Introduction of a statutory requirement for bovine TB pre-movement testing in Great Britain

Report of the bTB pre-movement testing stakeholder group, a sub-group of the TB strategy core stakeholder group.

Presented to the Chief Veterinary Officer, Dr Debby Reynolds, April 2005.
Introduction of a statutory requirement for bovine TB pre-movement testing in Great Britain

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Chairman’s introduction

I was pleased to take on the challenge of chairmanship of a stakeholder group to develop a practical proposal for pre-movement testing of cattle for bovine tuberculosis (bTB). It was an opportunity to work with those affected by or involved in delivery of a new policy.

Action is needed in the short term to reduce the risk of spread of bTB through cattle movements and the farming industry accepts its role in helping to achieve this. In developing our recommendations, we have sought to balance risk reduction against impact on the farming industry, auctioneers, the veterinary profession and delivery/enforcement bodies.

It was particularly important to me that this work was taken forward in the context of development of Government’s overall approach to bovine TB. The Government’s strategic framework for control of bTB in GB has now been published and makes clear that any wildlife management policy must form part of an overall approach that balances cattle and wildlife controls. I believe the control effort would be enhanced if the introduction of pre-movement testing in cattle was accompanied by measures to control the disease in wildlife.

The development of options for implementation of pre-movement testing has been a complex and at times controversial task. We were given a tight timetable and it is due to the commitment of all those involved in the Group that we have been able to deliver this detailed report to the Chief Veterinary Officer.

I am grateful to all members of the Group for their input. I should also like to thank the Defra Secretariat. The Group has been provided with a wide range of evidence to inform our considerations. In particular, the work of the Defra economists in developing a draft Regulatory Impact Assessment has been extremely informative.

Unfortunately, the Group has been unable to reach a unanimous view. Ben Messer-Bennetts (livestock auctioneer) concluded that he was unable to endorse the report. All subsequent references in this report to ‘the Group’ refer to the members set out in appendix I excluding Ben Messer-Bennetts.

I believe our recommendations should form the basis of any future legislation on this issue, recognising the need for a public consultation on the detailed proposal.

Bill Madders
Chairman
29 April 2005
Executive summary

Following consultation in 2004, GB Ministers sought action to reduce the risk of spread of bTB through cattle movements. It was decided to establish an independently chaired stakeholder group to develop a detailed proposal for introduction of a statutory requirement for pre-movement testing, on the basis that costs will be shared with farmers.

The Group took as its starting point, the initial work done by Government officials on development of a delivery proposal based on pre-movement testing of all cattle (except calves under 6 weeks of age and other specified exemptions) moving from 1-2 year tested herds to other herds. The Group has refined and developed this proposal, on the basis of evidence presented and discussions on practicality, costs and impact.

The Group has sought to define an effective yet practical mechanism for reducing the risk of spread of bovine TB through cattle movements. A key principle has been that pre-movement testing, using the skin test, is not a risk elimination measure. The proposed approach targets animals with a higher risk of harbouring undetected infection and movements where such animals present the greatest risk of disease spread.

The Group recognises that pre-movement testing will have a significant impact on some areas of the industry, particularly livestock markets. In developing ideas and reaching conclusions, the Group has informed and been informed by the Regulatory Impact Assessment (RIA), which sets out the costs and benefits of the options considered by the Group. In considering options, the Group has sought to mitigate the impacts whilst ensuring effectiveness of the measure in terms of disease control.

The Group’s recommendations are summarised below. The key recommendation is that, if pre-movement testing is to be introduced in the short-term, it should be limited to animals in 1-2 year testing herds that are over 15 months of age. There should be a number of exemptions from this requirement, including animals going direct to slaughter. The Group believes this proposal is workable and deliverable. Moving immediately to testing all animals over 6 weeks of age (as originally envisaged) would present extreme logistical difficulties for sectors of industry, particularly suckler herds, and there is also concern about veterinary resource availability. The timing of the extension of pre-movement testing to animals between 6 weeks and 15 months of age should be reviewed after 1 year.

The recommended approach for year 1 (option 8 in the RIA), applied both in England and Wales, would avoid about 650 new incidents occurring each year across GB. This would increase to a saving of around 920 new incidents each year when

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1 The recommended approach for year 1 (option 8 in the RIA) applied only in England would avoid about 520 new incidents each year across GB. This would move to a saving of around 720 new incidents when animals between 6 weeks and 15 months of age are included (see Appendix A section 5.7). This is out of a total of about 3000 new herd incidents in GB in 2004. The same approach applied only in Wales would avoid about 130 new incidents each year across GB. This would move to a saving of around 200 new incidents when animals between 6 weeks and 15 months of age are included (source Welsh Assembly Government).
animals between 6 weeks and 15 months of age are included. This is out of a total of about 3000 new herd incidents in GB in 2004 (see Appendix A sections 5.1 and 5.7).

Based on past movement patterns, it is estimated that the recommended approach for year 1 would make around 290,000 cattle movements per year from farms in England subject to extra pre-movement testing, a proportion of which (60,000) would move on the basis of the routine surveillance tests. When animals between 6 weeks and 15 months of age are included the total number of movements subject to testing would be around 560,000 (see Appendix A sections 5.2 and 5.7).

The annual costs and benefits of the recommended option for year 1 applied in England are assessed as: total costs £4.5 million, total benefits £9.8 million, net benefits £5.3 million (benefit:cost ratio 2.2:1) (see Appendix A section 5.7 and 12). The apportionment between Industry and Government is provided in Table 1.

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<th>Benefits</th>
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When animals between 6 weeks and 15 months of age are included, the net benefit is greater but so are the costs and the benefit to cost ratio is less favourable (total costs £7.3 million, total benefits £14.3 million, net benefits £7.0 million, benefit: cost ratio 2.0:1) (See Appendix A sections 5.1, 5.2, 5.3 and 12). The apportionment between Industry and Government is provided in Table 2.

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<tr>
<td>£9.9M</td>
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Summary of Recommendations

1. If pre-movement testing is to be introduced in the short term, to be practical and deliverable, it should be limited to movements of cattle over 15 months of age in 1-2 year tested herds. The timing of extension to animals between 6 weeks and 15 months of age should be subject to review after 1 year. This review should include consideration of the practical experience gained from pre-movement testing of animals over 15 months, LVI capacity and a further review of the Regulatory Impact Assessment. The outcome of the review should be considered by a representative group of Industry members, to determine when an extension of pre-movement testing to all animals is most practical. This approach will reduce the number of animals subject to testing initially and provide industry with time to adapt (see section 2.3.4).

2. It would be an offence to move cattle off premises without having had them pre-movement tested or having proof of exemption. It would also be an offence for the
initiator of the movement to not have the evidence to comply with the law. Receiving premises may be placed under movement restriction until they have had a clear herd test if unlawful movements of cattle onto them are identified that are believed to present a risk of disease spread (see section 2.2.4).

3. Anyone moving cattle from 1-2 year tested herds would be required to retain evidence of pre-movement testing having been undertaken, or of appropriate exemption from the requirement, for a minimum of 10 years, to be consistent with existing legislation (see section 2.6.2).

4. Keepers should be given a copy of the test results by the veterinary surgeon, following all TB testing (see section 2.2.2).

5. The majority of the Group believe there should be a legal requirement for evidence of testing/exemption to accompany the animal (see section 2.6.1).

6. In making pre-movement testing a statutory requirement, the legislative approach should be to require testing of all cattle prior to movement, with a number of exemptions to accommodate practical limitations and lower risk animals and movements [detailed in section 2.3, and summarised below]. This approach, of defining the circumstances under which animals should not be tested, is more practical than defining all the circumstances in which an animal should be tested:

   **Exemptions from pre-movement testing**
   - cattle subject to 3-4 yearly routine surveillance testing or annual testing on public health grounds only
   - cattle moving off premises within 1 month of arrival
   - cattle under 6 weeks of age
   - cattle between 6 weeks and 15 months of age (time limited, timing of removal of exemption subject to review after 1 year, see above)
   - cattle moving direct to slaughter or to slaughter markets
   - cattle moving directly to approved finishing units or markets for animals not pre-movement tested
   - cattle moving directly to approved TB finishing units for cattle under movement restrictions for TB or approved TB collection centres
   - cattle moving directly to agricultural shows (providing they return to the premises of origin)
   - cattle moving from agricultural shows to the premises of origin
   - cattle moving from markets
   - cattle moving for veterinary treatment or AI
   - cattle movements within a Single Occupancy Authority (SOA) or within premises sharing rights of common.
   - Divisional Veterinary Manager discretion

7. Industry members of the Group recommend a veterinary risk assessment of indefinitely exempting animals between 6 weeks and 12 weeks (see section 2.3.3).

8. Free movement of an animal should be permitted for a period of 2 months following a clear TB skin test (including from tests carried out as part of routine surveillance testing funded by Government). (See section 2.2.5)
9. Cattle herds within an SOA should be subject to the most rigorous TB testing interval prevailing within the SOA and, as far as practicable, be synchronised between all herds (see section 2.3.12).

10. Cattle herds sharing common grazing should be subject to the most rigorous routine testing prevailing and should, as far as practicable, be synchronised between all herds who share a similar right of common (see section 2.3.13).

11. There should be provision for establishment of new approved finishing units and special markets for animals from 1-2 year tested herds that have not been pre-movement tested. This is to help mitigate some of the cost and practical impacts of testing. The Group requests the possibility of excluding TB breakdowns in approved finishing units from the calculation of routine TB test frequencies (see section 2.3.6).

12. Enforcement should be for local authorities and their preferred approach is to combine on-farm inspections with existing enforcement activities at markets. The Group proposes that cattle passports should be modified so they can be used to provide appropriate evidence of testing or exemption (see section 2.5.2). The Group has not had the time to consider the detailed delivery or costs of provision of such an evidence trail, but believe it will be both useful to businesses and increase compliance levels.

13. The Group is satisfied that there is no suitable, more rigorous alternative at present to the bTB skin test and is supportive of the pilot study on the use of the gamma interferon test and related diagnostic research (see section 2.2.5).

14. Introduction of the measure should be supported by a comprehensive package of advice and guidance making clear in particular that this is a risk-reduction, rather than risk elimination, measure. This would need to include recommendations to farmers on how to address residual risk not mitigated by the proposal. For example, promotion of post-movement testing for animals should be a strong message (see section 2.2.3).

15. Relevant government IT systems (eg BCMS, AMLS, VETNET) should, in the medium term, be brought together into an integrated solution to facilitate delivery and enforcement of pre-movement testing controls. The use of VeBus by LVI’s should be incentivised in the short-term and mandated as soon as practicable (see 3.1).

16. The need to move above minimum EU surveillance testing frequencies should be kept under review, particularly in areas currently under 4 yearly testing. The Group proposes a number of additional criteria to be incorporated into herd testing interval calculations (see section 3.2.1).

17. All herds subject to 2 yearly testing should be subject to whole herd tests (see section 3.2.2).

18. Priority should be given to vaccine research (see section 3.3).
1 Introduction

1.1 Background

Bovine TB is one of the most difficult animal health problems that the farming industry faces in GB today. Currently the disease affects a small proportion of the national cattle herd and its distribution is confined to discrete regions within GB where it is endemic. Recently there has been a demonstrable spread of disease from high incidence areas to areas previously free of bovine TB.

In response to the escalating problem, Government has reviewed its approach to bTB and, in March 2005 published a new strategic framework for the sustainable control of bovine tuberculosis in Great Britain. Whilst the effectiveness of cattle based control measures already in place is not underestimated, it is accepted that more stringent cattle control including on-farm measures are required as part of a wider approach to tackling the problem which includes consideration of what additional contribution wildlife control measures might make.

Within the new strategic framework, Government is committed to slow down and prevent the spread of bTB to areas currently free of the disease, and achieve a sustained reduction in disease in cattle in high incidence areas. It is hoped that research, particularly on improved diagnostic tests and vaccines, may offer opportunities to move towards bTB eradication in the longer term. The relative contribution of cattle and wildlife (particularly badgers) to disease spread is not known, but cattle to cattle transmission and translocation of disease through cattle movements has a role to play. To date, efforts to seek to reduce spread of disease through preventative cattle movements have been restricted to advice to farmers to privately pre-and/or post-movement test animals being brought into their herds. However, there is little evidence that this is being followed widely.

The principle of introducing a statutory requirement for pre-movement testing to reduce the spread of bovine TB was set out in the bTB strategy consultation documents published by Defra, SEERAD and Welsh Assembly Government respectively in February 2004. The documents presented for consideration several options for implementing the measure. There was widespread support for action and support in principle for bTB pre-movement testing, but recognition that any action would be difficult to implement. A strong message from the consultation was the need to “keep clean areas clean”.

With reference to the guiding principles of the Animal Health and Welfare strategy, Government was keen to develop bTB pre-movement testing in partnership with stakeholders. To fulfil this objective, an ad-hoc GB-wide bTB pre-movement testing stakeholder group was formed. The remit of the Group was to develop and recommend a practical, cost-effective and enforceable policy mechanism for delivering pre-movement testing of cattle for TB on the basis that costs would be shared with farmers. The pre-movement testing stakeholder group was a sub-group of the TB strategy development core stakeholder group to reflect the fact that the measure will contribute to several of the recently published strategic goals aimed at controlling bovine TB.
In developing a detailed proposal for pre-movement testing, the Group has been in close contact with SEERAD officials who are seeking, in addition to pre-movement testing, to introduce post-movement testing in Scotland. This reflects their determination to prevent the development of hotspots in Scotland.

1.2 Ways of working

The membership and terms of reference of the pre-movement testing stakeholder group are given in Appendix I.

The whole Group met on 4 occasions between October 2004 and January 2005. Defra, the Welsh Assembly Government and Scottish Executive Officials were present at these meetings as observers; the secretariat function was provided by Defra. Updates on progress following these meetings were posted on Defra’s website. Two additional meetings were held; the first, in December 2004, was attended by only those members of the Group from the farming industry; the second in January was a meeting of the whole group without observers. A list of the papers considered by the Group in its deliberations is provided in Appendix J.

During the preparation of this report the Chair of the Group, Bill Madders, discussed the emerging recommendations with Sir Don Curry, who is generally supportive of the proposal, and separately with representatives of the National Farmers Union and the National Beef Association.

Bill Madders was also a member of the TB Strategy Development Core Stakeholder Group.

This report presents the Group’s conclusions and recommendations for implementing pre-movement testing of cattle for bovine TB in GB. It has been presented to the Chief Veterinary Officer, Debby Reynolds, as chair of the TB Strategy Development Core Stakeholder Group.
2 Implementation proposal for pre-movement testing cattle for bovine TB

2.1 Risk based approach

The Group has sought to balance risk reduction with practicality. The proposals target key sources of the risk of disease spread, namely:

- cattle that are considered to be at the highest risk of being infected at the time of movement; and
- movements that represent the highest risk of the disease being spread, either to other cattle or to wildlife.

One of the most readily available indicators of cattle that are at the highest risk of being infected is the routine bTB testing interval to which they are subject. This measure reflects the disease risk arising from:

- the geographical location of the herd;
- certain business activities that present an increased risk of cattle being infected – eg: importers of Irish cattle, bull hirers etc.

Appendix B contains a full description of the derivation of routine bTB testing intervals. The proposed measure targets cattle that are subject to annual or biennial routine bTB testing. The starting point for the Group was that animals in all annually and biennial tested herds (except those subject to annual testing solely for reasons of public health), should be subject to the requirement for pre-movement testing.

A majority of the Group believes that the movements of older animals and in particular breeding and potential breeding animals pose a greater risk for disease spread than younger animals. Veterinary advisors recommend caution in coming to this conclusion based on the data sets available.

The Group stresses that pre-movement testing is a risk reduction not a risk elimination measure. It is acknowledged that this is of concern to cattle farmers in Scotland who are looking to minimise the risk from importing cattle from England and Wales.

2.2 Implementation approach

2.2.1 Compulsory pre-movement testing for all cattle movements

It is proposed that Government legislate to establish a requirement for all cattle to have had a negative TB test within 2 months prior to being moved and that exemptions provide for instances where the risk of disease spread is considered to be low and testing to be unnecessary or impractical. The proposed exemptions are detailed in section 2.3.
2.2.2 Retention of evidence
Anyone moving cattle will be required to retain evidence of pre-movement testing having been undertaken or of appropriate exemption from the requirement. To provide suitable evidence of pre-movement testing it is proposed that keepers will be given a copy of the test results by the veterinary surgeon following all testing (see section 2.6.2). In addition, a majority of the Group is of the view that there should be a legal requirement for evidence of either pre-movement testing or exemption to accompany the animal.

Recommendation
Keepers should be given a copy of the test results by the veterinary surgeon, following all TB testing

2.2.3 Communication package
The Group recognises and wishes to emphasise the need for these measures to be supported by a comprehensive package of advice and guidance making clear in particular this is a risk-reduction measure. The communication should also recommend voluntary pre-movement testing in some situations where animals have mixed with others but which will not be covered by the legislative requirement (eg common grazing) and post-movement testing although the Group does not recommend that this becomes a statutory requirement across GB at this stage.

Recommendation
Introduction of the measure should be supported by a comprehensive package of advice and guidance making clear in particular that this is a risk-reduction, rather than risk elimination, measure. This would need to include recommendations to farmers on how to address residual risk not mitigated by the proposal. For example, promotion of post-movement testing for animals should be a strong message.

2.2.4 Legislation
It would be an offence to move cattle off premises without first having had them pre-movement tested or having appropriate proof of exemption. It would also be an offence for the initiator of the movement to not have sufficient evidence available to demonstrate compliance with the law.

Receiving premises may be placed under movement restriction until they have had a clear herd test if unlawful movements of cattle onto them are identified that are believed to present a risk of disease spread.

New legislation will be required to bring this proposal into effect.

Recommendation
It would be an offence to move cattle off premises without having had them pre-movement tested or having proof of exemption. It would also be an offence for the initiator of the movement to not have the evidence to comply with the law. Receiving premises may be placed under movement restriction until they have had a clear herd test if unlawful movements of cattle onto them are identified that are believed to present a risk of disease spread.
2.2.5 Constraints on pre-movement testing

During the development of these proposals, the Group has identified a number of disease control constraints.

2 months unrestricted movement

A sufficient interval must be left between repeat applications of the bTB skin-test in order to reduce (though not eliminate) the effects of desensitisation. This interval is accepted to be of the order of 60 days. It is also necessary to allow a sufficient incubation period for newly infected animals to maximise the likelihood of identifying infection by use of the skin-test. This is believed to require a minimum of 30 days. The Group therefore accepts that there is little option but to permit free movement of an animal for a period of 2 months following a clear bTB skin-test. Clearly, these constraints present the possibility of a recently infected animal not being detected or of animals becoming infected within 2 months of being clear tested.

**Recommendation**

Free movement of an animal should be permitted for a period of 2 months following a clear TB skin test (including from tests carried out as part of routine surveillance testing funded by Government).

Limitations of the bTB skin-test

The Group has considered the appropriateness of the bTB skin-test, as routinely used throughout GB for herd surveillance testing, for the purposes of pre-movement testing where small groups of animals will be tested. The limitations of this test are considered in Appendix C. The Group is satisfied that, at present, there is no suitable and more rigorous alternative. However, the Group would like to express its support for ongoing research on diagnostic tests, particularly in relation to the gamma-interferon blood test.

The nature of the test makes it impossible to guarantee the disease status of an animal. No available test can currently achieve this. Notwithstanding this, the Group believes that the skin test will detect a significant proportion of infected cattle prior to movement and that this represents a considerable improvement over the existing position.

**Recommendation**

The Group is satisfied that there is no suitable, more rigorous alternative at present to the bTB skin test and is supportive of the pilot study on the use of the gamma interferon test and related diagnostic research.

2.2.6 Changing environment

The Group recognises that the cattle industry is experiencing a high level of change. This is arising from several sources including:

- Common Agricultural Policy (CAP) reform.
- the recently introduced short-term measures for bTB control such as the more rigorous application of the EU Directive in the derivation of minimum routine
bTB testing intervals and the imposition of immediate movement restrictions for overdue bTB tests.

2.3 Exemptions from the requirement for pre-movement testing

The Group proposes exemptions from the requirement for pre-movement testing to address the following circumstances:

- cattle at a low risk of being infected at the time of movement;
- movements which present a low risk of disease spread;
- where extreme logistical difficulties have been identified;
- where testing is considered extremely impractical or inappropriate for other reasons.

The issues influencing the proposed exemptions detailed below, are presented in section 2.7.

**Recommendation**

In making pre-movement testing a statutory requirement, the legislative approach should be to require testing of all cattle prior to movement, with a number of exemptions to accommodate practical limitations and lower risk animals and movements. This approach, of defining the circumstances under which animals should not be tested, is more practical than defining all the circumstances in which an animal should be tested.

2.3.1 Cattle subject to 3 or 4 yearly routine bTB surveillance testing or annual testing solely on the grounds of protection of public health eg producer/retailer herds.

Cattle subject to 3 or 4 yearly testing plus herds in 3 and 4 yearly testing parishes subject to annual testing solely on the grounds of public health protection are in areas of low disease incidence. They therefore present a low risk of disease spread through movement.

2.3.2 Cattle moving off premises within 1 month of arrival

Animals that spend only a short period of time on premises are at a reduced risk of becoming infected during that period. Even if animals were to become infected whilst on the premises, detection within 1 month is highly unlikely due to the constraints of the skin-test.

To overcome potential loopholes, the exemption should be worded precisely in the legislation: “cattle moving off premises, within 1 month of arrival (with no regard to interim attendance at recognised agricultural shows or other pre-movement testing permitted temporary absence from the premises) provided that the same exemption had not been used for their movement onto the premises”.


2.3.3 Cattle under 6 weeks old

Calves under 6 weeks old are unlikely to exhibit a positive skin-test result due to not having developed a sufficient immune response.

Cattle under 12 weeks of age tend to be housed indoors or suckling their dams and are consequently regarded by Industry members of the Group to pose a lower risk to disease spread. On this basis, Industry members of the Group recommend a veterinary risk assessment of indefinitely exempting animals between 6 weeks and 12 weeks old.

Recommendation

Industry members of the Group recommend a veterinary risk assessment of indefinitely exempting animals between 6 weeks and 12 weeks old.

2.3.4 Cattle between 6 weeks and 15 months old (to be reviewed after 1 year)

During consideration of options, a number of significant issues arose that seriously threatened the practicality and acceptability of pre-movement testing as set out in option 2 of the RIA. These included:

- insufficient veterinary resource at present to meet the demand for pre-movement testing of all animals from 1-2 year tested herds, particularly given seasonal testing requirements and the recently increased levels of routine surveillance testing – this is considered in greater detail in section 2.7.1;
- insufficient time for some industry sectors, particularly the suckler beef sector, to adapt their practices to accommodate the pre-movement testing requirements,
- striking a balance between disease control and practicality. The Group debated the age threshold for exemption from pre-movement testing which would achieve maximum disease control benefit without disproportionate disruption to farmers.

To mitigate this the Group proposes that the introduction of pre-movement testing be staged through the inclusion of an exemption for animals between 6 weeks and 15 months of age, which would be reviewed after 1 year. This will greatly reduce the number of animals initially subject to testing and provide industry with time to adapt (see section 4 of Appendix A).

The Group is of the view that many of the animals moved between the ages of 6 weeks and 15 months move to finishing or fattening units where the risk of spreading the disease is reduced. This would be an acceptable group to exempt from pre-movement testing in the short term. The broader the age band for exemption in the short term, the less disruption caused to farmers. The Group is aware that there may be requests from some sectors of the industry for exempting even older animals. Recognising this, the Group suggests that a veterinary risk assessment is carried out to explore this.
This exemption may lead to keepers choosing to move some cattle at a younger age in order to avoid the requirement for pre-movement testing. The SEERAD post-movement testing stakeholder group has also expressed grave concerns about this exemption if there is no time limit on it. They feel it does not go far enough in reducing the risk of introducing bTB into Scotland from cattle movements. Their primary objective is to retain their relatively disease free status.

**Recommendation**

If pre-movement testing is to be introduced in the short term, to be practical and deliverable, it should be limited to movements of cattle over 15 months of age in 1-2 year tested herds. The timing of extension to animals between 6 weeks and 15 months of age should be subject to review after 1 year. This review should include consideration of the practical experience gained from pre-movement testing of animals over 15 months, LVI capacity and a further review of the Regulatory Impact Assessment. The outcome of the review should be considered by a representative group of Industry members, to determine when an extension of pre-movement testing to all animals is most practical. This approach will reduce the number of animals subject to testing initially and provide industry with time to adapt.

### 2.3.5 Cattle moving directly to slaughter or slaughter markets

Cattle moving directly to slaughter or to slaughter markets where their onward movement to slaughter is assured, present a low risk of disease spread.

### 2.3.6 Cattle moving directly to exempt finishing units or markets for cattle not pre-movement tested

To help mitigate some of the cost and practical impacts of pre-movement testing, the Group proposes making a provision for the establishment of exempt finishing units and markets for cattle not pre-movement tested.

It will be essential to publicise the establishment of such premises to encourage take up.

**Exempt finishing units for cattle not pre-movement tested**

These would be approved for the receipt of animals that have not been subjected to pre-movement testing when, under normal circumstances, they should have been. Approval of such units would be subject to a veterinary risk assessment by the State Veterinary Service (SVS). The proposed approval criteria and conditions of operation are detailed in Appendix E.

Movements to such premises would present a low risk of disease spread to wildlife or to cattle outside the unit. Movements off such premises would be restricted to slaughterhouses, slaughter markets or approved or exempt finishing units.

A breakdown in such a unit in a 2, 3 or 4 yearly testing parish is likely to result in the surrounding parish’s routine bTB testing interval being reduced. As this may be a disincentive for the establishment of such units, the Group requests that the possibility of excluding bTB breakdowns in such units from the calculation of routine bTB testing intervals is examined.
Markets for cattle not pre-movement tested
Some members of the Group believe that pre-movement testing will lead to a substantial decline in the numbers of animals being sold through 6-day markets as keepers choose to sell direct to abattoirs to avoid the requirement for pre-movement testing. This is reflected in the RIA. This may disadvantage both the markets and cattle keepers in terms of prices received.

To alleviate this impact, the Group proposes that there is provision for exempt markets. Movement from them would be restricted to those directly:

- to slaughter;
- back to the premises of origin (permitting the commercial advantage of sale or return);
- to a finishing unit approved for cattle not pre-movement tested ie an Exempt Finishing Unit – EFU.

All these movements present a low risk of disease spread. Thus, movements to such markets can be exempted from the requirement for pre-movement testing.

Market operators remain concerned that this measure will not adequately protect the viability of many markets. They stress that markets achieve their commercial advantage for their customers from the volume of trade. This measure will split the current 6-day market trade reducing the effectiveness of both the existing and new market streams.

Recommendation
There should be provision for establishment of new approved finishing units and special markets for animals from 1-2 year tested herds that have not been pre-movement tested. This is to help mitigate some of the cost and practical impacts of testing. The Group requests the possibility of excluding TB breakdowns in approved finishing units from the calculation of routine TB test frequencies.

2.3.7 Cattle moving directly to approved TB finishing units for cattle under TB movement restrictions or approved TB collection centres
Approved TB finishing units and collection centres are premises that, under existing arrangements, have been approved by the SVS to receive animals from premises that are under movement restrictions as a result of a TB breakdown. The similarities and differences between these units and the units outlined above in section 2.3.6 are described in Appendix F.

Approved TB finishing units are subject to similar conditions to those proposed for finishing units for cattle not pre-movement tested and therefore represent a similarly low risk of disease spread.
2.3.8 **Cattle moving directly to recognised agricultural shows provided that they return to the premises of origin**

The high level of bio-security demanded and short periods spent at agricultural shows present a low risk of disease spread.

2.3.9 **Cattle moving from recognised agricultural shows to the premises of origin**

Animals should be permitted to return only to the premises from which they were consigned to the show. Animals moving from a show to another premises would need to be pre-movement tested unless they qualify for another exemption.

2.3.10 **Cattle moving from markets**

For markets other than designated slaughter or those for cattle not pre-movement tested, cattle will be subject to the requirement for pre-movement testing before they move onto the market premises but not before moving off.

2.3.11 **Cattle moving for veterinary treatment or artificial insemination**

Such movements are occasionally necessary and present a very low risk of disease spread because there is limited contact with other animals.

2.3.12 **Cattle movements within a Sole Occupancy Authority**

The concept of Sole Occupancy Authorities (SOA) is described Appendix G. The Group recognises that movements within SOAs might present a significant risk of disease spread. However, the Group feels that matters of precedent and proportionality make it inappropriate not to exempt such movements.

The Group requests that steps are taken to ensure that all cattle herds within an SOA are subject to the most rigorous routine TB testing interval prevailing within the SOA and that, as far as is practical, routine TB testing is synchronised between all herds. Since SOAs will normally be treated as a single unit, if a breakdown occurs on one premise then cattle movements into or from all premises in the SOA will be restricted pending a veterinary risk assessment. Restrictions will only be eased at DVM discretion following this risk assessment and only after satisfactory testing has taken place.

**Recommendation**

Cattle herds within an SOA should be subject to most rigorous TB testing interval prevailing within the SOA and, as far as practicable, be synchronised between all herds.

2.3.13 **Cattle movements within premises sharing rights to the same common**

The Group understands that Government’s past experience in the application of cattle movement controls to common land indicate that the complexity of the issues that arise make it unlikely that viable, enforceable measures could be developed.
The Group recommends that this is addressed through the provision of advice and guidance.

For consistency with cattle movement legislation it is suggested that the exemption be carefully worded eg: “cattle moving between land over which the owner or keeper has a registered right of common, and premises occupied by any person or persons who share a similar registered right of that same common”.

This exempts movements between the common land and the group of premises that share registered rights of common over it. The Group therefore requests that, as with SOAs, steps are taken to ensure that all cattle herds within the group of premises are subject to the most rigorous routine bTB testing interval prevailing within the group and that, as far as is practical, routine bTB testing is synchronised between all herds who share a similar registered right of the same common.

### Recommendation
Cattle herds sharing common grazing should be subject to the most rigorous routine testing prevailing and should, as far as practicable, be synchronised between all herds who share a similar registered right of that same common.

#### 2.3.14 Divisional Veterinary Manager (DVM) discretion
The Group feels that it is necessary to provide exemption for welfare or emergency reasons, or where the risk can be contained. This could include arrangements for contract heifer rearing. The granting of such exemption should be subject to an appropriate veterinary risk assessment.

#### 2.4 Movements that would not be exempt from pre-movement testing
The Group has considered further potential exemptions but have rejected these for the following reasons.

##### 2.4.1 Movements between “linked premises”
“Linked premises” are a concession by the British Cattle Movement Service (BCMS) that permits movements between locations without them needing to be reported to BCMS. The movements do still need to be recorded in the on-farm movement record book. The Group understands that this concession is being reviewed and may be withdrawn in the future. The Group does not consider it appropriate to exempt such movements from the requirement for pre-movement testing.

##### 2.4.2 Movements of untested calves at foot
The Group considered exempting calves, which at the time that their dam was tested were too young to be tested (ie: under 6 weeks old), but that are subsequently moved with their dam within 2 months of the dam’s clear test. It is generally agreed
that such movements would reflect a very low risk of disease spread. However, it introduces additional complexity to the proposal with the concept of animals being exempt on the basis of the bTB status of another animal. The Group recognises the need to keep the proposals as simple as possible and accepts that these movements could be addressed by other means, namely:

- moving the dam and calf while the calf is still under 6 weeks;
- delaying pre-movement testing until the calf is 6 weeks old;

2.5 Enforcement

The Group recognises the importance of achieving an adequate level of compliance. Many factors are likely to affect the level of compliance, particularly industry’s perception of:

- the fairness of the measures;
- the likelihood of and implications of detection (i.e., the deterrent);
- potential incentives;
- the benefits.

The Group agrees that, in common with other Animal Health and Welfare enforcement, pre-movement testing should be enforced by Local Authorities. Animal Health and Welfare enforcement activity is provided in Appendix H. Opportunities to exploit the Cattle Tracing System (CTS), the Animal Movements Licensing System 2 (AMLS2) and Animal Movement Enforcement System (AMES), to which Local Authorities already have access, should be explored to optimise risk assessment and enforcement activities.

The Group considered two enforcement approaches—on-farm and at markets, and on-farm inspections only.

2.5.1 Inspections on-farm and at markets

The Group’s recommended approach combines on-farm inspections with existing enforcement activities at markets. Such a regime will require that evidence of testing or exemption must accompany cattle throughout all movements. The Group proposes that the existing cattle passport should be modified in some way so it can be utilised to provide evidence.

The disadvantage of this approach is the mandatory requirement that evidence accompanies all cattle movements. This will require supporting legislation and will generate further offences in addition to not having performed a bTB test prior to movement.
2.5.2 Inspections on-farm only
The Group notes that government has frequently been criticised in the past for heavy handed, bureaucratic legislation and that there is hence a move towards “light touch” methods.

Limiting enforcement activity to on-farm inspections would meet this requirement. The onus would be on the farmer to demonstrate compliance with the legislation for all cattle that had moved off his premises. Enforcement officers would ascertain compliance by examination of movement records and of evidence of a clear test or of exemption from the need to test. The onus would not be on the farmer to prove that cattle he had received had been tested in accordance with the law.

The approach has the attraction of no formal requirement for paperwork to accompany animals throughout their movement. However, the Group favours an approach where evidence of testing/exemption accompanies the animal, to encourage compliance.

**Recommendation**
Enforcement should be for local authorities and their preferred approach is to combine on-farm inspections with existing enforcement activities at markets. The Group proposes that cattle passports should be modified so they can be used to provide appropriate evidence of testing or exemption. The Group has not had the time to consider the detailed delivery or costs of provision of such an evidence trail, but believe it will be both useful to businesses and increase compliance levels.

2.6 Evidence of pre-movement testing or exemption

2.6.1 Evidence accompanying the animal
A majority of the Group believes the evidence of pre-movement testing should accompany the animal. This evidence would be mandatory and could be provided by a farmer declaration preferably facilitated in the cattle passport, or by official stamping of the passport. Further detailed consideration will be needed on practicality and cost.

**Recommendation**
The majority of the Group believe that there should be a legal requirement for evidence of testing/exemption to accompany the animal.

2.6.2 Retention of evidence on farm to prove compliance with pre-movement testing legislation
The Group proposes that evidence to prove compliance with bTB pre-movement testing legislation (i.e., a clear test or of exemption from the need to test) is retained for a minimum of 10 years, to be consistent with existing legislation, and takes the following format:
Evidence of pre-movement testing

- A copy of a bTB test results which identify each animal tested and the date of the test.

It is envisaged that private pre-movement testing will be undertaken and reported in a similar manner to current routine bTB surveillance testing. At present, when bTB surveillance testing is undertaken on behalf of the SVS, the veterinary surgeon completes a test sheet that identifies each animal tested, the result and the date of the test. A copy of this is retained by the vet and the original is sent to the local Animal Health Divisional Office (AHDO). The keeper is advised of the results by the vet at the time of the second visit.

The Group believes that a copy of the test sheet will be sufficient for the keeper to demonstrate that testing has been undertaken within the required period before movement. The Group proposes that a copy of the test sheet is routinely provided to the keeper following both routine and private testing thus providing the necessary written evidence.

Evidence of exemption

The Group believes that appropriate evidence for all the proposed exemptions will be readily available:

<table>
<thead>
<tr>
<th>Exemption</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cattle subject to 3 or 4 yearly routine TB testing</td>
<td>The letter issued annually by the SVS informing the keeper of the routine TB testing interval for their cattle</td>
</tr>
<tr>
<td>Cattle that would be subject to 3 or 4 yearly routine TB testing if not for reasons of public health</td>
<td>A letter of exemption from their AHDO</td>
</tr>
<tr>
<td>Cattle under 6 weeks old or between 6 weeks and 15 months old</td>
<td>On-farm cattle movement records, passports</td>
</tr>
<tr>
<td>Cattle moving off premises within 1 month of arrival or moving directly to:</td>
<td>On-farm cattle movement records and details of market designations (eg: market catalogues etc.)</td>
</tr>
<tr>
<td>slaughter;</td>
<td></td>
</tr>
<tr>
<td>slaughter markets;</td>
<td></td>
</tr>
<tr>
<td>approved TB finishing units;</td>
<td></td>
</tr>
<tr>
<td>approved TB collection centres;</td>
<td></td>
</tr>
<tr>
<td>finishing units approved for cattle not pre-movement tested i.e an Exempt Finishing Unit – EFU;</td>
<td></td>
</tr>
<tr>
<td>markets for cattle not pre-movement tested;</td>
<td></td>
</tr>
<tr>
<td>agricultural shows (subject to their return to premises of origin)</td>
<td></td>
</tr>
<tr>
<td>Cattle moving from markets or recognised agricultural shows</td>
<td>Originating premises being a market or agricultural show plus on-farm cattle movement records</td>
</tr>
</tbody>
</table>
### Exemption Evidence

<table>
<thead>
<tr>
<th>Exemption</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cattle moving for veterinary treatment or artificial insemination</td>
<td>Records of veterinary treatment</td>
</tr>
<tr>
<td></td>
<td>On-farm cattle movement records</td>
</tr>
<tr>
<td></td>
<td>On-farm medicines records</td>
</tr>
<tr>
<td>Cattle moving within an SOA</td>
<td>Document confirming the granting of the SOA</td>
</tr>
<tr>
<td>Cattle moving within premises sharing rights of common</td>
<td>Documentary evidence of rights of common</td>
</tr>
<tr>
<td>Cattle moving under specific written exemption granted by a DVM</td>
<td>Written exemption from DVM</td>
</tr>
</tbody>
</table>

### Recommendation

Anyone moving cattle from 1-2 year tested herds would be required to retain evidence of pre-movement testing having been undertaken, or of appropriate exemption from the requirement, for a minimum of 10 years, to be consistent with existing legislation.

## 2.7 Issues influencing our consideration of options.

### 2.7.1 LVI/SVS capacity

The Group has concerns that veterinary practices may at the outset be unable to meet the increased demand for bTB testing arising from the introduction of pre-movement testing. The desire by farmers of continued involvement of the vet in the diagnostic aspects of bTB testing will put increased demands on the profession and will be a major issue in the rollout of this proposal. Additionally, it is anticipated that any increased demand will be seasonal and therefore difficult to meet since veterinary practices are unlikely to want to take on extra vets for a whole year to meet demands in a few restricted months. There are further concerns that, because of fee differentials, Local Veterinary Inspectors (LVI) may undertake private, pre-movement testing in preference to the routine surveillance work or breakdown control work undertaken on behalf of the SVS.

### 2.7.2 Logistic/welfare issues

Animals reared for sale as suckler calves are often grazed with their dams, sometimes on common land where they run with other cattle. The calves remain with their dams until weaning which often occurs immediately before the calves are sent to market. Most suckler herds currently have their herd TB tested during the winter housed period between October to April because of difficulties with handling such herds during the grazing period. They are often grazed great distances from the buildings, and managed in very many different groups. This makes the requirement to gather, separate, test and house (or release and re-gather) the animals for pre-movement testing logistically difficult.

Many suckler herds sell large quantities—often the entire calf crop in the autumn/early winter period and often at specialist suckled calf sales.
Currently suckler herds usually undertake routine TB testing once the calves have been sold, reducing the cost and time required for testing and the risk of the imposition of movement restrictions prior to sale of the calves. The Group recognises that this is contrary to disease control risk reduction. However, disclosure of disease as a result of the requirement to pre-movement test the calves could lead to serious welfare problems due to a lack of requisite facilities to accommodate young stock prevented from moving. The Group acknowledges that measures that permit movement of animals to exempt TB finishing units help mitigate this risk.

In most high risk areas, pressures on LVI’s (related anecdotally by farmer colleagues) have translated to waiting lists to be bTB tested during the housed period. The increased numbers of tests generated by pre-movement testing will compound the problem until LVIs can make arrangements to cope. The consequences are likely to be disruption to marketing as well as animal welfare and environmental problems because of the failure to move stock off holdings where there is insufficient housing and forage.

2.7.3 Two tier market and stigma
Some members of the Group are concerned that the introduction of pre-movement testing may create a two-tier market through the stigmatism of cattle that are required to be tested. However, others argue that this is already the case and pre-movement testing may offer a degree of assurance that may counteract any stigmatism.
3 Consideration of related issues

The Group identified several issues that were not integral to the measure but that were important considerations in overall strategy to control bovine TB in GB.

3.1 Enhancing the utilisation of Information Technology

During the development of the delivery proposal the Group has considered the function of several of Government's existing information technology solutions and recognise the limited integration of some of these systems. The Group strongly recommends that, in the medium-term, these systems be brought together into an integrated solution.

VeBus is a pilot web based system introduced by the State Veterinary Service. VeBus currently enables Local Veterinary Inspectors (LVIs) and SVS field staff to download information and to receive, record and manage TB and Brucellosis tests. VeBus links to the CTS system to provide lists of cattle IDs, recorded as present within the herd, that are eligible for testing. Currently the use of VeBus is not mandatory.

Also, to optimise the potential benefits available from the capture of animal TB testing results, the Group recommends that the use of VeBus by LVIs for this purpose is incentivised in the short-term and is made a mandatory requirement as soon as practical, subject to an appropriate business case and in conjunction with other SVS priority IT developments.

With the integration of certain systems combined with the routine use of VeBus as described, enforcement of the pre-movement testing requirements could be substantially tightened. Further, the Group proposes a public interface to the Department’s (integrated) system is provided enabling industry to enquire on the provenance of herds. However, the information made available electronically should be no more than the minimum required in each case, unless the farmer/vendor has given specific permission for additional information to be disclosed.

Recommendation

Relevant government IT systems (eg BCMS, AMLS, VETNET) should, in the medium term, be brought together into an integrated solution to facilitate delivery and enforcement of pre-movement testing controls. Use of VeBus by LVI’s should be incentivised in short-term and mandated as soon as is practicable.

3.2 Review of the surveillance regime

Recent measures implemented following the review of parish testing frequencies in 2004 will need time for an effect to become apparent. It is important that the surveillance regime is kept under constant review and adapted as necessary to effectively monitor disease prevalence and incidence eg moving above minimum EU surveillance testing frequencies particularly in areas currently under 4 yearly testing. In the interim, the Group made some specific recommendations.
3.2.1 Herd testing interval to reflect disease risk
The Group proposes the following additional criteria be incorporated into herd testing interval calculations:

- all cattle herds within a Sole Occupancy Authority should be subject to the most rigorous routine TB testing interval prevailing within the SOA and that, as far as is practical, routine TB testing is synchronised between all herds. Since SOAs will normally be treated as a single unit, if a breakdown occurs on one premise then cattle movements into or from all premises in the SOA will be restricted pending a veterinary risk assessment;
- all cattle herds grazed on shared common land should be subject to the most rigorous routine TB testing interval applicable to any of the herds;
- TB testing is synchronised to occur at the same time between all herds within an SOA and those that share a similar registered right of the same common.
- herds that are subject to a proportionally high volume of incoming cattle movements should be subject to annual routine TB testing.

It is recognised that it will be difficult for the SVS to implement these proposed changes until they establish appropriate reporting/notification mechanisms for herd owners.

**Recommendation** The need to move above minimum EU surveillance testing frequencies should be kept under review, particularly in areas currently under 4 yearly testing. The Group proposes a number of additional criteria to be incorporated into herd testing interval calculations.

3.2.2 All herds on 2 yearly testing to have whole herd tests
The Group understands that the routine TB surveillance herd testing comprises two types of test:

- a Whole Herd Test (WHT) which is applied to herds in high disease risk areas and to other high risk herds such as dealer’s herds, bull hirers etc. All animals over 6 weeks old are tested;
- a Routine Herd Test (RHT) which is applied to herds in lower disease risk areas. Only adult animals (including breeding bulls and cows) and young animals acquired for breeding (ie not home bred youngstock) are tested.

The majority of the Group requests that all herds subject to 2 yearly testing are subject to whole herd tests. The Group requests that surveillance testing intervals should be kept under review.

**Recommendation** All herds subject to 2 yearly testing should be subject to whole herd tests.
3.3 Research on improved diagnostic tests and vaccination

The Group feels that reducing and eradicating bovine TB from GB is dependent on the development of vaccines. To differentiate between vaccinated and infected animals and to remove infected animals earlier a more effective diagnostic test than is currently available would also be needed.

The Group is therefore supportive of the Defra’s ongoing pilot study on the use of the gamma-Interferon (IFN-γ) test (see Appendix D for a brief summary of test). If the IFN-γ test is proven to have higher sensitivity than the tuberculin test, it may, if used in combination with the skin-test improve the overall sensitivity of diagnosis. However, if the specificity of the test is significantly lower than that of the skin test, careful analysis of the costs and benefits of using the IFN-γ test will be necessary since more cattle will be falsely identified as TB positive and slaughtered. A test with low specificity will result in disease control measures being applied when infection is not present (ie where false positive test results are obtained).

The Group appreciates that development of a vaccine is a long-term objective. However, it is imperative that priority is given to this area of research and sufficient resource is made available to take this work forward.

Recommendation
Priority should be given to vaccine research.

3.4 Wider Government strategy on bovine TB

The Government’s strategic framework for the sustainable control of bovine TB in GB was published in March 2005. This makes clear that any wildlife management policy must form part of an overall approach that balances cattle and wildlife controls. Many members of the Group share the view of the Chairman that the overall TB control effort (including compliance with pre-movement testing) would be enhanced if the introduction of pre-movement testing in cattle was accompanied by measures to control the disease in wildlife. This would promote healthy badger, as well as healthy cattle, populations.
Appendix A  Regulatory Impact Assessment

Note: This Regulatory Impact Assessment (RIA) is intended to provide an assessment of the expected impact of policy options to reduce the spread of bovine TB through cattle movements. It assesses the costs, benefits and risks of the policy options in order to provide information to help decision-makers. The assessment has been an open attempt to evaluate options using the best evidence available. It has been necessary to make assumptions and estimates where hard information is limited and to make informed guesses about the likely business response to policy measures. We welcome any additional information which would improve the estimates and we intend to review the RIA in future.

1  Title of Proposal
Introduction of a statutory requirement for bovine TB pre-movement testing in England
[Note: This RIA relates to the introduction of policy measures which would apply in England only. However, the estimated costs and benefits of the measures include the impacts of the England measures on businesses and individuals in all parts of the UK where relevant. Prior to any public consultation separate RIAs will be produced for Scotland and Wales]

2  Purpose and intended effect of measure
(i) Objective
The purpose of testing cattle for bovine TB prior to movement is to identify and prevent diseased animals from moving thereby reducing the risk of the geographic spread of disease particularly to parts of GB that are currently free of TB. As there are benefits to the herd owner of buying or selling cattle with some degree of disease assurance, it is intended that they should share the costs of tests which are outside the routine herd test. Government will provide the necessary tuberculin.

(ii) Background
The intended effect of the measure is to reduce disease spread both within endemic areas and to disease-free parts of GB. If successful, the measure will contribute towards Defra’s PSA (Public Service Agreement) 9 target that aims to reduce the spread of bovine TB to new parishes in England to below the incremental trend of 17.5 confirmed new incidents per annum by the end of 2008. Pre-movement testing is a key measure to be put in place to achieve the PSA 9 target.

Bovine TB is a serious infectious and zoonotic disease of cattle and other animals. It is a significant problem in cattle in some areas of England, though on any given day, only a small proportion (approximately 3.5 to 4%) of the total national herd is affected by TB restrictions. Despite current control measures, the number of confirmed new TB incidents in cattle herds has been steadily increasing in Great Britain since 1988 at an average rate of around 18% per annum. The disease is spreading into parishes that were previously disease free. The causes of the long-term increase in TB are not well understood. There is speculation about the relative contribution of infected cattle and badgers, but no sound understanding. Although it is hard to reason that there may be any change from the current exponential increase in disease incidence without further intervention, most believe that this is the most pessimistic possible assumption.
Tracing cattle movements associated with a TB breakdown and analysis of the TB99 Farm survey pre-Foot and Mouth Disease conducted by the Independent Scientific Group on Cattle TB (ISG) have identified that cattle movements can spread disease and are associated with an increased risk of a herd breakdown.

TB pre-movement testing is a measure that can be introduced in the near future to help contain disease whilst tools such as improved diagnostic tests and vaccines, which could offer long term prospects for elimination of disease, are developed. In their 4th report the ISG consider scientific evidence for cattle controls and advise that there is a case for pre- and post-movement testing and appropriate restocking policies. The objective has been to develop a targeted approach to prevent further geographic spread of disease.

Incidence of TB varies considerably across England. This is reflected in the frequency of routine surveillance testing which is carried out at intervals of one to four years depending on disease incidence (minimum testing intervals are specified in EU Directive 64/432). Where disease incidence is high, annual testing is the norm. By targeting cattle moving from 1 and 2 year testing herds, the intention is to focus on herds at most risk of spreading TB thus minimising the disruption imposed on the cattle industry and the cost of implementing the measure whilst realising maximum disease control benefit.

The current TB Order would have to be amended or a new Order created to support this proposal. Other legislative changes may also be necessary.

3 Risk assessment
Public expenditure on bovine TB in 2003/4 amounted to £88M, including £68M on cattle testing and compensation for cattle compulsorily slaughtered. Both numbers of tests and numbers of slaughtered reactors have shown rising trends in recent years. The Veterinary Laboratories Agency (VLA) have extrapolated the trends to 2010 to demonstrate what might happen if no action is taken to reduce the spread of TB. This is considered to be a “worst case”. The trends show slaughterings rising from 23,000 to 66,000 and animals tested rising from 5 million to 9 million. If these outcomes were realised, public expenditure on testing and compensation would rise from £68M in 2004 to £145M in 2010. The 2010 figure takes account of the expected impact of a change in compensation regime which would better control compensation payments by reducing the risk of over payments to individual cattle owners.

4 Options
Options for movement testing are summarised below. Option 1 is the baseline, against which the costs and benefits of other options can be measured. Options 2 to 7 were all included in the consultation document “Preparing for a new GB strategy on bovine tuberculosis” of February 2004 [see section 9]. Based on responses to the consultation and expert advice, Options 5, 6 and 7 were ruled out following the consultation on the grounds summarised below. Option 2 was Government’s preferred option following the 2004 consultation and was the basis for the deliberations of the pre-movement testing stakeholder group. Options 8 is a variation
of Option 2 and arose from the work of the TB Pre-Movement Testing Stakeholder Group.

**Option 1: Do nothing**  
No requirements for either pre- or post-movement testing to be introduced.

**Option 2: Pre-movement testing for all cattle moving from 1 and 2 year testing herds to any other herd (with exemptions)**  
The Stakeholder Group has developed a detailed implementation proposal for Option 2. Option 2 is assessed in detail in this RIA.

**Option 3: Post-movement testing for all cattle moving from 1 and 2 year testing herds to 3 and 4 year testing herds**  
Assessed further in this RIA.

**Option 4: Pre-movement testing for all cattle moving from 1 and 2 year testing herds and subsequent post-movement testing at all 3 and 4 year testing receiving herds**  
Assessed further in this RIA.

**Option 5: Pre- and post-movement testing of all cattle sold for breeding and production regardless of herd of origin and destination**  
This is the option likely to yield the greatest gross benefits, but it would also have the greatest costs. It is not at all targeted nor risk based so has been rejected as a disproportionate response. Not assessed further.

**Option 6: A pre-movement testing system based upon herd TB history. i.e. cattle to be tested that come from herds that have experienced and outbreak in the past five years**  
This option would have the advantage of being risk based, but would be administratively costly and complex given the need for veterinary advisors to assess the risk associated with each herd and movement. Currently, using databases storing TB breakdown information, it would be resource intensive to identify herds that would be subject to testing and consequently difficult to enforce compliance with the policy. Not assessed further.

**Option 7: Zoning. i.e. banning all cattle movements from areas of high TB incidence to areas of low TB incidence without some form of risk assessment and assurance testing**  
Zoning was an option preferred by the ISG and would involve banning all cattle movements from areas of high TB incidence to areas of low TB incidence. It would not address the risk of spread of disease through cattle movements within high risk areas.

To make it work, we would have to divide England and Wales along a north-west to south-east axis and manage any movements across the line. We would need to adjust zone boundaries if new hotspots developed and consider how we would treat small areas of endemic disease in otherwise clear areas. The high risk zone would also include a large number of 3 and 4 yearly testing parishes where the TB risks are low.
The measure would be complex to administer, expensive to deliver and a disproportionate response, bearing in mind the costs and disease control benefits plus the scientific uncertainty around the relative contribution of cattle and badgers to the spread of bovine TB. Not assessed further.

Option 8: Pre-movement testing for all cattle moving over 15 months from 1 and 2 year testing herds to any other herd (with exemptions)
This is a variation of Option 2, also developed by the Stakeholder Group. Assessed in this RIA.

5 Costs and benefits of the options
This assessment relates to the introduction of policy measures which would apply in England only. However, the estimated costs and benefits of the measures include the impacts of the England measures on firms and individuals in all parts of the UK where relevant. The impacts of similar policy measures which would apply in Scotland and Wales are analysed in their own RIAs (to be published separately).

All figures are stated on an annual basis unless otherwise specified.
The assessment of Option 2 is explained in detail. The general approach and the main assumptions apply equally to the assessment of Options 3, 4 and 8.

5.1 Benefits of Option 2
The benefits of the measure are the costs avoided by preventing new TB incidents in herds to which diseased animals would no longer move. These movements would be cases in which animals would otherwise have moved untested but where:
- TB was detected correctly in pre-movement tests under the measure; or
- Timing was rearranged by the original keeper of the cattle so that movements would take place within 60 days of the routine herd test, and TB was correctly detected; or
- The existence of the measure prevented the movement taking place at all because the benefit to the keeper was small in relation to the cost of the test.

The numbers of cattle movements in each category are estimated as 390,000, 125,000 and 47,000 respectively (see section 5.2).

In general it is assumed that, if the movement had taken place, disease would have been detected in the moved animal after it reached the destination herd. Hence the loss of the moved infected animal would have occurred in due course on the destination holding as a cost which may have attracted compensation. Allowance is made for the possibility that a small proportion of such animals carrying TB would have remained untested throughout their life and shown no visible lesions at slaughter. It is assumed that detection would have triggered tracing back to the holding of origin and movement restriction there. In some cases there would be benefits due to earlier detection and control of a TB incident on the originating holding, but in others there would be business costs as movement restrictions and testing could involve larger numbers of cattle. Reduced movements may lead to higher stocking rates in some areas which may have negative disease implications. These relatively minor gains and losses are assumed to balance each other out.
The number of new disease incidents avoided is calculated by estimating the prevalence of the disease in animals moving from herds with 1 to 2 yearly testing intervals. This estimate is critical to the economic evaluation of pre-movement testing and considerable effort has been made to obtain the best available information. Nevertheless, this parameter is not known from any previous monitoring so there remains uncertainty and it will be important to update the evidence on this point in particular. The starting point is the number of reactors to the TB test compared with the cattle population in 1 and 2 year testing parishes in recent years (source: VLA from VetNet). This gives an estimate of the average animal prevalence in 1 and 2 year testing parishes of about 0.3% (about one in three hundred cattle). This must be adjusted down because of several factors to give the prevalence in cattle moving from 1 and 2 year testing herds to other herds. The figure used in the main calculation here is that 0.17% (about one in six hundred) cattle moving from 1 and 2 yearly testing herds to other farms has TB. This assumption is consistent with assuming that all TB incidents in 3 and 4 year testing areas is due to cattle movement.

For this calculation, the skin test is assumed to have an animal-level sensitivity of about 80%, i.e. it will detect as reactors (or inconclusive reactors) eight out of ten infected cattle and miss two. (See Appendix C.)

Based on these assumptions, the expected number of batches of animals containing at least one TB case and prevented by the proposed measure from moving from 1 to 2 yearly testing herds can be calculated. It is assumed that every such movement to 3 to 4 yearly testing herds would cause a new incident. However, some movements to 1 and 2 yearly testing herds would not cause a new incident because some of these herds would have developed TB anyway through wildlife or local cattle contact, and an allowance is made in the calculation.

The number of new incidents avoided as a result of the proposed measure would be:
- About 300 in 3 and 4 yearly testing herds
- About 420 in 1 and 2 yearly testing herds.

To put this into context, the proposed measure applied in England would avoid about 720 new incidents each year compared to the total of about 3,300 new herd incidents taking place in GB in 2004; including about 300 of the 550 incidents in the 3 to 4 yearly testing areas of GB.

**Direct costs saved**
The direct costs of a new incident consist of the lost value of animals slaughtered as reactors or contacts (which may be met by the taxpayer through compensation), the costs of organising compensation less the salvage value of the animals, the additional testing costs on the farm (partly costs of SVS and LVI time met by the taxpayer, and partly costs to the farmer), and the losses due to movement restrictions.

The average number of animals slaughtered per new incident in the 3 to 4 yearly testing areas averages about 4.8 (source VLA from VetNet) over the whole duration of the incident. These areas are used because incidents there can be presumed to be mainly due to cattle movements. Of these, 3.8 would be additional to the single...
moved animal which would have developed disease anyway. Each slaughtered animal is valued in this calculation at £1,200 (including valuation costs, and net of salvage), which compares with an average taxpayer cost of £1,400 over the most recent two fiscal years.

The average number of tests per new incident is 3.2 and the average costs of SVS, LVIs and VLA per test totals about £640. These figures are simple averages of total taxpayer expenditure divided by number of tests in the most recent two fiscal years (source: Defra).

Costs to the farmer (other than the value of the slaughtered animals) are taken from results of a survey by Reading University. These include costs of testing, isolation, movement restrictions and other minor items. The average farmer costs per TB incident, sometimes called “consequential losses”, total over £2,000 or about 40% of the value of the slaughtered animals.

Adding the elements above gives total direct costs per new incident of about £8,600.

**Indirect costs saved**
In addition to the direct costs, each new incident may trigger further immediate testing on neighbouring holdings and additional routine testing for the parish. A small proportion of new incidents causes further new TB breakdowns on nearby farms in “controlled hotspots” and there is a very small risk of much more serious uncontrolled hotspots as appears to be the case in Staffordshire.

Additional routine testing clearly applies only where the testing interval is not already annual. The cost of additional testing over a ten year period (discounted to give a net present value) is estimated to be £18,800 for four year testing, £11,700 for three year testing, and £4,800 for two year testing.

New hotspots are assumed to apply only in 3 and 4 yearly testing parishes. The proportion of new incidents which become “controlled hotspots” is about 2% and each is assumed to involve about 4 other holdings as new incidents. The chance of a new incident becoming an uncontrolled hotspot involving costs of about £10M is assumed to be about 0.01% (1 in 10,000). The expected value of new hotspot costs is then about £1,700.

**Total costs saved per new incident avoided**
The total costs of a new incident are estimated to be about £8,600 in 1 to 2 yearly testing parishes and £35,000 in 3 to 4 yearly testing parishes. Applying these average cost savings to the expected number of new incidents avoided (see earlier) gives the estimate of total benefit.

**Total benefit**
The overall total benefit of Option 2 would be about £14.3M per year.

These benefits accrue mainly to taxpayers under the present arrangements whereby Defra carries the major costs of TB surveillance, through the testing and compensation regime. Savings to taxpayers would be about £9.9M. The remaining £4.4M benefits would be to farms receiving cattle from high TB risk areas which would avoid new disease incidents.
The benefits include a reduction of about 2,800 per year in the number of cattle slaughtered as a result of TB.

No account has been taken of the benefits to wildlife of keeping areas free of TB, nor of the benefits to human health.

5.2 Costs of Option 2
The main costs of the measure fall into three categories:

- Costs of carrying out pre-movement testing of cattle for all movements to which the measure would apply.

- Lost benefits to cattle businesses from movements which are rearranged or foregone in order to avoid the cost of pre-movement testing, including costs of increased stocking rate where that occurs.

- Costs incurred when the pre-movement test result is a false positive and further testing and restrictions apply where there would have been no disease and no testing in the absence of the measure.

The average testing cost per animal is likely to be about £9. This estimate includes the cost of LVI time, plus cost of tuberculin, plus costs to the farmer of arranging and conducting the test. The cost of LVI time is based on an informal survey of LVIs carried out on behalf of the Stakeholder Group, and allows for variations in the average size of batch of animals presented for testing. CTS data analysed by VLA suggest that the average size of a batch of animals moving together from the same farm to the same destination on the same day is about five animals. Farmers would be able to test together all the animals they intended to move over the coming 60 days in order to reduce the veterinary fee per animal tested.

The number of cattle movements to which testing will apply has been estimated on the basis of an analysis of actual movements in 2002 and 2003, which are the most recent data available in a form suitable for analysis. The numbers of movements likely to be affected are:

- 130,000 from farms to auction markets intended for slaughter
- 380,000 from farms direct to other farms for breeding or feeding
- 280,000 from farms via auction markets to other farms for breeding or feeding.

Of the 130,000 movements via auction market to slaughter, it is likely that a substantial proportion will avoid the cost of testing in one of two ways. Some auction sales of finished cattle will become “Slaughter Markets” and so exempt; and some farmers will choose to market their stock direct to slaughter. In both cases there will be a cost in the form of benefits from a traditional auction sale which would be foregone. For this analysis it is assumed that the cost of the former is negligible and for the latter is on average about half of the cost of the test avoided i.e. £4.50. In the absence of better information it is assumed that about one third of the total 130,000 previously indirect movements to slaughter will be made via each of the three possible routes (direct, via slaughter market, via traditional sale).
The other two categories of movements total about 660,000 cattle moving from 1 or 2 year testing herds to other farms either directly or via auction markets. Again it is likely that a substantial proportion of these movements will avoid the cost of testing in one of several ways:

- 30,000 moving within one month of movement onto the holding (estimated from a sample of movements in 2003)
- 80,000 moving within 60 days of the routine herd test (assuming current movements are distributed randomly in the year in relation to current tests)
- 60,000 moving within 60 days of the routine herd test where the test has been rearranged to fit the off-movements (assumed number)
- 60,000 movements rearranged to fall within 60 days of the routine herd test or the on-movement (assumed number)
- 45,000 movements which would be deterred by the extra charge and will not take place at all (assumed number)

The proposed measures for pre-movement testing provide for establishment of Exempt Finishing Units (EFUs) which would also avoid the costs of testing but incur other costs, producing a net cost saving if they were to be a viable business proposition. At this stage it is not possible to estimate the likely extent of development of EFUs by the industry. EFUs would replace some of the cost-avoiding movements and would add further to the number of movements avoiding testing. Significant development of EFUs would reduce the costs of pre-movement testing but has not been included in this calculation.

All the above 280,000 movements would avoid additional testing costs. However both the last two (totalling 110,000) would incur non-negligible costs to the business, assumed to average about half of the cost of the test avoided i.e. £4.50. In addition, the third group (60,000) would incur some additional costs in the event of a false positive test which would result in greater numbers of cattle about to be moved but subject to restrictions.

Taking all the above 280,000 movements from the initial total leaves about 390,000 movements onto farms which would be subject to special pre-movement testing at a unit cost of £9, giving a total of £3.6M. In addition, about 125,000 extra animals (the third and fourth categories above) would be included in routine herd tests resulting in extra costs of around £1.2M.

Cattle movements onto farms foregone would be about 45,000 (the final group above) at a unit cost of £4.5, giving a total of £0.2M.

False positives (reactors) [inconclusive reactors, by definition, are neither “true” or “false” will occur as a result of the extra tests. Assuming an animal-level specificity of 99.8% for the skin test used in GB (see Appendix C), we can expect about 2 spurious reactors per 1,000 tests. These are tests which appear to show the possibility of disease although there is in fact no disease present. The number of false test results would be about 280. The cost resulting from a false positive includes loss of slaughtered cattle, cost of additional testing and cost of movement restrictions. They are estimated on the same basis as the equivalent figures for true positive cases.
(see above under Benefits) and amount to about £5,300 per false positive and £2,800 per inconclusive. Total costs of false test results would be about £1.1M.

The total number of movements subject to testing would be about 560,000, which includes 45,000 finished animals moving to auction markets, 390,000 special pre-movement tests of stores and breeding stock, and 125,000 moving on the basis of routine surveillance tests (all as mentioned above).

Other costs

LACORS have provided the costs to local authorities for the two enforcement options that are currently being considered in relation to TB pre-movement testing.

LACORS estimate that the enforcement of TB pre-movement testing where there is a legal requirement for the cattle passport to carry confirmation of the testing status of an animal, or alternative documentation to move with the animal to prove exemption from the TB testing requirements, will cost approximately £220 000 per annum for England only. This figure is based on the ability to utilise existing levels of local authority inspections in livestock markets and during transportation.

LACORS further estimate that the enforcement costs for TB pre-movement testing where the legislation only requires evidence of the TB testing status to remain on the farm of origin is approximately £355 000 per annum for England only. The increased costs are due to the need to rely on farm visits for the enforcement of the legislation, and the additional time this would take.

Additional costs for publicity and administration by SVS are estimated here at £300,000 per year. This is a first rough estimate and is intended to be high. Costs of amending the cattle passport are not yet known.

The cost of veterinary testing is included. It is assumed that sufficient veterinary testing capacity will be available to deal with about 0.5M extra animal tests in the 1-2 year testing areas of England, which is a 23% increase in the number of animals tested in those areas and a 57% increase in the number of testing visits (assuming a batch size of 25). If veterinary capacity is not readily available, there may be extra costs and/or a reduction in the benefits achieved.

The assumed changes in movement patterns include a reduction of about 14% in the number of cattle moving from 1-2 year testing herds via auction markets. This is a combination of a 30% reduction in finished stock and 7% in store and breeding cattle. It is assumed that resources from the auction sector would be released for other productive purposes, which assumes a reduction in capacity.

Total cost

The overall total cost of Option 2 would be around £7.3M per year.

About two thirds of the costs (£5.1M) would fall on businesses moving potentially TB carrying cattle from high-risk herds (1 and 2 yearly testing) either to other farms or via traditional auction sales. The other third (£2.3M) would be a cost to taxpayers mainly to pay for extra cattle at routine herd tests when farmers chose to time their routine tests to take place shortly before movements.
Hence the measure represents a partial transfer of responsibility for the costs of potential disease spread by cattle movements to the farm business where the movement originated. The immediate response of businesses to the extra cost involved has been taken into account in the calculations.

**Costs for a typical business**
The following table compares the estimated costs of pre-movement testing with the existing cost structure of farms in the Farm Business Survey in the ten worst TB-affected counties of England. The extra veterinarian testing fees for pre-movement testing would increase existing veterinary and medicine costs by about 7 percent for the average farm with cattle, and about 13 percent for the average upland cattle and sheep farm. Adding the extra costs of handling cattle and of movement restrictions gives a total cost of pre-movement testing which would be less than one third of one percent of the total costs of an average farm business. The figures take account of the various steps which farmers can take (as set out above) to modify their cattle movements and TB testing to reduce the costs of the measure or transfer part of the cost to government though including cattle to be moved in their routine herd tests. These averages of course conceal a wide range of individual circumstances.

<table>
<thead>
<tr>
<th>Farm Type</th>
<th>Number of cattle per farm</th>
<th>Additional veterinarian testing fees (£/year)</th>
<th>Additional veterinarian testing fees (as % of previous veterinary and medicine costs)</th>
<th>All extra costs arising from the measure as a % of total costs of the business</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cattle &amp; sheep (Less Favoured Area)</td>
<td>113</td>
<td>262</td>
<td>13</td>
<td>0.7</td>
</tr>
<tr>
<td>Cattle &amp; sheep (Lowland)</td>
<td>113</td>
<td>213</td>
<td>12</td>
<td>0.5</td>
</tr>
<tr>
<td>Dairy</td>
<td>180</td>
<td>139</td>
<td>3</td>
<td>0.2</td>
</tr>
<tr>
<td>Mixed</td>
<td>143</td>
<td>200</td>
<td>6</td>
<td>0.2</td>
</tr>
<tr>
<td>All farms</td>
<td>146</td>
<td>187</td>
<td>7</td>
<td>0.3</td>
</tr>
</tbody>
</table>

5.3 **Net benefit of Option 2**
The net benefit of the proposed measure is estimated to be £7.0M per year, with a benefit cost ratio of 2.0:1. This includes a net cost to industry of £0.6M and a net benefit to taxpayers of £7.6M.

5.4 **Effect of varying the assumptions made for Option 2**
The assessment of costs and benefits has been made on the basis of analysis of available data and veterinary and technical advice. Several areas of uncertainty remain and the final calculation relies on a set of reasonable assumptions. This section shows the effect of varying the main assumptions on the final result.

A critical parameter in deciding the cost-effectiveness of pre-movement testing is the prevalence of TB in cattle which are moved from a high risk herd to another herd. The assumption above is that 1.7 per 1,000 cattle moved are carrying TB. This is consistent with the limited available information but it remains an assumption.

The break even point is about 0.83 per 1,000, i.e. pre-movement testing as in Option 2 would generate a net social benefit provided that at least 9 in every 10,000 cattle moving from 1-2 year testing herds is carrying TB. It also follows that if it is
administratively and practically possible to identify “low risk” groups of cattle with TB prevalence below 0.8 per 1,000, then it could be economically beneficial to exempt them from the measure. The costs of pre-movement testing such cattle may not justify the expected benefit, depending on the view taken of the desirability of reducing the risk of a new major hotspot.

<table>
<thead>
<tr>
<th>Prevalence of TB in animals moving from 1-2 year testing</th>
<th>Low</th>
<th>Most likely</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 per 1,000</td>
<td>1.7 per 1,000</td>
<td>3 per 1,000</td>
<td></td>
</tr>
<tr>
<td>Net social benefit</td>
<td>+£1.1M</td>
<td>+£7.0M</td>
<td>+£17.9M</td>
</tr>
</tbody>
</table>

The cost of veterinary time to conduct the tests may vary according to size of batch tested and negotiation between the parties. The current figure in routine tests is about £5.50 per animal and a higher figure is likely in smaller batches.

<table>
<thead>
<tr>
<th>Veterinary cost per animal in pre-movement test</th>
<th>Low</th>
<th>Most likely</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>£5.50</td>
<td>£6.70</td>
<td>£9</td>
<td></td>
</tr>
<tr>
<td>Net social benefit</td>
<td>+£7.6M</td>
<td>+£7.0M</td>
<td>+£5.8M</td>
</tr>
</tbody>
</table>

There is little available information on how farmers would adapt their cattle movements. The assumptions above are based on views expressed by the Stakeholder Group including representatives from dairy and beef farm sectors, the auction trade and the private veterinary sector.

<table>
<thead>
<tr>
<th>Farmer adjustment</th>
<th>Low</th>
<th>Most likely</th>
</tr>
</thead>
<tbody>
<tr>
<td>None (cattle movements not affected)</td>
<td></td>
<td>Cattle movements as in text</td>
</tr>
<tr>
<td>Net social benefit</td>
<td>+£6.4M</td>
<td>+£7.0M</td>
</tr>
</tbody>
</table>

Average value of an animal slaughtered is taken as £1,335 based on recent compensation levels net of salvage value. £1,660 is the gross compensation value alone. Some consider this a high figure and £900 is more typical of average market values. Throughout the cost-benefit calculation it is assumed that compensation levels and true market values are on average identical.

<table>
<thead>
<tr>
<th>Value of animals slaughtered in TB incident</th>
<th>Low</th>
<th>Most likely</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>£900</td>
<td>£1,335</td>
<td>£1,660</td>
<td></td>
</tr>
<tr>
<td>Net social benefit</td>
<td>+£5.8M</td>
<td>+£7.0M</td>
<td>+£7.9M</td>
</tr>
</tbody>
</table>

The number of animals slaughtered in a new incident has averaged about 4.8 over the past 10 years in 3-4 year testing herds (source: VLA from VetNet), where TB incidents can be assumed to be due mainly to cattle movements. This is close to the figure for 2000, before the period of disruption due to foot and mouth disease when the average was higher. A higher figure would be justified if recent experience throughout GB were to apply to these movements.
<table>
<thead>
<tr>
<th>Number of animals slaughtered in TB incident</th>
<th>Low</th>
<th>Most likely</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (no spread in herd)</td>
<td>4.8</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Net social benefit</td>
<td>+£2.5M</td>
<td>+£7.0M</td>
<td>+£9.6M</td>
</tr>
</tbody>
</table>

A new incident in 3-4 year testing herds is assumed to trigger contiguous testing and increased routine testing for the parish, and to risk onward transmission.

<table>
<thead>
<tr>
<th>Expected spread of TB impact from the receiving farm</th>
<th>Low</th>
<th>Most likely</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>No onward spread or increased routine testing. Neighbour herds tested.</td>
<td>Extra routine testing for 6 neighbour herds, 2% chance of &quot;mini hotspot&quot;</td>
<td>Extra routine testing for 9 herds, 10% chance of &quot;mini hotspot&quot;</td>
<td></td>
</tr>
<tr>
<td>Net social benefit</td>
<td>+£0.8M</td>
<td>+£7.0M</td>
<td>+£8.8M</td>
</tr>
</tbody>
</table>

Expected values (probability multiplied by cost) are used for the cost of onward transmission to create a major hotspot. This is a crude approach and an alternative is "safety first".

<table>
<thead>
<tr>
<th>Chances of a new major hotspot developing from a TB movement</th>
<th>Low</th>
<th>Most likely</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 in 100,000</td>
<td>1 in 10,000</td>
<td>1 in 1,000</td>
<td></td>
</tr>
<tr>
<td>Net social benefit</td>
<td>+£6.7M</td>
<td>+£7.0M</td>
<td>+£9.8M</td>
</tr>
</tbody>
</table>

Lower enforcement costs would be possible if cattle passports carry proof of testing though there would be a one off start-up cost of amending the cattle passport. No formal estimate of publicity and administration costs has yet been made.

<table>
<thead>
<tr>
<th>Enforcement and publicity</th>
<th>Low</th>
<th>Most likely</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>£0.25M</td>
<td>£0.66M</td>
<td>£1M</td>
</tr>
<tr>
<td>Net social benefit</td>
<td>+£7.4M</td>
<td>+£7.0M</td>
<td>+£6.6M</td>
</tr>
</tbody>
</table>

The sensitivity of the TB skin test is an important factor in pre-movement testing. The test is assumed to be able to detect 80% of TB infected animals (see Appendix C). The lower the assumed sensitivity of the test, the greater the proportion of false-negative animals.

<table>
<thead>
<tr>
<th>Sensitivity of the TB skin-test</th>
<th>Low</th>
<th>Most likely</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>60%</td>
<td>80%</td>
<td>90%</td>
<td></td>
</tr>
<tr>
<td>Net social benefit</td>
<td>+£3.8M</td>
<td>+£7.0M</td>
<td>+£9.6M</td>
</tr>
</tbody>
</table>

The specificity of the skin test is the proportion of non-infected cattle that are detected as negative by the test. The lower the assumed specificity of the test, the greater the proportion of false-positives.

<table>
<thead>
<tr>
<th>Specificity of the TB skin-test</th>
<th>Low</th>
<th>Most likely</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>99%</td>
<td>99.8%</td>
<td>99.9%</td>
<td></td>
</tr>
<tr>
<td>Net social benefit</td>
<td>+£2.4M</td>
<td>+£7.0M</td>
<td>+£7.6M</td>
</tr>
</tbody>
</table>
5.5 Costs and benefits of Option 3
Option 3 involves post-movement testing for all cattle moving from 1 and 2 year testing herds moving to 3 and 4 year testing herds in England. Costs and benefits are calculated on the same basis as Option 2 except where stated.

The measure would apply to about 260,000 cattle movements per year, which includes both direct farm-to-farm movements and movements farm-to-farm via markets. The benefit per TB movement detected is lower than for pre-movement testing. This is because restrictions and testing will apply on both the origin and destination holdings in the event of a test reactor post-movement. The total benefits of Option 3 would be about £9.1M, distributed £1.6M to industry and £7.6M to taxpayers under the present compensation and testing regimes. Total costs would be £4.8M, of which £2.6M would fall on industry and £2.2M on taxpayers. However this calculation does not take into account any extra costs of providing new isolation facilities for animals moved on the destination farm, where these may not exist. No extra provision has been made for potential practical problems in administering and enforcing this option.

The net benefit of Option 3 is estimated to be £4.3M per year, with a benefit cost ratio of 1.9:1.

5.6 Costs and benefits of Option 4
Option 4 combines pre-movement testing for all cattle moving from 1 and 2 year testing herds in England (as Option 2) with subsequent post-movement testing at all 3 and 4 year testing receiving herds in England. This calculation assumes that cattle originating outside England would also have been pre-movement tested.

The post-movement part of the measure would apply to about 260,000 cattle movements per year, as for Option 3. The total benefits would be about £16.0M, distributed £4.7M to industry and £11.3M to taxpayers under the present compensation and testing regimes. Total costs would be £11.3M, of which £7.4M would fall on industry and £3.9M on taxpayers. As for Option 3, this calculation does not take into account any extra costs of providing new isolation facilities for animals moved on the destination farm, where these may not exist. No extra provision has been made for potential practical problems in administering and enforcing this option.

The extra net benefit of Option 4 compared with Option 2 is estimated to be minus £2.3M per year, with a benefit cost ratio of 0.4:1. This is the extra net cost (negative net benefit) from adding post-movement testing to the basic pre-movement testing measure.

The total net benefit of Option 4 would be £4.7M, with a benefit cost ratio of 1.4:1.

5.7 Costs and benefits of Option 8
Option 8 is similar to Option 2 but exempts from testing all movements of cattle under 15 months old. For the purposes of this assessment it is assumed that the exemption is achievable in practice with no extra administration cost and without affecting the effectiveness of the remaining pre-movement testing. A practical benefit of Option 8
is that it would avoid some of the potential problems in providing sufficient veterinary practitioner capacity to carry out testing at times of peak animal movements.

Recent data on movements of cattle over 15 months old have been used on a similar basis as for Option 2. About 53 percent of the farm-to-farm movements under Option 2 whether direct or via market would be exempt. The exemption would mean a reduction in the volume of testing carried out. About 275,000 fewer individual animals would be tested per year under Option 8 than under Option 2 (about 210,000 fewer special pre-movement tests and 65,000 fewer individuals in routine herd tests).

The changes in movement patterns by farmers adapting to minimise the costs are assumed similar to those for Option 2. In practice it is likely that extra shift in movements would take place as some animals would be moved just under 15 months old rather than just over. TB prevalence in this age group would be higher than average for the exempt age group as a whole and although the shift would save costs, it would also reduce benefits, increase TB risks, and result in a small reduction in the net benefit of Option 8. This is difficult to quantify and has not been included in the calculation.

The total number of movements subject to testing would be about 290,000, which includes 45,000 finished animals moving to auction markets, 180,000 special pre-movement tests of stores and breeding stock, and 60,000 moving on the basis of routine surveillance tests.

The prevalence of TB in individual animals over 15 months old moving from 1-2 year testing herds is estimated to be 0.26 percent (26 per 10,000). This figure has been derived from detailed analysis of the age distributions of animals moved and the ages of reactors compared to the expected age pattern in the national herd (basic data provided by VLA from VetNet and CTS). It implies that the prevalence in animals over 15 months is about 1.5 times the average of all animals moved (0.17%, see Section 5.1 above), whereas prevalence in animals under 15 months is just over half the average. It is possible that this understates the risk of TB spread caused by the exemption, because the current low number of young reactors in the national herd may be partly due to the lower likelihood that these cattle will be tested in routine herd tests. There is therefore some uncertainty remaining.

On these assumptions, Option 8 would achieve a reduction in new TB incidents of about 520 each year, compared to the reduction of about 720 under Option 2. The total costs of Option 8 would be £4.5M and the total benefits £9.8M, giving net benefits of £5.3M a year and a benefit:cost ratio of 2.2:1.

The impacts on industry would be: costs £2.8M, benefits £3.0M and net benefits £0.2M. The impacts on taxpayers would be: costs £1.7M, benefits £6.8M and net benefits £5.1M.

6. Business sectors affected
This assessment takes account of the effects of the proposals on farm businesses moving cattle (either as buyers, sellers or otherwise), on auction markets and on private veterinary practices. Costs and benefits to farm businesses are set out in the text. Costs include immediate cash costs and also the costs of administration and
adjustment to existing business operations. For auctions and vets, costs and benefits are assumed to balance out (changes in sales are matched by changes in costs), but changes in business throughput are estimated.

7 Equity and fairness

The basis of the proposal for pre-movement testing is that businesses choosing to initiate the movement of potential TB-carrying cattle in high risk areas share the cost of reducing the disease spread caused by those movements. Hence a major part of the cost of the proposal falls (at least in the first instance) on the sellers of non-exempted cattle from 1 to 2 year tested herds. The benefits of reduced disease affect farm businesses buying those cattle, or their neighbours, both in low risk areas (3 to 4 year parishes) and high risk (1 to 2 year parishes). However, under the present compensation and testing regime, the main costs of TB management are borne by taxpayers and the proposal will help contain the future cost of the government-funded regime and increase its affordability.

The eventual distribution of costs and benefits within the farming industry depends on the market balance between buyers and sellers of store and breeding cattle from 1-2 year testing herds (including the elasticities of demand and supply). Increased freedom from TB risk could be reflected in some increase in market price for these cattle (although there is an alternative view that it will reinforce the existing stigma). If that is the case, then the net cost of the proposal would be shared between sellers and buyers. If not then the gross cost (£5.1M a year for Option 2) is borne mainly by sellers and the gross benefit (£4.4M) falls to buyers.

Under the options assessed in this RIA, government continues to bear the main costs of bovine TB incidents and TB testing, while industry takes some financial responsibility for reducing spread by cattle movements. However, looking only at the costs arising from movement testing, the distribution of the gross costs between the affected groups is as shown in the following table.

<table>
<thead>
<tr>
<th>Distribution of gross costs</th>
<th>Farms in 1-2 year testing that sell cattle</th>
<th>Farms in 3-4 year testing that buy cattle</th>
<th>Taxpayers</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option 2: Pre-movement testing</td>
<td>69%</td>
<td>0%</td>
<td>31%</td>
<td>100%</td>
</tr>
<tr>
<td>Option 3: Post-movement testing</td>
<td>5%</td>
<td>48%</td>
<td>47%</td>
<td>100%</td>
</tr>
<tr>
<td>Option 4: Pre- and post-movement testing</td>
<td>47%</td>
<td>19%</td>
<td>34%</td>
<td>100%</td>
</tr>
<tr>
<td>Option 8: Pre-movement testing over 15 months</td>
<td>62%</td>
<td>0%</td>
<td>38%</td>
<td>100%</td>
</tr>
</tbody>
</table>

The different elements of the cost are distributed differently between groups, as shown in the next table for Option 2. Farmers would incur almost all of the costs of special pre-movement tests but only about a third of the cost where they were able to include animals to be moved in their herd test.

<table>
<thead>
<tr>
<th>Gross costs of Option 2 (£million)</th>
<th>Farmers</th>
<th>Taxpayers</th>
</tr>
</thead>
<tbody>
<tr>
<td>More animals in routine tests</td>
<td>0.4</td>
<td>0.7</td>
</tr>
<tr>
<td>Special pre-movement tests</td>
<td>3.6</td>
<td>0.2</td>
</tr>
<tr>
<td>Other amended/foregone movements</td>
<td>0.4</td>
<td>0.0</td>
</tr>
</tbody>
</table>
The Stakeholder Group has suggested that the veterinary costs of pre-movement testing might be borne by government rather than by industry. A disadvantage of this approach is that it removes the incentive to farmers moving cattle from high risk areas to reduce or adapt those movements. On the modest assumptions made here about increased bio-security (reduced risky movements), government funding would increase the costs and reduce the benefits of the measure, so that the net benefit of Option 2 could fall from £7.0M/year to £6.4M. The net benefit would be distributed between industry £2.4M and the taxpayer £4.0M.

If half the cost of compensation for slaughtered TB reactors was met by a contribution from all cattle farmers, then the £7.0M/year net benefits of pre-movement testing (Option 2) would be distributed £1.2M to industry and £5.8M to taxpayers.

### 8 Enforcement and sanctions

Government would legislate to make pre-movement testing a statutory requirement for all cattle movements with the exemptions of a number of well-defined movements. It would be an offence not to comply with the measure. It would also be an offence to not have evidence to demonstrate compliance.

Pre-movement testing would be delivered by LVIs or private veterinarians where they have been trained as TB testers. This would be a private transaction between cattle owner and vet and the proposal is that herd owners will pay for the tests although tuberculin would be provided and paid for by Defra. The LVI would provide the cattle owner with test results, listing the animals tested. Animals with a clear test would then be certificated or assured as TB tested and can be moved within a 60-day period.

The responsibility would lie with the owner of an animal to ensure it is tested prior to movement and to retain evidence of compliance ie, evidence of a clear skin-test or exemption from the requirement.

**Details of the enforcement regime and certification (statutory or self-declaration) have to be finalised through discussions with LACORs, BCMS and others.** County Councils, Unitary authorities, London Boroughs and Metropolitan Borough Councils are the statutory enforcement body for animal health and welfare legislation relating to farm animals, and therefore would be responsible for the enforcement of TB pre-movement restrictions.

The enforcement approach by local authorities will depend on whether it becomes a statutory requirement to carry confirmation of the TB testing status with the animal, using the existing cattle passport system (as preferred by the Stakeholder Group), or whether there the legislation only requires confirmation of testing to be held on the farm of origin.
If cattle passports are used to provide confirmation of testing then the focus of enforcement will be concentrated in markets, during transportation checks and through existing on farm inspections.

If the statutory requirement requires only on farm records to be kept then the local authority enforcement will focus on farm inspections using the established risk based approach.

Levels of compliance will be dependent on the acceptability of the measure to the cattle industry and the deterrent for non-compliance. The latter is dependent to some extent on the likelihood of the enforcement approach detecting non-compliance. The cost/benefit calculations above assume that the effects of non-compliance are negligible and that applies uniformly to all the Options.

9 Consultation
Within Government: Defra has been developing the proposal and RIA in consultation with colleagues from the Scottish Executive and the Welsh Assembly as well as with delivery agents (including LACORS). The Cabinet Office is represented on the Defra Programme Board where the detailed proposal has been considered. The 2004 public consultation (see below) invited views from other Government Departments.

Public consultation: In February 2004, Defra published a consultation on the TB strategy review and short-term cattle measures, including options for reducing the risk of spreading disease through cattle movements. Defra’s preferred option was for pre-movement testing of cattle moving from 1-2 year testing herds to other herds. In all options the proposal was that herd owners would pay for the tests (though Government would provide the tuberculin necessary to do the test). The written consultation was supplemented with 7 regional meetings in England and a national meeting in London.

Consultees generally supported the principle behind the proposal and agreed with Defra’s preferred option – which has lead to the shortlisting of options in this assessment. The proposal that herd owners should pay for the test did not find widespread support. An independently chaired stakeholder group was set up to develop a detailed proposal for pre-movement testing across GB (on the basis that costs would be shared with farmers as proposed). This RIA reflects as far as possible their deliberations.

Further public consultation on the detailed proposal, the draft SI and RIA would be needed prior to implementation.

10 Small firms impact test
For the purpose of RIAs small firms are firms with:
- fewer than 50 employees; and
- no more than 25% of the business owned by another enterprise (which is not a small business); and either
- less than £4.44 million annual turnover; or
- less than £3.18 million annual balance sheet total.
Based on these criteria, virtually all farms in England are small firms and only 0.2% of farms are not small firms. The impact of the proposal on farms is set out above, and includes both cash costs and non-cash costs such as disruption to existing business activity.

The Stakeholder Group comprised individuals from the main sectors affected, who were themselves small business people. Exemptions and special provisions have been incorporated into the measure to reduce the impact on businesses where possible without disproportionately affecting the potential impact of the proposal on reducing TB.

11 Competition assessment

Introducing a requirement to pre-movement test certain cattle would have minimal impact on competition in the sector. The market in question is the international beef market, since imports of beef (both live cattle and carcase meat) are considerable. Affected beef farmers comprise a small section of the market.

No business has more than 10% of the market, and the three largest businesses have less than 50% market share. The regulation will affect some farms substantially more than others, since only those farms subject to 1 and 2 yearly TB testing that sell cattle other than directly to slaughter will be affected. The requirement would not lead to extra set-up or ongoing costs when compared to farms already operating. The sector is not characterised by technological change.

The requirement will have minimal impact on market structure, although there will be some deterrent to selling cattle via an auction market rather than direct to another farmer or to slaughter. This would be likely to reduce the number of auctions operating and there may be some impact on market transparency. However, consumers are unlikely to suffer because of this.

12 Summary and recommendation

The following table and figure summarise the estimated costs and benefits of the options. The figures are expressed as annual costs and benefits.

All of the active options have a positive net social benefit and benefit:cost ratio greater than one. This assessment supports the implementation of a requirement for TB testing of cattle moving from high-risk herds, rejecting Option 1.

Option 3 (post-movement testing) offers the lowest net benefit and is the least effective in terms of disease control. Option 4 (pre-movement testing plus post-movement testing) gives the greatest disease control but at the highest cost. The addition of post-movement testing is estimated to prevent a further 70 TB incidents per year at a cost of about £50,000 each, which appears high in relation to the benefits. This assessment would support the rejection of Options 3 and 4.
<table>
<thead>
<tr>
<th>Option</th>
<th>Total cost</th>
<th>Total benefit</th>
<th>Net benefit</th>
<th>Benefit: cost ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option 1: Do nothing</td>
<td>Baseline</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Option 2: Pre-movement testing</td>
<td>£7.3M</td>
<td>£14.3M</td>
<td>+£7.0M</td>
<td>2.0:1</td>
</tr>
<tr>
<td>Option 3: Post-movement testing</td>
<td>£4.8M</td>
<td>£9.1M</td>
<td>+£4.3M</td>
<td>1.9:1</td>
</tr>
<tr>
<td>Option 4: Pre-movement testing (as Option 2) plus post-movement testing</td>
<td>£11.3M</td>
<td>£16.0M</td>
<td>+£4.7M</td>
<td>1.4:1</td>
</tr>
<tr>
<td>Option 8: Pre-movement testing over 15 months</td>
<td>£4.5M</td>
<td>£9.8M</td>
<td>+£5.3M</td>
<td>2.2:1</td>
</tr>
</tbody>
</table>

Further consideration of Options 2 and 8 is required. The next table (below) sets out the distribution of costs and benefits of the two options between taxpayers and industry.

Option 2 is pre-movement testing for cattle moving from high risk herds, while Option 8 is a variation of Option 2 which would exempt cattle under 15 months old. Option 2 is estimated to be more effective in disease control, preventing an estimated 200 more new TB incidents per year. The benefits of preventing these incidents are estimated to exceed the costs.

Option 8 has a better benefit:cost ratio. This results from limited available evidence which suggests that cattle under 15 months have a lower risk of carrying TB. However veterinary advice is that cattle under 15 months from herds in high TB-prevalence areas should not be considered an insignificant risk.
The costs of the measure are shared roughly one third to taxpayers and two thirds to industry (slightly more to industry in Option 2, slightly less in Option 8). The benefits accrue more to taxpayers under the present arrangements whereby Defra carries the major costs of TB through the testing and compensation regime. However there are significant estimated benefits to industry from reduced TB incidence, so that the net effect on industry is close to neutral (a small net cost for Option 2 and a small net benefit for Option 8). This assessment takes into account a range of actions by industry to mitigate costs whilst responding to the additional incentive to reduce potential disease risk through cattle movement.

A disadvantage of Option 2 is that it may be difficult and more costly to implement in full in the short term given constraints in veterinary testing capacity and the ability of industry to adapt rapidly.

<table>
<thead>
<tr>
<th>(All figures are per year)</th>
<th>Option 2</th>
<th>Option 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>New incidents avoided</td>
<td>720</td>
<td>520</td>
</tr>
<tr>
<td>Benefits</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>£14.3M</td>
<td>£9.8M</td>
</tr>
<tr>
<td>Taxpayers</td>
<td>£9.9M</td>
<td>£6.8M</td>
</tr>
<tr>
<td>Industry</td>
<td>£4.4M</td>
<td>£3.0M</td>
</tr>
<tr>
<td>Costs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>£7.3M</td>
<td>£4.5M</td>
</tr>
<tr>
<td>Taxpayers</td>
<td>£2.3M</td>
<td>£1.7M</td>
</tr>
<tr>
<td>Industry</td>
<td>£5.1M</td>
<td>£2.8M</td>
</tr>
<tr>
<td>Net benefits</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>+£7.0M</td>
<td>+£5.3M</td>
</tr>
<tr>
<td>Taxpayers</td>
<td>+£7.6M</td>
<td>+£5.1M</td>
</tr>
<tr>
<td>Industry</td>
<td>-£0.6M</td>
<td>+£0.2M</td>
</tr>
</tbody>
</table>

The above shows the expected reduction in new TB incidents per year from applying Option 2 or Option 8 in England alone. Similar measures for Wales are assessed in a separate RIA. Pre-movement testing as in Option 2 applied both in England and Wales, would avoid about 920 new incidents each year across GB, while with exemption of animals under 15 months as in Option 8 it would avoid about 650 incidents. This is out of a total of about 3,000 new herd incidents in GB in 2004.

This analysis depends on estimates and assumptions as set out above. However varying the assumptions within reasonable limits does not alter the main conclusions.

**Recommendation:** This assessment supports proceeding with Option 2 pre-movement testing. However if Option 2 is considered impracticable in the short term, the evidence supports Option 8 (pre-movement testing for cattle over 15 months of age) as a first step.
Comparing the costs with the TB risks avoided
(Moving up the page means more risk avoided. Moving to the right means higher costs.)

Moving up the line
From Option 1 to Option 8 costs £4.5 M to save 520 TB incidents (£9,000 per incident saved)
From Option 8 to Option 2 costs £2.8 M to save 200 TB incidents (£14,000 per incident saved)
From Option 2 to Option 4 costs £4.0 M to save 70 TB incidents (£58,000 per incident saved)
Appendix B  Derivation of routine bTB testing surveillance intervals

Overview
EU regulations (Directive 64/432/EEC, the ‘Directive’) requires routine surveillance testing of cattle herds if they are to retain the official tuberculosis-free status. The frequency of such testing is determined from a systematic assessment of the disease risk.

Assessment of Disease Risk
The assessment of disease risk is undertaken by the State Veterinary Service and results in the establishment of routine bTB testing intervals applicable to geographic areas and to individual cattle herds. Every year, SVS headquarters will conduct a full review of routine bTB testing intervals, to ensure that these are compliant with the Directive. In addition to this central, annual exercise, smaller scale, local adjustments to testing intervals can be made during the year by Divisional Veterinary Managers as and when circumstances require.

The process for the assessment of disease risk is a formulaic approach defined in the Directive coupled with the application of veterinary expertise. The formulaic approach reflects the geographic disease prevalence while the veterinary input takes more specific, local factors into account. The process is summarised below.
1. Calculate the formulaic minimum testing interval for a geographic area.
2. Apply the calculated testing interval for a geographic area to all parishes contained within it.
3. If, subject to veterinary risk assessment, it is deemed necessary, reduce the testing interval for selected parishes.
4. Apply the testing interval for a parish to all bovine herds within it.
5. If, subject to veterinary risk assessment, it is deemed necessary, reduce the testing interval for selected herds.

The basis for each step in the assessment process is detailed in the following sections.

1. Calculation of minimum testing interval for a geographic area
The Directive requires that, to retain their official TB-free status, all bovine herds are subject to annual TB testing. However, the Directive allows for a stepwise relaxation of annual testing in a defined geographic area if the prevalence of bTB is below a certain threshold. When applying this derogation, the Directive prescribes the use of a formula for the calculation of the annual prevalence of bTB in an area.

1 Counties or Unitary Authorities in GB are divided into smaller administrative units (‘parishes’), which constitute the basis for the registration of agricultural premises since the 1970s and for the calculation of TB testing frequencies in most counties of England and Wales.
The geographic areas to which the formula is applied are selected according to the prevailing disease situation in the areas. In areas of very low disease incidence, larger areas are considered. The SVS apply the calculation of bTB prevalence laid down in the Directive as follows:

- Scotland is considered as a single geographic area.
- In England and Wales the calculation is initially applied at county level. In low incidence counties, that is those where the prevalence calculation results in 4-yearly testing, this testing interval is applied to all parishes in that county. Where a county in England or Wales does not qualify for “blanket” 4-yearly testing, the calculation of bTB prevalence is applied to each parish within that county.

The criteria for increasing the routine bTB testing interval within a geographic area are based on an examination of the “average annual percentage of herds confirmed as infected with TB” within the area over various time periods, thus:

<table>
<thead>
<tr>
<th>Average annual percentage of herds confirmed as infected with TB (threshold value)</th>
<th>…over the past…</th>
<th>Required testing interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>greater than 1%</td>
<td>2 years</td>
<td>annual</td>
</tr>
<tr>
<td>less than 1%</td>
<td>2 years</td>
<td>biennial</td>
</tr>
<tr>
<td>less than 0.2%</td>
<td>4 years</td>
<td>triennial</td>
</tr>
<tr>
<td>less than 0.1%</td>
<td>6 years</td>
<td>4-yearly</td>
</tr>
</tbody>
</table>

The “annual percentage of herds confirmed as infected with TB” is calculated as follows:

\[
\text{Total number of herds in area confirmed as infected with TB in year} \times 100 / \text{Total number of herds in area in year}
\]

An average annual percentage of infected herds for the appropriate number of past years is calculated and compared to the appropriate threshold value. A herd is considered to be “confirmed as infected” if it was subject to TB restrictions arising from a confirmed TB breakdown at any point during the year. A TB breakdown is “confirmed” if characteristic lesions of TB are detected in and/or the TB organism [Mycobacterium bovis] isolated from at least one of the skin-test reactors in that herd.

For the purposes of this calculation, the Directive does not take into account the origin of each confirmed breakdown. Therefore, confirmed breakdowns caused by the purchase of infected cattle will carry the same weight as those attributed to a wildlife source. This may result in isolated parishes in the middle of previously “clean” areas being temporarily placed under annual or biennial bTB testing (e.g. parishes in Cumbria and the Northeast of England). The resulting increased level of TB surveillance will ensure that any spread of infection to local herds and/or wildlife should be detected sooner rather than later.
2. **Apply testing interval for a geographic area to parishes**
   The testing intervals for the geographic areas arising from the previous step are applied to all parishes within the respective geographic areas (i.e. country, county or parish).

3. **Decrease the testing interval for a parish**
   The distribution of parish testing intervals arising from the previous step is subject to veterinary risk assessment with a view to applying more frequent testing where appropriate. The criteria used by DVMs for this assessment are as follows:

   **Criteria for decreasing the testing interval in a parish to annual:**
   - Parishes where disease has been confirmed on two or more holdings in the last 5 years where the possibility of purchased infection and contiguous spread has been eliminated.
   - Parishes where disease has been confirmed on one holding in the last 5 years where the possibility of purchased infection has been eliminated AND where disease has been confirmed in wildlife within the last 5 years.
   - Parishes without confirmed disease in the last 5 years but where the proximity of confirmed disease in cattle or wildlife close to the parish border is likely to put cattle within that parish at risk.
   - Any parish within the vicinity of parishes tested more frequently where, in the opinion of the DVM, there is a significant risk of disease in cattle.
   - Parishes involved in the Randomised Badger Culling Trial (RBCT).

   **Criteria for decreasing the testing interval in a parish to biennial:**
   - Parishes adjacent to annual testing parishes unless the only confirmed disease in the adjacent parish is sufficiently distant or where an intervening geographic feature provides a barrier.
   - Parishes with a large number of unconfirmed breakdowns.
   - Any parish in the vicinity of annual testing parishes where, in the opinion of the DVM, there is a need for more frequent testing.

   The veterinary risk assessment can only be used to decrease the testing interval calculated by the formulaic method.

4. **Apply parish testing interval to herds**
   The parish testing intervals arising from the previous steps are recorded by the SVS, advised to keepers of bovine herds, and applied as the maximum testing interval for all herds within the respective parishes.
5. Decreasing the testing interval for a herd

The testing interval of bovine herds is then subject to further veterinary risk assessment with a view to applying more frequent testing where justified on animal or public health grounds. The criteria used by DVMs for decreasing the testing interval of a herd to annual are provided below.

Public health reasons:
- where the owner is a producer/retailer of unpasteurised milk;
- city and open farms.

Animal health reasons:
- where there is a regular intake of Irish cattle;
- bull hirers;
- dealers;
- heifer rearers;
- AI studs;

Again, the veterinary risk assessment can only be used to decrease the testing interval over that of the parish in which the herd is registered.
Appendix C  Limitations of the bTB skin-test

The appropriateness of relying on the bTB skin-test for pre-movement testing has been subject to extensive scrutiny and was well evidenced in a paper (currently being prepared for publication) provided to the Group by Government’s veterinary advisors.

**Sensitivity**
The sensitivity of the bTB skin-test is believed to be between 70 and 90% when inconclusive reactors are not removed until their status is resolved. This, particularly when the test is used on individual or small numbers of animals, as may be the case for pre-movement testing, represents an unavoidable constraint and a small percentage of infected animals will remain undetected.

**Specificity**
In contrast, the specificity of the test used in the UK (i.e., the single intradermal comparative cervical test, SICCT) is believed to be very high (well in excess of 99%) providing an assurance against significant numbers of false-positive results.

**“False positives”**
There is a perception that any positive skin-test that is not confirmed by post-mortem inspection and/or culture is a false-positive.

The relatively low proportion (approx. 35 to 45%) of test reactors found to have positive post-mortem and bacteriological results is often used to discredit the validity of the tuberculin test. This belief arises from the mistaken assumption that post mortem examination and culture of test reactors are the gold standards against which one should assess the accuracy of the tuberculin test. The corollary from this misconception is that 65 to 55% of reactors must be “false positives”. There are, indeed, some instances where a test reactor cannot be confirmed on post mortem examination and culture of tissues, but there are several reasons for this. The sensitivity of the skin-test used in the UK is believed to be between 70% and 90% when inconclusive reactors (IRs) are regarded as potentially infected animals and not released until further testing resolves their status. The imperfect sensitivity of the skin test represents an unavoidable constraint and a percentage of infected animals will remain undetected. The risk of missing infected animals will decline as the size of the batch of animals undergoing pre-movement testing increases and if IR results are taken as strong indication of infection.

However, the vast majority of cattle that fail the comparative tuberculin test used in GB are infected with *M. bovis* or have been exposed to the bacterium and developed an immune response against it. Due to the latent period between infection and the development of detectable (clinical) signs of bovine TB, the host's immune response will be evident at earlier stages following infection than the pathological changes caused by the bacterium (e.g., visible lesions), and
probably before bacterial loads are sufficiently large to be detected by standard
culture methods. Furthermore, *M. bovis* is a difficult organism to grow in the
laboratory. All this has two consequences: firstly, the ante mortem diagnostic
tests for TB (the tuberculin and gIFN tests), by detecting infection rather than
disease, can be more sensitive in identifying *M. bovis* infected cattle than the so-
called "gold standard" (bacteriological culture). Secondly, at abattoir inspections,
a proportion of these identified animals will not have visible lesions, nor can *M.
bovis* be subsequently cultured from tissue samples. To imply that such animals
are “false-positive” is, therefore, simplistic, inappropriate and misleading, as they
may be at an early stage of disease where the bacillus cannot yet be detected.
Such animals may be harbouring the bacilli, and when the disease has
progressed further, become infectious to other cattle. The removal of test
reactors is, therefore, from a disease control position, a desirable outcome of
(pre-movement) testing.

“False negatives”
False negative skin tests may occur in animals for a variety of reasons. Recently
infected cattle generally do not react to tuberculin. Hypersensitivity to tuberculin
usually develops in cattle between 3 and 6 weeks after infection with *M. bovis*. It
is, therefore, possible for young calves under 6 weeks of age to give no reaction
to the skin test even if they were infected soon after birth. This is why this age
group is often excluded from tuberculin herd tests. The gamma interferon blood
test does not resolve this problem, as its manufacturers advise against its use in
cattle under 6 months old due to high, non-specific gamma IFN responses in this
age group.

Additionally, a state of ‘anergy’ may develop in cattle with advanced or
generalised TB and in animals subjected to stress. Tuberculous cows that have
calved within the preceding four to six weeks sometimes fail to react to the
tuberculin test. False negative skin tests may also occur due to operator error,
e.g. if tuberculin is not lodged into the skin, the volume injected is smaller than
the required 0.1 ml dose, or if the test is read too early or too late.

Following an injection of tuberculin, the ability of a tuberculous animal to react to
a second injection is reduced for some time. Reactivity generally returns to
previous levels at around 60 days after the injection of tuberculin. To overcome
this desensitising effect of tuberculin, an interval of 60 days must be allowed
between repeated skin tests on the same animal.

Application of the test
The Independent Scientific Group’s (ISG) Second report in 2000, outlined
shortcomings of the skin test in terms of quality control. This was in relation to
batch-to-batch variation of the diagnostic protein used (purified protein derivative
– PPD) and to subjectivity in the application and reading of the test. The ISG’s
Fourth Report (2004) recommends that a quality control study of the application
and use of the skin test in the field should be undertaken.
Appendix D  The Gamma-Interferon (γ-IFN) Test

Among the reasons advanced for the lack of progress in eradicating TB from cattle in the UK is the imperfect sensitivity of the SICCT. It is hypothesised that a significant number of infected cattle will not be detected by a test lacking perfect sensitivity. These undetected cattle serve as a reservoir of infection for other cattle and make the elimination of the organism from an infected herd more protracted. Incomplete sensitivity also increases the risk that undetected TB-infected animals remain in the herd after the lifting of restrictions. Therefore, use of a more sensitive test (or combination of tests) in infected herds should speed up the resolution of TB herd breakdowns.

The γ-IFN assay is a blood test developed in Australia in the late 1980s for the diagnosis of TB in cattle in combination with the caudal fold tuberculin test. Although the test played a very small role in the eradication of TB from the Australian cattle herd, the γ-IFN assay was accredited as an official diagnostic test for bovine TB in Australia in 1991 and soon afterwards it was also adopted in New Zealand, to supplement the caudal fold tuberculin test in cattle herds. In July 2002 the European Commission approved its use as an adjunct to the conventional tuberculin tests to increase the detection of tuberculous cattle in infected herds. The γ-IFN test is not approved for use as a stand-alone routine screening test for bovine TB within the European Union.

Gamma-IFN is a cytokine (immunological ‘hormone’). Like conventional tuberculin tests, the principle of the γ-IFN test is the detection of the cell-mediate immune response that develops following M. bovis infection. Within two weeks or so of infection with M. bovis, cattle will generally have T-cells in their blood that produce high levels of γ-IFN when stimulated with bovine tuberculin. Conversely, if an animal has been infected with M. avium or other atypical mycobacteria, γ-IFN levels will usually be greatest when T-cells are incubated with avian tuberculin. Infection with M. bovis is strongly indicated when bovine tuberculin stimulates more γ-IFN production than both avian tuberculin and the nil antigen control. The amount of γ-IFN produced by cattle T-cells is measured as a colour change in the ELISA stage of the test and expressed in optical density (OD) units.

Diagnostic performance of the γ-IFN test has been evaluated in several studies conducted in Australia, Brazil, Ethiopia, Ireland, Italy, Northern Ireland, Spain, USA and New Zealand. In these trials, the sensitivity of the γ-IFN test varied between 73.0 and 100%, with a median of 86.2%. Its median specificity was 97.3%, with a range of 87.7 to 99.6% (Table 1). As expected, these results were influenced by the characteristics of the cattle populations in which the test was evaluated, the different cut-off values adopted to classify animals as positive to the test and the criteria used to establish the true M. bovis infection status of the animals in the study (i.e. the “gold standard”)

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Although the γ-IFN test is now used in several countries, experimental data is lacking on the cost-effectiveness of using γ-IFN in conjunction with the SICCT in field conditions. The γ-IFN assay is widely considered to be at least as sensitive as the skin test and, in addition, will detect a proportion of infected cattle that fail to react to the tuberculin test. The likely reason for this is that the γ-IFN test detects infection at an earlier stage than the skin test does, although there is also evidence that the two tests detect slightly different populations of tuberculous cattle.

Additionally, the γ-IFN test can be used to help resolve the status of herds sustaining a prolonged unconfirmed TB incident attributed to non-specific reactions to the tuberculin test (‘Non-specific reactor’ herds) and reduce the unnecessary slaughter of cattle that are falsely positive to the skin test.

The γ-IFN test is not used as a primary test for mass screening on its own because it does not detect all skin test-positive infected animals, it is relatively expensive and is less specific than the SICCT (i.e. more γ-IFN reactors will be uninfected than with the SICCT).

However, it is postulated that the use of the γ-IFN test in tandem with the SICCT would allow the removal of more (but not necessarily all) infected cattle from a breakdown herd than use of the skin test alone. If this proves to be true, use of the two tests in quick succession should speed up the elimination of infection from affected herds. Both tests share the disadvantage that they have a low probability of detecting infected cattle that are in a state of depressed cell-mediated immune response to tuberculin (‘anergy’).

One can summarise the advantages of the γ-IFN compared to the tuberculin tests (particularly the SICCT) as follows:

- Higher sensitivity;
- Possible detection of tuberculous cattle at an earlier stage of infection;
- It can be repeated in an animal with virtually no delay, as no tuberculin is injected into the skin (although the reaction to the γ-IFN test may be depressed in some cattle in the first week following skin testing);
- Only one visit is required to restrain the animals for testing;
- More objectivity, with less potential for human error, variability and fraud, because all measurements are laboratory-based.

In contrast, the disadvantages of the γ-IFN test compared to the tuberculin tests are:

- Lower specificity, although this may be improved by the inclusion of defined mycobacterial antigens like ESAT-6;
- Unreliable results in cattle under 6 months old;
- Need to incubate blood samples in the laboratory within a short time after collection;
- High cost of the laboratory component of the test.
Current uses of the γ-IFN test in GB

There are four situations in which the γ-IFN test can currently be applied in TB reactor herds in GB:

a) as a ‘parallel’ test (i.e. in tandem with the tuberculin test) for cattle not removed at the disclosing test in new, confirmed TB breakdowns eligible for the Gamma Interferon Field Trial, but only where the herd has been randomly allocated the γ-IFN test;
b) as a ‘parallel’ test for non-reactor cattle in ongoing, confirmed TB incidents that do not qualify for the above field trial, but have a chronic TB problem;
c) as a ‘serial’ (i.e. confirmatory) test, to resolve the status of reactors/IRs in unconfirmed TB incidents where there is evidence of non-specific reactions;
d) as an aid to decision making in relation to whole or partial herd slaughter.

Research

Defra is planning conducting a small field study to determine the specificity (and, hence, the false-positive rate) of this test as used in UK conditions in low-TB prevalence areas.

*M. bovis* antigens with enhanced specificity are being validated for routine use in the γ-IFN test, as alternatives to bovine tuberculin.

Research is also continuing to improve the γ-IFN test and develop its use for differentiation between vaccinated and infected animals.
Table 1 - Summary of results of published studies estimating the sensitivity and specificity of the γ-interferon (BOVIGAM™) test in cattle. The interpretation criterion for a positive test result was not the same in all the studies.

<table>
<thead>
<tr>
<th>Bovine tuberculin (mg/ml)</th>
<th>Avian tuberculin (mg/ml)</th>
<th>Number tested (of which necropsied)</th>
<th>Apparent proportion diseased (%)</th>
<th>Sensitivity (%)</th>
<th>Specificity (%)</th>
<th>References (country)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.2</td>
<td>0.2</td>
<td>1362 (1362)</td>
<td>1.6</td>
<td>81.8</td>
<td>99.1</td>
<td>Wood et al. 1992 (Australia &amp; NZ)</td>
</tr>
<tr>
<td>0.3</td>
<td>0.3</td>
<td>6264 (6264)</td>
<td>1.4</td>
<td>81.6</td>
<td>99.4</td>
<td>Wood et al. 1991 (Australia)</td>
</tr>
<tr>
<td>0.3</td>
<td>0.3</td>
<td>5733 (0) cattle from herds free from TB for at least 5 years</td>
<td>0.0</td>
<td>Not evaluated</td>
<td>96.2 97.4 98.0 98.1 97.8</td>
<td>Wood et al. 1991 (Australia)</td>
</tr>
<tr>
<td>0.5</td>
<td>1.0</td>
<td>2799 (1027)</td>
<td>6.4</td>
<td>84.3</td>
<td>Not evaluated</td>
<td>Nell et al. 1994b (Northern Ireland)</td>
</tr>
<tr>
<td>0.5</td>
<td>1.0</td>
<td>1396 (0) cattle presumed uninfected</td>
<td>0.0</td>
<td>Not evaluated</td>
<td>99.6</td>
<td>Nell et al. 1994a (Northern Ireland)</td>
</tr>
<tr>
<td>Not given</td>
<td>Not given</td>
<td>656 (656) one infected herd</td>
<td>31.1</td>
<td>73.0</td>
<td>Not evaluated</td>
<td>Whipple et al. 1996 (USA)</td>
</tr>
<tr>
<td>0.02</td>
<td>0.02</td>
<td>1036 (140)</td>
<td>10.7</td>
<td>93.7 87.4</td>
<td>Not evaluated</td>
<td>Domingo et al. 1995 (Spain)</td>
</tr>
<tr>
<td>Not given</td>
<td>Not given</td>
<td>203 (203) cattle from an unspecified number of infected herds (Se estimation) and 923 (0) cattle from 13 herds free from TB at least 5 years (Sp estimation)</td>
<td>100</td>
<td>87.7</td>
<td>Not evaluated</td>
<td>Monaghan et al. 1997 (Republic of Ireland)</td>
</tr>
<tr>
<td>Not given</td>
<td>Not given</td>
<td>220 (0)</td>
<td>-</td>
<td>100</td>
<td>94.0</td>
<td>Lilienbaum et al. 1999 (Brazil)</td>
</tr>
<tr>
<td>0.3</td>
<td>0.3</td>
<td>232 (218)</td>
<td>57.8</td>
<td>84.9</td>
<td>Not evaluated</td>
<td>González Uramazana et al. 1999 (Spain)</td>
</tr>
<tr>
<td>Not given</td>
<td>Not given</td>
<td>1557 (0) cattle from TB free herds but large reactions to avian PPD</td>
<td>0.0</td>
<td>Not evaluated</td>
<td>88.9</td>
<td>Lauzi et al. 2000 (Italy)</td>
</tr>
<tr>
<td>Not given</td>
<td>Not given</td>
<td>30 zebu oxen (30)</td>
<td>73.3</td>
<td>95.5 87.7</td>
<td>Not evaluated</td>
<td>Ameni et al. 2000 (Ethiopia)</td>
</tr>
<tr>
<td>Not given</td>
<td>Not given</td>
<td>163 (163) SIT and culture positive cattle from 21 herds (Se estimation) and 213 (57) cattle from 82 herds with no evidence of infection, based on testing history and some necropsy results (Sp estimation)</td>
<td>100</td>
<td>85.9</td>
<td>Not evaluated</td>
<td>Ryan et al. 2003 (New Zealand)</td>
</tr>
<tr>
<td>Not given</td>
<td>Not given</td>
<td>68 (68) SICCT confirmed reactors (Se estimation) and 25 (0) SICCT-negative cattle from TB-free herds (Sp estimation)</td>
<td>100</td>
<td>88.2</td>
<td>Not evaluated</td>
<td>Vondermeier et al. 2001 (GB)</td>
</tr>
<tr>
<td>Not given</td>
<td>Not given</td>
<td>30 only (30) SICCT - 10 (Italian PPD)</td>
<td>0.0</td>
<td>Not evaluated</td>
<td>97.3 98.6 (Italian PPD)</td>
<td>Cagola et al. 2004 (Italy)</td>
</tr>
</tbody>
</table>
Appendix E  Proposed conditions for exemption of finishing units from the requirement that incoming cattle should have been pre-movement tested (EFUs)

Conditions of approval
The conditions listed below are aimed at ensuring that the exempt finishing unit for cattle not pre-movement tested (EFU) remains a discrete, self-contained cattle unit clearly isolated from other cattle herds and wildlife. Wildlife in this context refers to species of wild mammals that can act as reservoirs of *M. bovis* (e.g. badgers and wild deer).

Divisional Veterinary Managers (DVMs) can exempt fattening/finishing units from the requirement for incoming cattle to be pre-movement tested if the proposed premises comply with the following conditions:

a) Nose to nose contact with susceptible stock outside of the EFU must be impossible.

b) The cattle in the EFU must be housed or yarded. Wildlife-proof accommodation adequate for the number of cattle in the EFU must be provided.

c) Equipment, machinery, clothing and personnel on the EFU must not be shared with other premises. This applies to other premises owned by the operator of the EFU.

d) There must be facilities for the storage of manure, used bedding and slurry. After removal, manure and slurry should be treated and stored to allow for inactivation of *M. bovis*. The slurry and manure must then be spread on arable land.

e) There must be adequate testing facilities; as a minimum this should incorporate a fixed crush, a sufficiently long race, a collecting yard and a covered testing area.

f) Cattle in the unit must be prevented from having access to watercourses.

g) A system to collect run-off water from the unit that prevents contamination of watercourses is required (see Chapter 5 of the Code of Good Agricultural Practice for the Protection of Water).

h) The EFU will be subject to annual bTB testing and thus all movements from the EFU will be subject to the requirement for pre-movement testing (subject to the exemptions). Whole herd testing will be at the Government’s expense, but the unit operators must satisfy themselves that their LVI practices have the manpower to carry out the tests at the required interval.
Application and Inspection
a) Persons seeking exemption for an EFU should contact the local DVM, who will then provide them with a copy of the application form.

b) On receipt of a completed application and plan of the premises, the DVM will arrange for a VO to inspect the proposed premises. Particular attention will be paid to bio-security and the testing facilities.

c) Following a satisfactory inspection report from a Veterinary Officer (VO), the DVM will inform the applicant in writing of the premises exemption. The letter will contain the conditions of continued exemption.

d) In addition to testing, the premises, records of movements, etc. will be inspected periodically by the SVS. Failure to comply with any of the conditions set out above (including failure to test the cattle on the unit at the prescribed interval) will result in withdrawal of the exemption.

e) EFUs are commercial enterprises and their owners/operators are best placed to promote their commercial activities. It is up to them to negotiate separately any contractual sale and purchase agreements with their potential cattle suppliers and with the slaughterhouses. Upon exemption of an EFU, the owners should be encouraged to register their interest with local farming organisations and advertise on the web, farming press, etc. However, it is not the role of the SVS to publicise or give out the details of a particular EFU. It is for industry stakeholders to update their members on the availability of EFUs for non pre-movement tested cattle.

TB Testing on Exempt Finishing Units for Cattle not Pre-movement Tested:
a) All cattle on the EFU will be subject to annual tuberculin testing.

b) The EFU will retain its Official TB free (OTF) status provided that the annual tests are completed on time and with negative results.

Movements of cattle off the Exempt Finishing Unit for Cattle not Pre-movement Tested
a) Since the EFU will be subject to annual bTB testing, cattle leaving the unit will be subject to a requirement for pre-movement testing, itself subject to the usual exemptions. Movements off will only be permitted to slaughterhouses, dedicated slaughter markets, exempt markets, approved finishing units or other exempt finishing units. The only exception from this restriction will be movement under licence from the DVM on welfare grounds or for other emergency reasons.

Action in the event of a TB incident in the Exempt Finishing Unit for Cattle not Pre-movement Tested
a) Disclosure of reactors or slaughterhouse cases will trigger the same actions as in other herds – ie: serving of TB2 movement restrictions etc. A TB2 stops all movements on and off and will initially be served on the whole premise. It may
be possible to licence animals on or exempt part of the premise, but this will be
done at DVM discretion following a veterinary risk assessment.

b) The usual procedures for removal, post-mortem and notification of reactors
laid down in the SVS Chapter 23 will apply.

c) If TB is confirmed on the EFU, testing of any contiguous premises will be
required. However, DVMs may use discretion to not test contiguous premises if
the isolation and running of the unit leads to the risk of disease spread from the
unit being negligible. In principle, testing should not be necessary, unless the
isolation conditions on the unit have not been complied with and there is potential
for contact with cattle on adjoining premises, with local wildlife or contamination
of the environment with *M. bovis*.

d) Detection of a confirmed bTB incident on an adjoining farm will trigger
additional bTB testing at the EFU.
Appendix F  Approved finishing units for cattle from herds under TB2 restrictions due to a breakdown (AFUs)

Approved bTB finishing units have been established to overcome animal health and welfare issues that can arise when premises are subject to bTB movement restrictions due to breakdowns. If a restricted premises does not have adequate facilities to house and feed the cattle during a breakdown, clear tested animals may be moved to these approved units for fattening.

**Conditions of approval**

The conditions of approval for TB finishing units are similar to those proposed in Appendix E for finishing units for cattle not pre-movement tested although there is a concession that animals may be grazed outside if the finishing unit is located in an parish that is subject to annual routine testing. This concession is made because animals must test clear before they can be sent to TB finishing units after which they are subject to a 90 day testing regime at the units thereby reducing disease risk. With finishing units for cattle not pre-movement tested, the animals will not have been tested so they have an unknown disease status and the requirement is for the unit to test only annually. The associated disease risk makes it unacceptable to approve a grazing concession.

**Conditions of operation**

Unlike finishing units for cattle exempt from the requirement for pre-movement testing, approved TB finishing units are placed under TB movement restrictions. They are subject to TB testing every 90 days and lose their Officially TB free status.

All movements to and from the approved TB unit must be made under licence. Off movements are limited to those direct to slaughter.
Appendix G  Sole Occupancy Authorities

Sole Occupancy Authorities have been established to provide exemption, in some circumstances, from livestock standstill requirements arising under the Disease Control Order (England) 2003.

A Sole Occupancy Authority, formerly known as a Sole Occupancy Licence, may be granted to an individual or business by the SVS where it is agreed, following an inspection by an LVI, that a number of discrete premises are under their common management and control. The collection of premises is then treated as a single premises for the purpose of the Disease Control Order – that is:

- animals may be moved freely between the premises within the SOA without observing standstill requirements;
- movement of animals from outside the SOA onto any of the premises within the SOA prevents animals on all of the premises within the SOA moving to a destination outside the SOA for the appropriate standstill period.

Many thousands of SOAs have been granted.
Appendix H  Existing Animal Health and Welfare enforcement

Local authorities are the statutory enforcement body for Animal Health and Welfare legislation. This function is delivered by County Councils, Unitary authorities, Metropolitan authorities and London Boroughs, and is commonly included within the Trading Standards remit of these bodies.

Local authorities proactively inspect:
- farms;
- livestock markets;
- slaughterhouses;
- animal gatherings;
- vehicles transporting animals;
and enforce a range of legislation while carrying out any such visit.

The focus of local authority enforcement activity is directed through a risk assessment process undertaken in liaison with the relevant Divisional Veterinary Manager. It is supported through the provision, to Local authorities, of a number of IT solutions which provide access to livestock registration and cattle movement data and permit recording of animal movements and enforcement activity.
Appendix I  Stakeholder Group Terms of Reference and membership

To recommend to the CVO and Ministers by the end of 2004 a detailed proposal for implementation in Great Britain by Spring 2005 of pre-movement testing of cattle for bovine TB. The purpose of the measure is to reduce the risk of spread of TB through cattle movements, so contributing to Defra’s Public Service Agreement (PSA) 9 target.

The starting proposal for the Group is as set out in the consultation document i.e. for a legal requirement for pre-movement testing of cattle from 1-2 year testing herds to other herds, with testing provided by Local Veterinary Inspectors and paid for by the herd owner. Cattle moving direct to slaughter, and calves under 6 weeks of age would be exempt.

**Status:** An *ad hoc* advisory group

**Chairman:** Bill Madders (Dairy Farmer and member of the TB strategy core stakeholder group)

**Membership:**

Dairy farming: Tim Brigstocke  
Veterinary profession: Carl Padgett  
Local Authority enforcement: Gwyneth Beddoe  
Meat and livestock sector: Mike Attenborough  
State Veterinary Service: Helen Crea and Rachel Nixon  
Beef farming: Aled Edwards  
Livestock Auctioneer: Ben Messer-Bennetts*

**Official observers:** Welsh Assembly Government and Scottish Executive Officials

Secretariat provided by Defra

* replaced by Chris Dodds for two of the four meetings
## Appendix J  Key evidence submitted to the Group

<table>
<thead>
<tr>
<th>Reference</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRMT 8</td>
<td>Summary of existing cattle movement controls and associated databases</td>
</tr>
<tr>
<td>*PRMT 10</td>
<td>Pre-movement testing – Veterinary advice</td>
</tr>
<tr>
<td>PRMT 11</td>
<td>Minutes from 1st meeting of post-movement testing stakeholder group (29/09/04)</td>
</tr>
<tr>
<td>*PRMT 14</td>
<td>Incidence of bovine tuberculosis in beef and dairy herds in GB</td>
</tr>
<tr>
<td>*PRMT 15, 15a &amp; 15b</td>
<td>Ante-mortem diagnosis of tuberculosis in cattle: the skin and gamma interferon tests</td>
</tr>
<tr>
<td>PRMT 17</td>
<td>Stakeholder views on pre-movement testing (from Defra public consultation)</td>
</tr>
<tr>
<td>*PRMT 35</td>
<td>VLA examples of how cattle movements contribute to TB spread: evidence from North East, Yorkshire and Humber regions</td>
</tr>
<tr>
<td>*PRMT 31 &amp; 31a</td>
<td>Cattle movements to Scotland from high incidence areas in England and Wales: Summary</td>
</tr>
<tr>
<td>PRMT 36</td>
<td>Derivation of TB testing frequencies</td>
</tr>
<tr>
<td>PRMT 37</td>
<td>Independent Scientific Group (ISG) TB99 Farm Survey</td>
</tr>
<tr>
<td>PRMT 42</td>
<td>LACORS delivery proposal for enforcement of pre-movement testing</td>
</tr>
</tbody>
</table>

* Paper either being reworked for publication or not yet published.
## Glossary Of Terms and Abbreviations

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>AFU</td>
<td>Approved Finishing Unit</td>
</tr>
<tr>
<td>AHDO</td>
<td>Animal Health Divisional Office</td>
</tr>
<tr>
<td>AHO</td>
<td>Animal Health Officer</td>
</tr>
<tr>
<td>AHWS</td>
<td>Animal Health &amp; Welfare Strategy</td>
</tr>
<tr>
<td>AHWS</td>
<td>Animal Health &amp; Welfare Strategy</td>
</tr>
<tr>
<td>AMES</td>
<td>Animal Movement Enforcement System</td>
</tr>
<tr>
<td>AMLS</td>
<td>Animal Movements Licensing System</td>
</tr>
<tr>
<td>BCMS</td>
<td>British Cattle Movement Service: organisation established to manage the Cattle Tracing System in Great Britain</td>
</tr>
<tr>
<td>BCVA</td>
<td>British Cattle Veterinary Association</td>
</tr>
<tr>
<td>Biosecurity</td>
<td>A series of measures and protocols designed to prevent the spread of potentially harmful biological agents</td>
</tr>
<tr>
<td>Bovine tuberculosis (bTB)</td>
<td>A disease caused by the mycobacterium <em>M. bovis</em></td>
</tr>
<tr>
<td>Breakdown (or bTB incident)</td>
<td>When one or more reactors are revealed by the tuberculin test, or when disease is suspected in live cattle showing clinical disease or in carcasses with lesions at post-mortem examination</td>
</tr>
<tr>
<td>BVA</td>
<td>British Veterinary Association</td>
</tr>
<tr>
<td>CAP</td>
<td>Common Agricultural Policy</td>
</tr>
<tr>
<td>Cow</td>
<td>A female that has had one or more calves</td>
</tr>
<tr>
<td>CPHH</td>
<td>County Parish Holding Herd Number</td>
</tr>
<tr>
<td>CTS</td>
<td>Cattle tracing system</td>
</tr>
<tr>
<td>Cull cow</td>
<td>A cow that has been removed from the dairy herd or beef breeding herd to be sent to slaughter</td>
</tr>
<tr>
<td>CVO</td>
<td>Chief Veterinary Officer</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Dairy Cow</strong></td>
<td>A cow that is kept mainly for producing milk or rearing calves for a dairy herd</td>
</tr>
<tr>
<td><strong>Dam</strong></td>
<td>Mother of a calf</td>
</tr>
<tr>
<td><strong>Defra</strong></td>
<td>Department for Environment, Food and Rural Affairs</td>
</tr>
<tr>
<td><strong>DVM</strong></td>
<td>Divisional Veterinary Manager</td>
</tr>
<tr>
<td><strong>Endemic disease</strong></td>
<td>A disease present in an animal population in GB on a continuous basis</td>
</tr>
<tr>
<td><strong>EFU</strong></td>
<td>Exempt Finishing Unit – a finishing unit approved for cattle that have not been TB pre-movement tested</td>
</tr>
<tr>
<td><strong>Exempt markets</strong></td>
<td>Markets for cattle that have not been TB pre-movement tested.</td>
</tr>
<tr>
<td><strong>Finishing (or fattening)</strong></td>
<td>The final stage of beef production on a farm, involving appropriate feeding of cattle to produce good quality beef animals for slaughter</td>
</tr>
<tr>
<td><strong>FMD</strong></td>
<td>Foot and mouth disease</td>
</tr>
<tr>
<td><strong>Gamma interferon</strong></td>
<td><strong>g-IFN (IFN(\gamma))</strong> A product of white blood cells generated during an immune response</td>
</tr>
<tr>
<td><strong>Heifer</strong></td>
<td>A female yet to calve</td>
</tr>
<tr>
<td><strong>IR</strong></td>
<td>Inconclusive Reactor</td>
</tr>
<tr>
<td><strong>Incidence</strong></td>
<td>The rate at which new cases of infection arise in a population</td>
</tr>
<tr>
<td><strong>ISG</strong></td>
<td>Independent Scientific Group on Cattle TB</td>
</tr>
<tr>
<td><strong>LA</strong></td>
<td>Local authority</td>
</tr>
<tr>
<td><strong>LAA</strong></td>
<td>Livestock Auctioneers Association</td>
</tr>
<tr>
<td><strong>LACORS</strong></td>
<td>Local Authority Coordinators of Regulatory Services</td>
</tr>
<tr>
<td><strong>LVI</strong></td>
<td>Local Veterinary Inspector</td>
</tr>
<tr>
<td><strong>M. bovis</strong></td>
<td><em>Mycobacterium bovis</em> – bacteria which causes bovine TB</td>
</tr>
<tr>
<td><strong>MDC</strong></td>
<td>Milk Development Council</td>
</tr>
<tr>
<td><strong>MLC</strong></td>
<td>Meat and Livestock Commission</td>
</tr>
<tr>
<td>Acronym</td>
<td>Description</td>
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<tr>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>NBA</td>
<td>National Beef Association</td>
</tr>
<tr>
<td>NFU</td>
<td>National Farmers’ Union</td>
</tr>
<tr>
<td>NVL</td>
<td>No visible lesions on post-mortem examination</td>
</tr>
<tr>
<td>Old</td>
<td>Older animals Cattle over 15 months of age</td>
</tr>
<tr>
<td>OTF</td>
<td>Officially tuberculosis free</td>
</tr>
<tr>
<td>PSA</td>
<td>Public Service Agreement</td>
</tr>
<tr>
<td>Preva</td>
<td>Prevalence The proportion of a population infected at a particular time</td>
</tr>
<tr>
<td>RABDF</td>
<td>Royal Association of British Dairy Farmers</td>
</tr>
<tr>
<td>RADAR</td>
<td>Rapid Analysis and Detection of Animal Risks</td>
</tr>
<tr>
<td>RBCT</td>
<td>Randomised Badger Culling Trial</td>
</tr>
<tr>
<td>RCVS</td>
<td>Royal College of Veterinary Surgeons</td>
</tr>
<tr>
<td>React</td>
<td>Reactor An animal which gives a positive result (i.e. reacts) to the tuberculin test</td>
</tr>
<tr>
<td>Replac</td>
<td>Replacement(s) Cattle bred on farm to replace breeding stock</td>
</tr>
<tr>
<td>RHT</td>
<td>Routine Herd Test</td>
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<td>RIA</td>
<td>Regulatory Impact Assessment</td>
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<tr>
<td>SAHO</td>
<td>Senior Animal Health Officer</td>
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<td>SEERAD</td>
<td>Scottish Executive Environment and Rural Affairs Department</td>
</tr>
<tr>
<td>SOA</td>
<td>Sole Occupancy Authority</td>
</tr>
<tr>
<td>Specifi</td>
<td>Specificity Proportion of uninfected animals correctly identified</td>
</tr>
<tr>
<td>Spol</td>
<td>Spoligotyping A molecular typing technique used to distinguish different strains of the TB organism</td>
</tr>
<tr>
<td>Store</td>
<td>Store Cattle Young beef cattle that are kept on a low maintenance</td>
</tr>
</tbody>
</table>
diet over the winter months in preparation for finishing in the summer

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
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<tbody>
<tr>
<td>Steers (or Bullocks)</td>
<td>Male calves that are raised for beef production and usually castrated at 6 to 12 weeks</td>
</tr>
<tr>
<td>Suckler (or beef cow)</td>
<td>A cow kept mainly for producing and rearing cows for a beef herd</td>
</tr>
<tr>
<td>Suckler calf</td>
<td>The offspring of a suckler cow</td>
</tr>
<tr>
<td>SVS</td>
<td>State Veterinary Service: A GB Wide government Agency operating a network of veterinary, technical and administrative staff</td>
</tr>
<tr>
<td>TB2</td>
<td>Notice prohibiting movement of bovine animals</td>
</tr>
<tr>
<td>TB</td>
<td>Tuberculosis</td>
</tr>
<tr>
<td>Tuberculin</td>
<td>A sterile protein extract derived from the tubercle bacterium, used to diagnose TB in cattle by skin testing</td>
</tr>
<tr>
<td>TVI</td>
<td>Temporary Veterinary Inspector</td>
</tr>
<tr>
<td>Vaccine</td>
<td>That used to prevent disease by stimulation of an immune response to the causative agent</td>
</tr>
<tr>
<td>VeBus</td>
<td>Veterinary e-Business System</td>
</tr>
<tr>
<td>Veterinary Surveillance</td>
<td>Process of collecting information about all aspects of animal health and welfare so as to characterise animal diseases and assess their level and distribution in order that action can be taken if necessary</td>
</tr>
<tr>
<td>VetNet</td>
<td>The State Veterinary Service Animal Health IT System</td>
</tr>
<tr>
<td>VIPER</td>
<td>Veterinary instructions, procedures and emergency routines</td>
</tr>
<tr>
<td>VL</td>
<td>Visible lesion</td>
</tr>
<tr>
<td>VLA</td>
<td>Veterinary Laboratories Agency: Executive agency of DEFRA that provides all sectors of animal health industry with animal disease surveillance, diagnostic services and veterinary scientific research</td>
</tr>
<tr>
<td>VO</td>
<td>Veterinary Officer</td>
</tr>
<tr>
<td>WAG</td>
<td>Welsh Assembly Government</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
</tr>
<tr>
<td>--------------------</td>
<td>---------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>WHT</strong></td>
<td>Whole Herd Test</td>
</tr>
<tr>
<td><strong>Young bulls</strong></td>
<td>Male calves that have not been castrated</td>
</tr>
<tr>
<td><strong>Younger Animals</strong></td>
<td>Cattle between 6 weeks and 15 months of age</td>
</tr>
<tr>
<td><strong>Zoonosis</strong></td>
<td>Disease communicable between animals and man</td>
</tr>
</tbody>
</table>