and PVPs.

As we have already said, we are keen to develop a cultural change and encourage engagement. However, if the biosecurity aspects of better herd health management are not adopted voluntarily, the TBEP should, in the future, consider recommending the introduction of “Statutory Improvement Notices” to ensure farms with low standards are not allowed to pose an ongoing unacceptable disease risk to neighbours. In addition, further consideration may be given to relating both “non compliance” and “good practice” to compensation (see Chapter 6 Finance).

In addition, to ensure good biosecurity and reduce the risk of disease spread, thorough cleaning and disinfecting of equipment, vehicles, protective clothing and footwear before and after contact with farm animals is considered good practice. This is particularly important when animals have been transported from farm holdings to livestock markets or other holdings (and vice versa), or to abattoirs.

### **Informed Purchasing**

Farmers make significant financial investments when purchasing stock for their herd. Clearly, they want to ensure that they get the best value animal to improve their herd/business. A farmer will look at pedigree, performance, conformation etc, when purchasing an animal. They should, however, also be able to create an informed opinion of the potential health status of that animal, as supported by data on its test history.

We acknowledge that the latest test history of any particular animal would be no guarantee that the animal might not subsequently go down with bTB. It should, however, provide a potential purchaser with a more informed picture of the potential health status of that animal and so assist them in assessing the risks involved in completing the purchase. We recommend that industry should lead on an initiative to promote the adoption by farmers of an informed purchasing approach to bringing in stock to farms.

In our considerations, we were impressed with the New Zealand model<sup>31</sup> where herds are categorised (as C1-C10) depending on the length of time they have been free from bTB. We consider, however, that this mandatory approach is not currently feasible in NI because at current levels of bTB incidence it would disrupt the market for too high a proportion of farmers to be practical. It is something the TBEP should revisit, in discussion with industry, as the bTB Strategy unfolds and, most certainly, as disease incidence declines.

In the meantime, we recommend that livestock markets should be encouraged to display as much information as is practically and legally possible to help better inform prospective purchasers about any potential risk before they purchase cattle.

The successful implementation of these recommendations would require leadership from the industry to encourage and embed the adoption of such changes in buying practice.

We are conscious that direct farm-to-farm purchases also take place but even in respect of these transactions it should be possible, through awareness-raising and informed dialogue, for all parties to the transaction to determine and share the animal's bTB test history before purchase and transfer.

### **Livestock Markets**

It is also important that the risk of disease spread through livestock markets is reduced where possible. Every livestock market is different and poses different challenges. We wish to see DAERA working with those responsible for such markets to assess the risks associated with the structure and procedures in each market and so adapt them to reduce the chance of the markets themselves contributing to the spread of infection. This would include adequate cleaning facilities for animal transport.

### **Farm Fragmentation**

A farm unit may comprise land that is either owned or taken in conacre, some of which could be located a considerable distance from the home farm. In the event of a bTB breakdown, it is possible that cattle movements are taking place between such pockets of land, thereby increasing the risk of the spread of bTB to neighbouring herds. There are no centrally maintained records concerning such movements and this lack of information inhibits the identification of potential disease risk factors. Currently, there is also no formal mechanism that can be applied to reduce the risk of spread both within and between such land parcels.

We therefore recommend that a formal way to segregate high risk animals within a herd should be introduced. This could take the form of a notice served by DAERA staff specifying where animals must be kept, thereby limiting the potential for spread of disease within the herd or to neighbouring herds.

We also recommend that DAERA undertakes a review of existing farm fragmentation data to establish the extent to which the practice of farm fragmentation (including conacre) has an adverse impact on the control of disease following a bTB breakdown and whether proportionate risk mitigating measures can be developed. Whilst we have heard anecdotally about the possible impact on disease spread, we do not have any research in NI which examines the extent or significance of this.

### **Genetic Improvement**

Research has successfully identified a genetic variation within Holstein dairy cattle linked to the degree of resistance to bTB. That has led to a new TB genetic index called "TB Advantage" which was published in January 2016.<sup>32</sup> The index will help farmers breed dairy cows with genetic resistance to bTB. While breeding for resistance is unlikely to be a "silver bullet" in isolation, its use alongside other methods to control the disease will help towards eradication.

We therefore recommend that the farming industry encourage use of the “TB Advantage” index, and that the TBEP monitor further developments in this important research area.

## What do we think needs to be done?

**Recommendation 5.1:** We recommend that herd keepers should be proactively encouraged to improve herd health management and take responsibility for herd health management on individual holdings.

**Recommendation 5.2:** We recommend that, in the context of engraining the practice of good herd health management, farmers should use a biosecurity self-assessment check list to be developed by DAERA.

**Recommendation 5.3:** We recommend that Private Veterinary Practitioners (PVPs) and DAERA staff should provide advice to farmers about on-farm practice and herd health management measures specific to that farm and encourage farmers to make improvements to help reduce the risks associated with the spread of infectious diseases. The self-assessment checklist could be used as a starting point.

**Recommendation 5.4:** We recommend that system similar to Statutory ‘Improvement Notices’ should be given consideration by the TBEP and DAERA for use where it is apparent that good biosecurity practice is not being adopted voluntarily and a farm business is, as a result, posing a risk to others.

**Recommendation 5.5:** We recommend that the farming industry should lead in the adoption of an “informed purchasing” approach for farmers bringing in stock to their farms, i.e. only buying stock where the health status of the cattle is known.

**Recommendation 5.6:** To promote information, openness and transparency, we recommend that livestock markets should be encouraged to display as much information as is practically and legally possible to better inform prospective purchasers to help them assess the risks involved in any purchase.

**Recommendation 5.7:** We recommend that awareness-raising actions on “informed purchasing” should be put in place as an integral part of an overall communications strategy.

**Recommendation 5.8:** We recommend that DAERA undertakes a review of existing farm fragmentation data to establish whether the practice of farm fragmentation (including conacre) adversely impacts on the control of disease following a bTB breakdown.

**Recommendation 5.9:** We recommend that DAERA should introduce segregation notices to protect those herds that are at risk of disease spread from high risk groups within bTB breakdown herds.

**Recommendation 5.10:** We recommend that the TBEP should keep under review the potential benefits of the use of herd classification and purchasing based on herd bTB history as operated, for example, in New Zealand.

**Recommendation 5.11:** We recommend that industry leaders should actively encourage farmers to use the “TB Advantage” genetic index.

**Recommendation 5.12:** We recommend that farmers thoroughly clean and disinfect vehicles and equipment after transportation of farm animals.

## Who should do this and when should it be done?

DAERA should develop as soon as possible a biosecurity self-assessment checklist for use by farmers in a format that is user-friendly.

The delivery of specific advice to farmers by their PVPs should be part of new, and additional, contract arrangements between DAERA and PVPs and we have made specific recommendations regarding any new contract in Chapter 3 Tools and Processes. The advice itself should be developed by DAERA (with input from PVPs and industry representatives) in the short term e.g. 2017, ensuring that appropriate consideration is given to possible overlap with knowledge transfer schemes within the current RDP. The material that PVPs would draw on to allow them to provide the specific advice relevant to each farm's circumstances should be developed by DAERA (again with input from PVPs and industry representatives) with the aim of procuring the additional services and commencing delivery by 2018.

The farming industry and its representative organisations also have a key role to play in accepting the challenge to improve herd health management. We would wish to see those bodies support and encourage members to participate in seminars, training, engage with the advice of PVPs, pro-actively improve farm management security and adopt the use of the checklists.

We would also like to see the support of farmers in improving biosecurity on a voluntary basis. If this does not happen, consideration should be given to developing a more formal mechanism to achieve compliance. This could be in the form of Statutory Improvement Notices, i.e. a formal and legally enforceable notice to undertake specified improvements within a defined period.

Segregation notices and the procedures for their implementation should be developed by DAERA in consultation with the TBSPG and stakeholders with implementation expected in 2017.

## 6. Finance

### Our Objectives

To re-balance the cost of the disease between the public and private sectors, so encouraging a change of culture and attitude, and a shared commitment to the control and eradication of bTB. To identify new sustainable arrangements which would allow Government to maximise and better deploy resources.



### What is the issue?

We recognise that bTB is not just a disease which results in a frustrating regime of testing, reactor removal and movement restrictions, but is also a major on-going drain on both farm businesses and the public purse.

The annual cost of the bTB programme to tax payers is very significant, in excess of £27 million per year. In addition to the costs of testing, this figure includes between £12 and £16 million per annum paid to herd keepers as compensation for animals removed as part of bTB controls. We acknowledge that, whilst compensation is paid at 100% of an animal's value, this is not likely to cover some of the additional costs incurred (including, for example, the cost of rearing additional calves, the loss of earnings due to test impact on livestock feeding and the cost of additional labour and time to complete the tests) and the consequent impacts on farmers.

In order to assist us in finalising our recommendations, we secured the services of independent economic consultants to carry out a cost/benefit analysis of our proposals. As reflected elsewhere in the Strategy, we strongly believe that it is only by implementing our recommendations as a package that we can achieve eradication. For this reason, and because it is not possible to differentiate between the contribution of the individual recommendations, we requested a cost/benefit analysis of the Strategy as a single interrelated package of measures.

Details of the cost/benefit analysis undertaken by the independent consultants (PACEC) can be found in Annex 3. As can clearly be seen from the cost/benefit analysis the move towards eradication of the disease would bring substantial financial savings compared to the status quo remaining for the next 40 years. While full implementation of the recommendations would involve a significant investment, the long term savings to be made outweigh this, not to mention the large range of non-monetary benefits that eradication of the disease will bring.

In addition to appointing economic consultants, we separately appointed Dr. Philip Robinson, an independent social consultant, to assess our recommendations from a behavioural perspective. This work assisted us in assessing the likely impact of our recommendations on the attitudes and behaviours of key stakeholders. Details of this work can be found in Annex 3.

We are certain that continuing the current eradication programme would never achieve eradication: disease levels are broadly stagnant, fluctuating between 4.99% and 7.46% since



2011, with the resultant constant financial drain on Government and farmers. This would continue indefinitely unless there was a scientific breakthrough.

In contrast, by implementing our recommendations as a package of measures we can eradicate the disease. International experience has shown that it is very difficult to predict with any certainty the timescale within which implementation of the disease measures will lead to eradication. This can be affected by numerous factors. Broad estimates, however, (created by extrapolating from the data reflecting experience in the RoI) suggest that we could hope to achieve disease eradication within the next 3-4 decades. Further details of this are set out in the economic consultants report.

While clearly this will take time, as we move towards eradication, costs to both Government and farmers would fall and, in due course, eradication would not only result in significant savings to Government and farmers but it would also remove the impediment of bTB to the growth of the NI agricultural industry. Additionally there would be non-monetary benefits which would accrue to the mental health and well-being of affected farmers and the wider rural community.

### **Why is this important?**

This is important for different reasons. At present, the majority of the costs associated with eradicating bTB are met by Government. Not only is this unlikely to be sustainable, given the pressure on public finances, but it is vital that a better balance is struck between the financial contributions of Government and farmers in order to effect the culture change required to facilitate eradication.

Funding implementation of the Strategy may well prove to be a challenge for the NI Executive given the current financial climate. Political acceptance of the need to address bTB in a holistic way will be essential as there will be difficult choices to be made. We note that the former Department of Agriculture and Rural Development (DARD) consulted twice on proposals to introduce changes to the compensation arrangements but that these failed to win political support.

There needs to be a recognition across the political spectrum that investing in implementation of the Strategy would not only produce significant cost savings in the longer term but would also be central to maintaining our international trade status, which is likely to become more crucial in the post-Brexit environment.

Against this background, there is also a clear need for Government and stakeholders to work together to maximise and better deploy our resources, so ensuring sustainable arrangements which can enable eradication.

In determining what would help to deliver our stated objectives of culture change, shared ownership and maximising resources, we considered a range of options including introducing a levy, farmers paying for all or some bTB tests; and farmers paying directly for wildlife intervention. Further information on our consideration of options can be found in the

evidence papers listed at Annex 3. We concluded, however, that the most appropriate and effective method of delivering our objectives would be to amend the current compensation arrangements.

Difficulties arising from the current compensation arrangements were noted by the FVO following their audit in June 2015. The FVO report stated that:

*“..compensation scheme(s) in bTB eradication programmes should be subject to regular review and aimed at modifying the behaviour of the farmers in avoiding introduction and further spread of the disease”<sup>16</sup>*

Furthermore, the NI Assembly PAC made similar comments in their 2009 Report on the Control of bTB in NI:

“There were a number of cases where multiple compensation claims had been paid to the same herd owners. The Committee recognises that it can be difficult to eradicate bovine TB from herds but is concerned whether a 100 per cent compensation rate provides sufficient incentive for herd owners to prevent infection. In the Committee’s view, the cost of repeated disease breakdowns rests almost entirely with the taxpayer, and this cannot be right. In such cases, a share of the cost should be borne by the industry”<sup>33</sup>.

We have taken into consideration both the PAC and the FVO comments with regard to the impacts of DAERA’s policy of awarding compensation at full market value, and have compared our current compensation arrangements with those in other jurisdictions, see Table 3.

Table 3

TB Compensation Payments	
Country	Amount
<b>NI</b>	100% of market value for reactors and in-contact animals as determined by on-farm valuation. Pedigree stock at full valuation.
<b>England</b>	Use is made of statutory monthly table valuations which reflect the average sale prices over the last month (non-pedigree) or six months (pedigree) of bovine animals in fifty-one different categories. The categories are based on the animal's age, gender, type (dairy or beef) and status (pedigree or non-pedigree). The only exceptions are where insufficient market data results in categories without a set value and for buffalo and bison. The percentage of compensation may be reduced for TB reactor cattle that are disclosed in herds with overdue TB tests.
<b>Rol</b>	A maximum of €3,000 is paid for all cattle, except for one stock bull per year when a cap of €4,000 applies and a cap of €5,000 for a pedigree bull. Farmers pay for one herd test per year. They contribute via beef and milk levies to compensation costs.
<b>Wales</b>	As in NI, 100% of the market value is paid, but taking into account that: <ul style="list-style-type: none"> <li>• the salvage value of the animal will be paid if it is more than the market value; and</li> <li>• the highest amount of compensation that will be paid for a pedigree reactor is £15,000.</li> </ul> The Welsh Government is currently consulting on changes to their compensation regime.
<b>New Zealand</b>	Provision is made for all cattle that are removed to receive compensation of 65% of the market value, unless the farmer signs a waiver of compensation (which will generally only happen if the farmer wants to have the animal slaughtered urgently on farm). There is also an agreement by which dairy animals receive an additional payment up to 100% from Dairy NZ who cover the additional payments for herds and animals that come back as clear after the animal is slaughtered though infected dairy herds do not receive this top-up. There are also a number of herds that are deemed 'High Risk' which attract 100% compensation where a large percentage of them may require to be slaughtered.

## What do we think needs to be done?

### Compensation Cap

We consider that changes to the compensation arrangements would encourage a shift in culture and attitudes on the part of farmers. In particular, it would clearly signal, not only the continuing need for compensation to be viewed as a necessary part of the contract between Government and industry (to encourage support for compliance with the bTB Eradication Programme) but also that it could not continue to be an unlimited safety net to mitigate all financial risk. This was a view shared by Dr. Philip Robinson, in his behavioural analysis of our recommendations, where he stated:

*“It is to be hoped that a reduction in compensation will encourage farmers to do all in their power to reduce the risk of bTB entering and spreading within their herd through implementing appropriate biosecurity measures.”<sup>17</sup>*

In coming to a cap level, we have considered various options, and the likely impact on farmers. Looking at the compensation profile spend in 2015 for bTB, we examined and sought to balance the following information and factors:

- our wish to cap payments to contribute to a cultural and attitudinal change by encouraging a shared financial responsibility. If the cap level was set too high, any impact on culture and behaviours would be negligible. If the cap level was set too low, it may have a significant adverse impact on the farming industry, adversely affecting the chances of obtaining the necessary buy-in for the Strategy;
- the noted criticism from both the FVO and the NI Assembly PAC with regard to the levels of compensation paid and its effect;
- the existing burden on the taxpayer from the current bTB eradication programme and our awareness that the proposed new bTB eradication programme would result in significant additional expenditure, which would need to be resourced in part through some form of cost sharing;
- our aim that any savings from a reduced compensation bill should be redirected back into the eradication programme;
- our wish to address the small minority of farmers who seek to abuse the compensation system;
- the levels of payments made in previous financial years and the number of farmers that a range of cap levels would impact on; and
- the number of animals which would have been affected by a cap based on 2015 compensation profile.

### Non-pedigree animals

Taking all of these factors into consideration it is our judgement that setting a cap at £1,500 would have the most beneficial effect.

Table 4 below illustrates that in 2015 some 1,378 animals (13% of the total number of non-pedigree animals) would have been affected by a cap set at a level of £1,500.

**Table 4**

Total number of non-pedigree animals for which compensation was paid in 2015	Total number of non-pedigree animals for which compensation was paid in 2015 below the £1500 cap	Total number of non-pedigree animals for which compensation was paid in 2015 above the £1500 cap	Percentage of non-pedigree animals that would have been affected by a cap of £1500 in 2015
10,554	9,176	1,378	13%

## Pedigree Animals

Additionally, we considered how a cap would have affected the compensation of pedigree animals based on the 2015 compensation profile. This illustrated that, due to their often superior market value, any cap would have had a disproportionate impact on the amount of compensation awarded to pedigree animals. We also recognised that farmers in NI have invested in pedigree breeding to achieve high genetic merit for animals. In light of this, we have recommended that a 20% premium be awarded, above the level of the cap, for pedigree animals. Table 5 below illustrates that in 2015 some 711 pedigree animals (46% of the total number of pedigree animals) would have been affected by a cap set at £1,800.

We recommend that in all cases, valuations would continue to be determined by appointed valuers.

**Table 5**

Total number of pedigree animals for which compensation was paid in 2015	Total number of pedigree animals for which compensation was paid in 2015 below the £1,800 cap.	Total number of pedigree animals for which compensation was paid in 2015 above the £1,800 cap.	Percentage of pedigree animals that would have been affected by a cap of £1,800 in 2015.
1,544	833	711	46%

We also recommend that compensation up to a maximum of £3,500 should be payable for one pedigree stock bull per year, but with no carry-over from one year to the next. In setting this we sought to recognise the fact that the farming industry in NI has invested in pedigree breeding to improve commercial success. We have looked at the number of payments made in the previous 3 years which exceeded £3,500 and this represents a very small number.

**Recommendation 6.1:** We recommend that:

- a cap in compensation levels should be introduced with a maximum of £1,500 for non-pedigree bovine animals and a 20% premium for pedigree bovine animals (to a maximum of £1,800) (with all valuations being independently determined by appointed valuers); and
- a herd keeper should be permitted to receive compensation up to a cap of £3,500 for one pedigree stock bull per year, with no carry-over from one year to the next.

## Compensation reduction

We also consider that there is further benefit to revise the compensation arrangements and that farmers should be further incentivised to reduce all possible risks to their herd through a reduction in the percentage of compensation paid. This would also release further funds to be reinvested back into the eradication programme.

Applying a percentage reduction uniformly across all farmers, in addition to ensuring a contribution to cost sharing, would help to encourage changes to culture, attitude and behaviour by incentivising farmers to fully embrace the role they have in protecting their herd from bTB.

We therefore recommend that DAERA reduce the percentage of compensation paid to a level of 75% of market value, subject to the cap. This percentage reduction would be in addition to the introduction of capped payments.

For example, if a non-pedigree animal were valued at £1,600, the cap of £1,500 would be applied in the first instance. If a percentage reduction of, say, 25% was then also applied, the actual payment would be £1,125, i.e. 75% of the capped value of £1,500.

DAERA, along with the TBEP, should take into account the disease picture and other circumstances when seeking to introduce this measure. It should be noted that compensation payments were previously at 75% of market value.

It is our expectation that DAERA would use any savings accrued through the cap and any potential reduction in compensation payments to further enhance the bTB eradication programme.

**Recommendation 6.2:** We therefore further recommend that, in the future, the TBEP should consider a reduction in the percentage of compensation paid.

We are not, however, recommending that this should be introduced immediately. We recognise that in order to change culture, we will have to obtain stakeholder buy-in and secure “hearts and minds”. We, therefore, recommend that the cap on compensation be introduced first and its impact is reviewed before the TBEP considers introducing a percentage reduction in compensation paid.



## Who should do this and when should it be done?

The new arrangements would require legislative and system change which would have to be taken forward by DAERA. Implementation should be in the medium term and linked to progress on other key recommendations.

### Longer term proposals

It should also be recognised that, as disease levels progressively reduce in the longer term, consideration could be given to linking compensation with biosecurity. These issues should be formally reviewed by the TBEP in due course, and would be dependent on the evolving disease picture.

We recommend that this should only be considered in situations where it was proven that biosecurity advice and good practice had been ignored, thereby endangering the overall health of relevant herds.

This could be considered in terms of:

- paying compensation subject to a cap and percentage reduction, minus a proportionate penalty for poor biosecurity; or
- paying compensation subject to a cap and percentage reduction, plus a proportionate bonus for good biosecurity.

The changes outlined here, along with all other aspects of our Strategy, should be kept under regular review by the TBEP in light of the changing disease picture.

## 7. Research

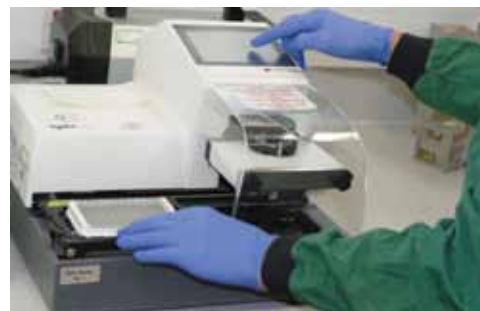
### Our Objectives

To ensure that research into bTB is given a priority within DAERA research agenda. To ensure that the TBEP has the ability to influence the bTB research agenda, is aware of emerging recommendations from research to inform future reviews of the Strategy and has a role in disseminating relevant research findings to stakeholders.



### What is the issue?

Research plays an important role in progressively informing the knowledge and evidence base required to inform both the development of policies for the eradication of bTB, as well as for farmers on how to protect their herds from the disease. Due to the complex nature of the disease, research into bTB can be expensive and sometimes inconclusive. However future research is key to ensuring that this Strategy is kept alive and relevant, taking account of new and relevant learning both locally and internationally.



We recognise that there are significant evidence gaps in relation to many issues with regard to bTB. This is done in line with the Department's Evidence and Innovation (E&I) strategy 2015-2017. We are aware that DAERA is also developing a new E&I Strategy which would adopt a longer-term strategic and programme based approach to commissioning research. We welcome the increased emphasis being placed by DAERA on the development of effective collaborations with other Government and industry funders so as to effectively expand the research capacity available to DAERA and the agri-food and wider rural sectors.

The evidence and innovation needs of DAERA are currently delivered through the commissioning of policy and industry relevant research through:

- the DAERA-directed AFBI research and development programme;
- DAERA Postgraduate Studentship Scheme;
- industry-led DAERA Research Challenge Fund; and
- DAERA Collaborative Research Programme.

### Why is this important?

Our main objective is to ensure that our approach to bTB eradication is science-led and utilises available robust evidence to eradicate bTB in the cattle population in NI. We also wish to ensure that there is a mechanism for stakeholders to influence the commissioning of relevant research and also through which they can be informed of findings from such work in a timely manner. We welcome the investment DAERA has made, and continues to make, in bTB research. Evidence and innovation gaps remain, and work to address these will benefit from the proposed move by DAERA to a longer-term programme of bTB research. However, it is

important that sufficient flexibility is built into the programme to facilitate changes in priorities, as necessary.

## What do we think needs to be done?

It is our view that DAERA must continue to invest in bTB as a research priority and continue to help to advance the ability to detect and eradicate bTB while communicating scientific developments to all relevant stakeholders, as well as the science community. Consideration needs to be given to the most effective processes by which new research information can feed into the proposed new governance arrangements for bTB in order to inform development of the Strategy and future research requirements.

We believe that the TBEP should be involved at all stages of DAERA's processes for identifying evidence gaps and meeting innovation needs through research and development. This includes being involved in the commissioning process as well as the evaluation and review of research projects. This would:

- provide the TBEP with the opportunity to influence the research agenda, ensuring that bTB would be given the relevant priority within the DAERA research programme;
- enable the TBEP to be aware of ongoing research projects and help to inform decisions about reprioritisation, as necessary;
- ensure the TBEP has early access to information would allow the TBEP to have the most up-to-date information to inform the regular review of the Strategy; and
- enable the TBEP to assist researchers and DAERA to disseminate information in a relevant and timely way to stakeholders.

We therefore support the proposals that DAERA is developing for integrated programmes of research with continued emphasis on fostering collaboration and co-operation between organisations in the delivery of research. A programme working group model consisting of representatives of DAERA, research providers and stakeholders, including the TBEP, would provide an effective mechanism for overseeing the programme of work and ensure that the TBEP has access to emerging research findings to ensure that future strategic reviews are based on the best and most up-to-date information.

**Recommendation 7.1:** We recommend that DAERA continue to invest in bTB research to facilitate future policy development and new innovations to help tackle the disease.

**Recommendation 7.2:** We recommend that the TBEP is recognised as a significant stakeholder in the research agenda and is able to input into the identification of gaps and the research commissioning process.

**Recommendation 7.3** We recommend that a representative(s) from the TBEP sit on the steering group which will oversee the proposed new programme of bTB research. This would ensure that the TBEP has access to emerging research findings to ensure that future strategic reviews were based on best and most up to date evidence and would have a role in the dissemination of relevant research to stakeholders.

We welcome the fact that DAERA has introduced a Knowledge Hub which carries a summary of ongoing and completed projects, but also consider that it could be further developed to facilitate early adoption of research findings by stakeholders. We look forward to seeing it being further enhanced.

In addition to specific pieces of research identified as necessary to support the recommendations in other Chapters of this Strategy (e.g. recommendations for further research in relation to farm fragmentation), we feel that there are additional areas for research which should be considered at the earliest opportunity. In our deliberations, we identified a number of areas which we feel are of importance moving forward. In particular we consider:

- that it is essential that DAERA continues to research the epidemiology of bTB;
- that livestock genetics can make a significant contribution to animal health (including resistance to bTB (See Chapter 5 Herd Health Management) and other infectious diseases) and further work in this area should be taken forward;
- that DAERA should utilise improved diagnostic tests and its future research should focus on improved accuracy, timeliness and cost; and
- that DAERA should also invest in research on the development of bTB vaccines for wildlife.

Furthermore, we note with interest the ongoing TVR project which is due to complete fieldwork in 2018. Any verified results or findings will be of interest to both DAERA and the TBEP as this Strategy is progressed. It is essential that DAERA should also have access to a dedicated veterinary epidemiologist supporting this project and the other aspects of bTB research within the eradication programme.

### **Who is going to do this and when should it be done?**

DAERA should implement a new research model which would complement and assist the new governance structures that we have recommended as soon as possible.

DAERA should continue to prioritise research, particularly in relation to bTB, when budgetary decisions are being made.

## Implementation Plan

## Section C

		Timescale key Short (S) - Within 12 months Medium (M) - Within 1-2 years Long (L) - Beyond 2 years		
Reference	Recommendation	Lead body	Other actors	Timescale to introduce <sup>1</sup>
<b>1 Governance</b>				
1.1	We recommend that a new governance structure should be put in place, with the establishment of: <ul style="list-style-type: none"> <li>• A Northern Ireland level oversight body, the TB Eradication Partnership (TBEP)</li> <li>• A small number of Regional Eradication Partnerships (REPs) and;</li> <li>• Responsive local Disease Response Teams (DRTs).</li> </ul>	DAERA	CPANI TBSPG/ TBEP Industry	S
<b>2 Culture &amp; Communication</b>				
2.1	We recommend that a vigorous publicity, communication and knowledge transfer plan should be developed by the TBEP and implemented in conjunction with key stakeholders.	All stakeholders		S
<b>3 Tools &amp; Processes</b>				
<b>1 – Improved surveillance</b>				
3.1.1	We recommend that DAERA ensures that optimum levels of test sensitivity are achieved through robust training, management and monitoring of all testing vets. We are pleased to see that DAERA has appointed a contract manager for this purpose and recommend that the results of the monitoring are regularly provided to the TBEP.	DAERA PVPs	AHWNI CAFRE TBEP	S

3.1.2	<p>We recommend this important aspect of disease surveillance must be as rigorous as possible and uniformly applied across all NI slaughterhouses. We agree with the approach being taken by DAERA and recommend that it continues to monitor the surveillance outcomes.</p>	Industry DAERA		M
<b>2 – Improved management of bTB infected herds</b>				
3.2.1	<p>We recommend that DAERA expand its use of severe interpretation during breakdowns in “Officially Tuberculosis Free Status Withdrawn (OTW)” herds to require the removal of all animals that are inconclusive on standard interpretation of the skin test.</p> <p>We also recommend that DAERA should undertake further epidemiological analysis to assess the potential for wider use of severe interpretation of the skin test.</p>	DAERA PVPs		S/M
3.2.2	<p>We recommend that the use of the Gamma Interferon (IFNG) test is expanded to remove infected animals as quickly as possible.</p> <p>In particular, we recommend that DAERA makes it compulsory for:</p> <ul style="list-style-type: none"> <li>(i) herd keepers to have the test if the Department considers it necessary; and</li> <li>(ii) for all animals positive to the gamma interferon test to be removed.</li> </ul>	DAERA PVPs	AFBI	S/M



<p>3.2.3</p>	<p>We recommend that ‘chronic herds’ should be recognised as a distinct entity for action.</p> <p>We also recommend that there should be a renewed approach to dealing with chronic herds. This should involve using relevant measures and processes, already identified, in a package targeted at resolving or minimising their impact.</p> <p>The TBEP and DAERA should continuously monitor ongoing research into chronic herds to better focus current, and develop new, approaches to dealing with them.</p>	<p>DAERA</p>		<p>M/L</p>
<p>3.2.4</p>	<p>We strongly recommend that DAERA should move to prevent restocking of all breakdown herds until after the first herd re-test (and subsequent removal of any reactors).</p> <p>(i) We recommend that, in the medium term, DAERA should prevent restocking of herds that do not test clear at the first retest (subject to epidemiological assessment).</p> <p>(ii) In the longer term, we recommend that the TBEP should consider whether it would be beneficial to require a negative full herd test, before allowing movement onto a farm following any disclosure episode (herds that are OTS and OTW) and further prevent restocking of herds (subject to an epidemiological assessment).</p>	<p>DAERA</p>		<p>S/M</p>
		<p>TBEP</p>	<p>DAERA</p>	<p>L</p>
<p>3.2.5</p>	<p>We recommend that a herd with two or more Non Visible Lesions (NVL) reactors should have its Officially Tuberculosis Free (OTF) status withdrawn (OTW) and should require two consecutive clear herd skin tests at least 60 days apart to regain OTF status. Tracing and checking of epidemiologically related herds should also be carried out.</p>	<p>DAERA</p>		<p>S</p>

3.2.6	We recommend that DAERA consider permitting limited moves from bTB breakdown herds to approved rearing/finishing herds which are 100% housed and meet strict biosecurity conditions.	DAERA		L
3.2.7	We recommend that DAERA consider that in higher risk breakdowns, a further herd test should be carried out 6 months after the Check Herd Test (CHT).	DAERA PVPs		S
3.2.8	We recommend that, in addition to the application of measures to improve test sensitivity, the benefits of depopulation as a control measure should be positively considered in herds with multiple reactors. Partial depopulation should be particularly considered in herds where the reactors represent a significant proportion of a particular group.	DAERA		S
<b>3 – bTB programme integrity and additional control measures</b>				
3.3.1	We recommend that Private Veterinary Practitioners (PVPs) should apply DNA tags to any animals that they detect with reactor readings when they are reading test results.	DAERA PVPs		M
3.3.2	We recommend that DAERA develops a preliminary field trial and associated research to help establish counter measures to prevent occurrences of cattle being presented as reactors for slaughter which have not given a natural response to the injection of tuberculin.	DAERA	PVPs	S
<b>4 - Additional decision making support</b>				
3.4.1	We recommend that the Geographical Information System (GIS) is further developed as a resource to meet the requirements of DAERA staff, PVPs and the governance groups as the Strategy evolves.	DAERA		S/M

3.4.2	We recommend that the use of molecular techniques should be expanded as we seek to eliminate bTB from our cattle.	DAERA TBEP	AFBI	M
<b>4 Wildlife</b>				
4.1	Regarding the role of other species in relation to bTB transmission, we recommend that the TBEP should keep the position in relation to wild deer and camelids under review.	TBEP DAERA		S
4.2.1	In the longer term, we recommend that badger vaccination should form part of a sustainable badger intervention strategy in support of an effective disease control strategy. This could be combined along with strategic removal of badgers or implemented as a stand alone intervention depending on the circumstances.	TBEP DAERA	AFBI	M/L
4.2.2	We recommend that, once an effective oral bait vaccine for badgers has been developed and is available, the TBEP should consider how it could most effectively be deployed. This widespread vaccination of badgers, deployed in suitable areas, would be an integral part of a sustainable and long term curtailment of bTB infection in badgers.	TBEP DAERA	AFBI	L

<p>4.3</p>	<p>We recommend that a badger control policy should be implemented to reduce the overall level of infection in the badger population.</p> <p>This policy should be based on an agreed flexible process which could be used as appropriate in a particular area or set of circumstances.</p> <p>The intervention should include the culling of badgers in areas of high levels of bTB in cattle and, in order to mitigate the risks associated with the perturbation effect, the vaccination of badgers, combined with culling of test positive badgers in a surrounding area.</p> <p>After the multi-year programme of badger culling is completed, we also recommend that consideration be given to a further period of vaccination in the core zone. The TBEP should consider how this could best be delivered and make recommendations to DAERA.</p>	<p>TBEP DAERA</p>		<p>S/M</p>
<p>4.4</p>	<p>We recommend that the Road Traffic Accident (RTA) Survey should be expanded to have uniform coverage throughout NI the methodologies should be refined and the number of badgers sampled annually should be increased (to around 500) to provide a more reliable estimate of changes in prevalence in both time (inter-annual change) and space (changes between regions).</p>	<p>DAERA</p>		<p>M</p>

5 Herd Health Management				
5.1	We recommend that herd keepers should be proactively encouraged to improve herd health management and take responsibility for herd health management on individual holdings.	INDUSTRY PVPs DAERA		S
5.2	We recommend that, in the context of engraining the practice of good herd health management, farmers should use a biosecurity self-assessment checklist to be developed by DAERA.	INDUSTRY PVPs DAERA		S
5.3	We recommend that PVPs and DAERA staff should provide advice to farmers about on-farm practice and herd health management measures specific to that farm and encourage farmers to make improvements to help reduce the risks associated with the spread of infectious diseases. A self-assessment checklist could be developed and used as a starting point.	INDUSTRY PVPs DAERA	AHWNI CAFRE TBSPG/ TBEP	S
5.4	We recommend that a system similar to statutory 'Improvement Notices' should be given consideration by TBEP and DAERA if it is apparent that positive herd health management is not being adopted voluntarily and a farm business is as a result, posing a risk to others.	TBEP DAERA	PVPs	S
5.5	We recommend that the farming industry should promote the adoption of an 'informed purchasing' approach for farmers bringing in stock to their farms, i.e. only buying stock where the health status of the cattle is known.	INDUSTRY	TBEP DAERA AHWNI	M/L

5.6	To promote information, openness and transparency, we recommend that livestock markets should be encouraged to display as much information as is practically and legally possible to better inform prospective purchasers to help them assess the risks involved in any purchase.	INDUSTRY	TBEP	M/L
5.7	We recommend that awareness raising actions on “informed purchasing” should be put in place as an integral part of an overall communications strategy.	TBEP DAERA INDUSTRY		S/M
5.8	We recommend that DAERA undertakes a review of existing farm fragmentation data to establish whether the practice of farm fragmentation (including conacre) adversely impacts on the control of disease following a bTB breakdown.	DAERA	AFBI	M
5.9	We recommend that DAERA should introduce segregation notices to protect those herds that are at risk of disease spread from high risk groups within bTB breakdown herds.	DAERA	PVPs	S
5.10	We recommend that the TBEP should keep under review the potential benefits of the use of herd classification and purchasing based on herd bTB history as operated, for example, in New Zealand.	TBEP	DAERA	M/L
5.11	We recommend that industry leaders should actively encourage farmers to use the “TB Advantage” genetic index.	INDUSTRY		S/M
5.12	We recommend that farmers thoroughly clean and disinfect vehicles and equipment after transportation of farm animals.	INDUSTRY		S/M



6 Finance				
6.1	We recommend that: <ul style="list-style-type: none"> <li>• a cap in compensation levels should be introduced with a maximum of £1,500 for non pedigree bovine animals and a 20% premium for pedigree bovine animals (to a maximum of £1,800), (with all valuations being independently determined by appointed valuers) and</li> <li>• a herd keeper should be permitted to receive compensation up to a cap of £3,500 for one pedigree stock bull per year, with no carry-over from one year to the next.</li> </ul>	DAERA	TBEP	M
6.2	We further recommend that, in the future, TBEP should consider a reduction in the percentage of compensation paid.	TBEP	DAERA	L
7 Research				
7.1	We recommend that DAERA continue to invest in bTB research to facilitate future policy development and new innovations to help tackle the disease.	DAERA	AFBI	S
7.2	We recommend that the TBEP is recognised as a significant stakeholder in the research agenda and is able to input into the identification of gaps and the research commissioning process.	TBEP DAERA AFBI		S
7.3	We recommend that a representative(s) from the TBEP sits on the steering group which would oversee the proposed new programme of bTB research. This would ensure that TBEP had access to emerging research findings to ensure that future strategic reviews were based on best and most up to date evidence and would have a role in the dissemination of relevant research to stakeholders.	TBEP DAERA	AFBI	S
<sup>1</sup> start date of actions inc commencing consultation/legislative changes - not necessarily date of the implementation of the measures.				

# TBSPG Membership

## Annex 1



**Mr Sean Hogan**  
**Chairman**  
**MSSc, FioD, FCMI, FLNstSMM (Ret)**

Sean Hogan is the Chair of the TBSPG, a Social Scientist, he is currently a Board member of Ervia (parent company of Irish Water and Gas Networks Ireland) a former Chairman of NI Water Ltd. Previously he was Chairman for the Centre for Advanced Sustainable Energy at Queens University Belfast, and formerly the Chairman of the Agri-Food and Biosciences Institute from April 2006 to March 2014. He has also previously been the Chairman of the Newry and Mourne Health and Social Services Trust, the Education & Skills

Authority, a NED with Translink/NITHCo and Warrenpoint Harbour Authority. He is a Voluntary Board Member for the registered charity Sentinus and a Voluntary Advisory Board Member for the Chartered Institute for Public Finance and Accounting and Chairman of Newry Credit Union.



**Dr. George McIlroy**  
**MVB, MSc, PhD, MRCVS, FIFST, FioD, FinstLM**

Dr. George McIlroy is a Veterinarian with over 40 years experience working in Public & Private sectors. He has been a Board Member of the NI Fishery Harbour Authority since April 2012, where he is Chair of the Stakeholder Committees for NI's three fishing ports. He has been a Trustee and Board Member of the National Museums NI since December 2013 and is also a Board Member of the Western Health and Social Care Trust since December 2015. He is a former Chief Executive and Accounting Officer of the Agri-Food and Biosciences Institute, a former Chief Scientific Officer/Deputy

Secretary and Deputy Chief Veterinary Officer, responsible for Veterinary Policy, in DARD. Previously, he was Head of Epidemiology at the Veterinary Science Laboratory, Stormont where he was awarded a PhD on the epidemiology of bovine tuberculosis by Queens University Belfast. Dr. McIlroy also has ten years experience working on Boards in the private sector, as Group Veterinary/Technical Director of two large international companies in the Agri-food Industry. He volunteers as a member of Board Committees of the Institute of Food Science and Technology and with the international charity Tearfund.



**Dr. Cecil McMurray**  
**C.B.E. (FRSC, FIFST, PhD, BSc, Bagr, C Chem)**

Dr. Cecil McMurray C.B.E has been a Member of the NI Food Chain Certification (NIFCC) Committee since February 2003 and a Member of the Agri-Food and Biosciences Institute (AFBI) Board since March 2012. He has been the MD of Sci Tec Consultancy since July 2003, providing consultancy advice locally and internationally, including to the European Commission and World Bank. Until December 2013 he was the Chair of

Defra's TB Diagnostic Advisory Group and also a Member of Defra's Bovine TB Scientific Advisory Body. He is a former Chief Scientific Officer for DARD/DANI, where he also held senior veterinary research positions. He is a former Head of the Food and Agriculture Chemistry Department in the Faculty of Agriculture at Queen's University. He has held research positions at Harvard University and the University of Bristol, and was a Member of the Governing Body of the Rowett Research Institute in Aberdeen. He was also a Member of the Management Board responsible for the establishment and early management of NI Co-operation Overseas (NI-CO). He is an Honorary Member of the NI Veterinary Association. In 2002 he received a C.B.E. for Public Service.



**Mr John Thompson**

Mr John Thompson has been the Chairman of Animal Health and Welfare NI (AHWNI) since its launch in September 2012. He is an honorary member of the British Veterinary Association NI Branch. He has been a Member of the Agri-Food Strategy Board (AFSB) since 2012, also chairing the Arable and Horticulture Sub-Group. He has been a member of the NFU Mutual NI Advisory Board since 2007, becoming Chairman in 2014. He has been a board member of Rural Support since 2012 and was the inaugural Chair of Open Farm Weekend. He's a former President and

Deputy President of the Ulster Farmer Union. Mr Thompson is also a dairy farmer.



**Mr Campbell Tweed O.B.E.**

Mr Campbell Tweed O.B.E. has been a Non-Executive Member of the Management Board of Harper Adams University since 2012, and is a Member of its Audit Committee. He has been a Non-Executive Member of the National Trust's NI Regional Board since 2014. He is Chairman of the National Sheep Association in NI. He is a former President and Deputy President of the Ulster Farmer's Union, and has also previously served as Director of the Oxford Farming Conference and Chair of the Historic Monuments Council. He is the Director of the National Fallen Stock Company and a member of the BBC Rural Affairs and Agriculture Committee. Mr Tweed is also a livestock farmer, specialising in lamb and beef production. In 2003 he received an O.B.E. for services to the environment and the protection of historic monuments. Has also been UK and International Chairman of Nuffield Farming Scholarship Trust.

**Ex-officio members**

Director, Animal Health and Welfare  
Chief Veterinary Officer

# Details on TBSPG Interim Report and Consultation Summary

## Annex 2

### Interim Report of June 2015

- 1.1 In its initial Public Consultation of December 2014, the TBSPG sought views from all parties who had an interest in bTB eradication and asked how they considered it would be possible to reduce:
  - the incidence of bTB in cattle;
  - its impact on the farming industry; and
  - the cost of the eradication programme.
- 1.2 In its subsequent Interim Report of June 2015, the TBSPG presented the results of its initial consultation as informed by subsequent related evidence gathering and meetings with industry stakeholders, representative organisations and veterinary and scientific experts.
- 1.3 Next, in its allied public consultation on its Interim Report over the summer months of 2015, the TBSPG sought views on the most efficient and pragmatic actions required to achieve the greatest reduction in the level and cost of bTB in the shortest possible time.
- 1.4 The consultation ran from 30 June to 4 September 2015 and replies were sought to a range of questions under the thematic categories.
- 1.5 There was a total of 28 respondents, of which:
  - 6 were on the part of the farming industry's representative bodies;
  - 6 were on the part of conservationists and nature conservationists;
  - 9 were on the part of the veterinarian representative organisations, other veterinarians and the Agri-Food and Biosciences Institute (AFBI); and
  - 7 were private individuals.
- 1.6 The responses were analysed and categorised under the thematic categories, with most respondents providing comments on more than one thematic category.
- 1.7 All responses were reviewed by the TBSPG in September and October 2015. The Interim Report and a more detailed overview of the main points and suggestions made under the thematic categories by the respondents by sector is available online at [www.daera-ni.gov.uk/tbsp-g-btb-eradication-strategy-ni](http://www.daera-ni.gov.uk/tbsp-g-btb-eradication-strategy-ni)

# Link to Background Thinking Papers, Reference Papers and Documentation and Independent Analysis of Recommendations.

All Background Thinking Papers as well as reference papers and documentation that have been considered as part of this Strategy are listed below along with the reports from independent consultants. The documents can be found at [www.daera-ni.gov.uk/tbsp-g-btb-eradication-strategy-ni](http://www.daera-ni.gov.uk/tbsp-g-btb-eradication-strategy-ni)

Background Thinking Papers by theme:

- Governance
- Culture and Communication
- Tools and Processes
- Wildlife
- Herd Health Management
- Finance
- Research

List of reference papers and documentation

TBSPG Interim Report

Summary of Consultation responses to the TBSPG Interim report

Independent Analysis of recommendations

- Scientific Appraisal of the TBSPG Recommendations Doctor Cecil McMurray and Doctor George McIlroy
- Peer review of Scientific Appraisal Professor Simon More UCD
- Behavioural Analysis of the TBSPG Recommendations Doctor Philip Robinson Harper Adams University
- Economic Appraisal of the TBSPG Recommendations PACEC (Public and Corporate Economic Consultants)



## Glossary of Terms

## Annex 4

Term	Explanation
<b>AERA Committee</b>	NI Assembly Committee for Agriculture, Environment and Rural Affairs
<b>AFBI</b>	Agri Food and Bio Sciences Institute
<b>AHWNI</b>	Animal Health & Welfare NI
<b>AHWSF</b>	Animal Health & Welfare Stakeholders Forum
<b>ARD Committee</b>	NI Assembly Committee for Agriculture and Rural Development
<b>BCG vaccine</b>	Bacillus Calmette–Guérin (BCG) vaccine is a vaccine primarily used against tuberculosis.
<b>BDG</b>	Business Development Groups
<b>bTB</b>	Bovine Tuberculosis
<b>BVD</b>	Bovine Viral Diarrhoea
<b>CAFRE</b>	College of Agriculture, Food and Rural Enterprise
<b>CHT</b>	Check Herd Test
<b>Conacre</b>	The subletting for a single season of small portions of a farm
<b>CPANI</b>	Commissioner for Public Appointments NI
<b>CVO</b>	Chief Veterinary Officer
<b>DAERA</b>	Department of Agriculture Environment and Rural Affairs
<b>DPP</b>	Dual Path Platform
<b>DRT</b>	Disease Response Team
<b>DVO</b>	Divisional Veterinary Office(r)
<b>E&amp;I</b>	Evidence and Innovation
<b>Epidemiologist</b>	Scientist that studies the patterns, causes, and effects of health and disease conditions in defined populations
<b>EU</b>	European Union
<b>FVO</b>	Food and Veterinary Office (within European Union)
<b>GIS</b>	Geographical Information System

Term	Explanation
<b>IFNG</b>	Gamma Interferon Test carried out on a blood sample
<b>LMC</b>	Livestock and Meat Commission NI
<b>M.bovis</b>	Mycobacterium bovis
<b>NI</b>	Northern Ireland
<b>NIMEA</b>	Northern Ireland Meat Exporters Association
<b>NVLs</b>	Non visible lesions
<b>OIE</b>	World Animal Health Organisation
<b>OTF</b>	Officially Tuberculosis free
<b>OTS</b>	Officially Tuberculosis free status suspended
<b>OTW</b>	Officially Tuberculosis free status withdrawn
<b>PAC</b>	NI Assembly Public Accounts Committee
<b>PVP</b>	Private Veterinary Practitioner
<b>RDP</b>	Rural Development Programme
<b>RTA</b>	Road Traffic Accident
<b>SICCT (skin test)</b>	Single Intradermal Comparative Cervical Tuberculin test – “the skin test”
<b>Reactor Animal</b>	An animal that gives a positive response to the skin test
<b>REP</b>	Regional Eradication Partnerships
<b>RoI</b>	Republic of Ireland
<b>TBEP</b>	Tuberculosis Eradication Partnership
<b>TBSPG</b>	Tuberculosis Strategic Partnership Group
<b>The Minister</b>	The Minister for the Department of Agriculture, Environment and Rural Affairs
<b>TVR</b>	Test and Vaccinate or Remove study
<b>UFU</b>	Ulster Farmers Union
<b>VEU</b>	Veterinary Epidemiology Unit (DAERA)
<b>VNTR</b>	Variable Number Tandem Repeats

## Endnotes

## Annex 5

Endnote Number	Reference
1	Agri-Food Strategy Board (2013) <i>Going For Growth A Strategic Action Plan In Support Of The Northern Ireland Agri-Food Industry</i> [Online], Belfast, The Agri-Food Strategy Board. Available at <a href="http://www.agrifoodstrategyboard.org.uk/uploads/Going%20for%20Growth%20-%20Web%20Version.PDF">http://www.agrifoodstrategyboard.org.uk/uploads/Going%20for%20Growth%20-%20Web%20Version.PDF</a> (Accessed 24/11/2016)
2	TB Strategic Partnership Group (2015) <i>TB Strategic Partnership Group Interim Report A Consultation</i> [Online], Belfast, Department of Agriculture, Environment and Rural Affairs. Available at: <a href="http://www.daera-ni.gov.uk/sites/default/files/consultations/dard/tbspag-interim-report.pdf">http://www.daera-ni.gov.uk/sites/default/files/consultations/dard/tbspag-interim-report.pdf</a> (Accessed 25/11/2016)
3	TB Strategic Partnership Group (2016) <i>TB Strategic Partnership Group Bovine TB Eradication Strategy for Northern Ireland</i> [Online], Belfast, Department of Agriculture, Environment and Rural Affairs. Available at: <a href="http://www.daera-ni.gov.uk/tbspag-btb-eradication-strategy-ni">http://www.daera-ni.gov.uk/tbspag-btb-eradication-strategy-ni</a>
4	European Commission Health & Consumer Protection Directorate-General (2013) <i>Working Document on Eradication of Bovine Tuberculosis in the EU Accepted by the Bovine tuberculosis subgroup of the Task Force on monitoring animal disease eradication</i> [Online], Brussels, European Commission. Available at <a href="https://ec.europa.eu/food/sites/food/files/animals/docs/diseases_erad_tb_workingdoc2006_en.pdf">https://ec.europa.eu/food/sites/food/files/animals/docs/diseases_erad_tb_workingdoc2006_en.pdf</a> (Accessed 24/11/2016)
5	European Commission (2014) <i>Factsheet on 2014-2020 Rural Development Programme for Northern Ireland</i> [Online], Brussels, European Commission. Available at: <a href="http://ec.europa.eu/agriculture/rural-development-2014-2020/country-files/uk/factsheet-northern-ireland_en.pdf">http://ec.europa.eu/agriculture/rural-development-2014-2020/country-files/uk/factsheet-northern-ireland_en.pdf</a> (Accessed 24/11/2016)
6	Department of Agriculture and Rural Development, Policy and Economics Division (2016) <i>The Agricultural Census in Northern Ireland Results for June 2015</i> [Online], Belfast, Department of Agriculture and Rural Development. Available at: <a href="https://www.daera-ni.gov.uk/sites/default/files/publications/dard/agricultural-census-ni-june-2015.pdf">https://www.daera-ni.gov.uk/sites/default/files/publications/dard/agricultural-census-ni-june-2015.pdf</a> (Accessed 24/11/2016)
7	Department of Agriculture and Rural Development Policy and Economics Division (2016) <i>Statistical Review of Northern Ireland Agriculture 2015</i> [Online], Belfast, Department of Agriculture and Rural Development. Available at: <a href="https://www.daera-ni.gov.uk/sites/default/files/publications/dard/stats-review-2015-final-amended.PDF">https://www.daera-ni.gov.uk/sites/default/files/publications/dard/stats-review-2015-final-amended.PDF</a> (Accessed 24/11/2016)

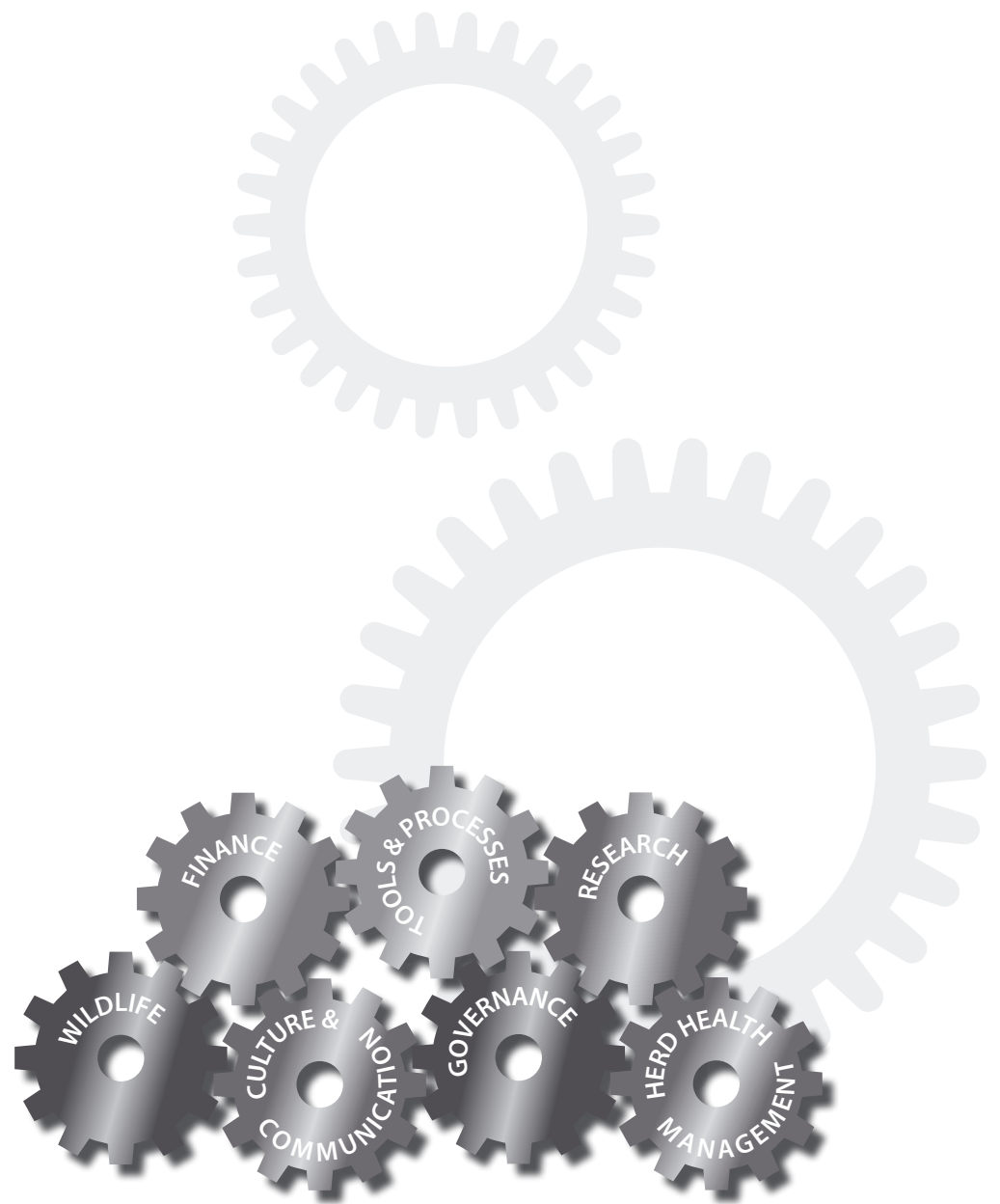
8	Agri-Food Strategy Board (2016) <i>Delivering Growth An update on actions to support the NI agri-food industry</i> [Online], Belfast, The Agri-Food Strategy Board. Available at: <a href="http://www.agrifoodstrategyboard.org.uk/uploads/cms_file/1460636653-7.pdf">http://www.agrifoodstrategyboard.org.uk/uploads/cms_file/1460636653-7.pdf</a> (Accessed 24/11/2016)
9	Department of Agriculture, Environment and Rural Affairs, CAP Policy, Economics and Statistics Division, (2016) <i>Size and Performance of the Northern Ireland Food and Drinks Processing Sector, Subsector Statistics 2014, with provisional estimates for 2015</i> [Online], Belfast, Department of Agriculture, Environment and Rural Affairs. Available at: <a href="https://www.daera-ni.gov.uk/sites/default/files/publications/dard/Size%20and%20Performance%20NI%20Food%20%26%20Drink%202014-15%20Final%282%29.PDF">https://www.daera-ni.gov.uk/sites/default/files/publications/dard/Size%20and%20Performance%20NI%20Food%20%26%20Drink%202014-15%20Final%282%29.PDF</a> (Accessed 24/11/2016)
10	Denny, G.O. and Wilesmith, J.W. (1999) 'Bovine tuberculosis in Northern Ireland: a case-control study of herd risk factors', <i>Veterinary Record</i> , vol. 144, no. 12, pp.305-310
11	Doyle, L.P. et al (2016) 'Bovine tuberculosis in Northern Ireland: Risk factors associated with duration and recurrence of chronic herd breakdowns', <i>Preventive Veterinary Medicine</i> , vol. 131, pp. 1-7
12	Doyle, L.P. et al (2014), 'Bovine tuberculosis in Northern Ireland: Risk factors associated with time from post-outbreak test to subsequent herd breakdown', <i>Preventive Veterinary Medicine</i> , vol. 116 no. 1, pp. 47-55
13	Menzies, F.D. et al (2011) 'A comparison of badger activity in two areas of high and low bovine tuberculosis incidence of Northern Ireland', <i>Veterinary Microbiology</i> , vol. 151, no. 1, pp.112-119
14	O'Hagan, M.J.H. et al (2016) 'Herd-level risk factors for bovine tuberculosis and adoption of related biosecurity measures in Northern Ireland: A case-control study', <i>Veterinary Journal</i> , vol. 213, pp.26-32
15	Burke, P. (2015) <i>Annex I.b : Programme for the eradication of bovine Tuberculosis, bovine Brucellosis or sheep and goat Brucellosis (B. melitensis) submitted for obtaining EU cofinancing</i> [Online], Brussels, European Commission. Available at: <a href="http://ec.europa.eu/dgs/health_food-safety/funding/cff/docs/animal_vet-progs_2016-7_dec-2015-3609-ec_bovine-tuberculosis_gbr.pdf">http://ec.europa.eu/dgs/health_food-safety/funding/cff/docs/animal_vet-progs_2016-7_dec-2015-3609-ec_bovine-tuberculosis_gbr.pdf</a> (Accessed 25/11/2016)

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## **An Integrated Eradication Programme**