

Title: Options to increase the chance of achieving Officially TB Free (OTF) status for the TB Low Risk Area IA No: Defra 1786 Lead department or agency: Department for Environment, Food and Rural Affairs Other departments or agencies:	Impact Assessment (IA)		
	Date: 14/01/16		
	Stage: Final		
	Source of intervention: Domestic		
	Type of measure: Secondary legislation		
Contact for enquiries: comms.tb@DEFRA.GSI.GOV.UK			
Summary: Intervention and Options			RPC Opinion: Validated

Cost of Preferred (or more likely) Option			
Total Net Present Value	Business Net Present Value	Net cost to business per year (EANCB on 2009 prices)	In scope of One-In, Two-Out? Measure qualifies as
£-1.24m	£-8.91m	£0.97m	Yes IN

What is the problem under consideration? Why is government intervention necessary?

Government is committed to tackling Bovine Tuberculosis (TB) in line with its 25 year TB Strategy for England. An important interim objective (in advance of eradicating the disease from the whole of the country) is to achieve Official TB free (OTF) status for counties in the north and east of England, designated the TB Low Risk Area (LRA), by 2019.

Freedom from disease is a public good as it is non-excludable and enjoyment by one individual doesn't affect another's. As a consequence the private actions of farmers are likely to be suboptimal in delivering disease freedom. Therefore, government intervention is necessary to achieve OTF status.

What are the policy objectives and the intended effects?

The objective of the policy is to increase the chance of achieving Officially TB Free (OTF) status for the LRA in the quickest possible time, and to encourage more risk-based decision making among cattle keepers, and to protect the current low TB risk status for the area. The intended effects are to:

- Find disease earlier through testing, thus reducing disease control costs to farm businesses (both buyer and seller), and the taxpayer in the medium to long term
- Mitigate the risk of undetected infected cattle being moved into herds in the LRA, thus reducing future disease control costs to farmers in the LRA and the general tax taxpayer.

What policy options have been considered, including any alternatives to regulation? Please justify preferred option (further details in Evidence Base)

1. Introduce post-movement tests for all cattle moved from annually tested areas of England and Wales to the LRA which are not slaughtered within 120 days. This is the preferred option.

Previous experience with a non-mandatory approach to pre-movement testing, which is similar to post-movement testing, suggests that farmers are unlikely to do so voluntarily. Before 2006 owners of cattle herds in some areas where the risk of TB incidence is higher, were urged to pre-movement test their stock – but farmers very rarely did so.

Will the policy be reviewed? It will be reviewed. If applicable, set review date: 04/2021					
Does implementation go beyond minimum EU requirements?			No		
Are any of these organisations in scope? If Micros not exempted set out reason in Evidence Base.	Micro Yes	< 20 Yes	Small Yes	Medium Yes	Large Yes
What is the CO ₂ equivalent change in greenhouse gas emissions? (Million tonnes CO ₂ equivalent)			Traded: N/A		Non-traded: N/A

I have read the Impact Assessment and I am satisfied that (a) it represents a fair and reasonable view of the expected costs, benefits and impact of the policy, and (b) that the benefits justify the costs.

Signed by the responsible Minister: George Eustice Date: 10/3/2016

Summary: Analysis & Evidence

Policy Option 1

Description:

FULL ECONOMIC ASSESSMENT

Price Base Year 2016	PV Base Year 2016	Time Period Years 10	Net Benefit (Present Value (PV)) (£m)		
			Low: £-7.37m	High: £7.29m	Best Estimate: £-1.24m

COSTS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low	N/A	£1.1m	£9.5m
High	N/A	£1.7m	£14.8m
Best Estimate	N/A	£1.5m	£12.6m

Description and scale of key monetised costs by 'main affected groups'

- **Businesses:** cost of post-movement testing (vet fees and productivity impacts) and the cost of switching the buying location of cattle (**£1.4m p.a. / £12.3m PV**).
- **Government:** cost of providing tuberculin for post-movement testing (**£35k p.a. / £295k PV**)

Other key non-monetised costs by 'main affected groups'

- Familiarisation costs, which are assumed to be negligible due to herd owners already having much experience of TB testing.
- There may be a cost to some farmers in the annually-tested areas from trade in cattle movements foregone to the LRA.
- The introduction of post-movement testing may encourage and/or accelerate the establishment of more Licensed Finishing Units (LFUs).

BENEFITS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)
Low	N/A	£0.9m	£7.5m
High	N/A	£2.0m	£16.8m
Best Estimate	N/A	£1.3m	£11.3m

Description and scale of key monetised benefits by 'main affected groups'

- **Businesses:** reduced disease control costs (productivity impact, herd restrictions, economic loss of reactors) due to infected cattle found earlier through post-movement testing and prevented from moving into the LRA (**£340k p.a. / £2.9m PV**). Farmers also benefit from reduced routine surveillance testing once OTF status is achieved in the LRA (**£230k p.a. / £1.9m PV**).
- **Government:** reduced disease control costs, including vet fees, compensation and administration (**£555k p.a. / £4.8m PV**), and reduced cost of routine surveillance testing (**£220k p.a. / £1.8m PV**)

Other key non-monetised benefits by 'main affected groups'

- Farmers, families and local communities benefit from reduced stress of operating businesses under restrictions as well as the emotional impact of losing valued cattle.
- Cattle keepers in the LRA and government benefit through increased potential to trade within the EU and other countries, especially live cattle.
- Some farmers in the LRA could gain from the increased domestic demand for cattle from within the area as a result of animal movements being switched away from the annually tested areas.

Key assumptions/sensitivities/risks (please see **Section 8** and **Annex 1** for further details) **Discount rate (%)** 3.5%

- The number of animal moves into the LRA, the cost of testing and cost of a TB breakdown may vary alongside the level of TB infection pressure.
- Some change in behaviour is likely as farmers become more aware of the risks of moving cattle into the LRA and switch buying location so as to avoid paying testing costs.
- Assessing the reforms over a 20 year appraisal period, in line with the 25 year TB eradication strategy, produces an estimated NPV of £0.28m and an EANCB of £0.97m.

BUSINESS ASSESSMENT (Option 1)

Direct impact on business (Equivalent Annual) £m:			In scope of OITO?	Measure qualifies as
Costs: 1.2	Benefits: 0.3	Net: -1.0	Yes	IN

Evidence Base (for summary sheets)

1. The policy issue and rationale for Government intervention

- 1.1 Bovine Tuberculosis (TB) is a serious infectious disease of cattle; it is one of the most pressing animal health problems facing cattle keepers in England. Over the last decade the TB problem has cost taxpayers £500 million. In 2014 alone TB controls cost nearly £100 million for Defra, with costs to farmers estimated to run to around £75 million a year. In the same year, the number of cattle tests for TB in England was around 6.9 million, leading to the detection of 3,800 new herd TB incidents. This resulted in 2,800 herds being put under restrictions and 26,400 animals slaughtered.¹
- 1.2 The objective of government is to achieve Officially Bovine Tuberculosis Free (OTF) status for England by 2038, in line with its TB Strategy for England² and wider EU-approved UK TB Eradication Programme³. A key aim of this is the interim objective of achieving disease free status for large parts of the north and east of England which make up the TB Low Risk Area (LRA), by 2019.
- 1.3 Securing OTF status for the LRA would provide tangible benefits for the cattle industry, rural communities, wider society and government. These benefits include options to reduce costs of disease control and surveillance for government and industry, and increased ability to trade within the EU and other countries⁴.
- 1.4 The LRA consists of counties (see **Annex 2** for list) with very low TB incidence rates and no known reservoir of TB in wild animals – the majority of herds in this area are routinely tested for TB every four years, although some herds in the LRA are tested annually if they are considered to be at a higher risk of infection⁵. Since 2006, cattle moved from herds under annual surveillance testing must have had a negative pre-movement TB test result within the 60 days preceding the move.
- 1.5 On average, there are over 100 new TB incidents (herd ‘breakdowns’) detected per year in the LRA, of which around 40 contain at least one animal with visible lesions of TB and/or positive bacteriological culture results⁶. TB incidents result in the withdrawal or the suspension of OTF status of the affected herd, depending on whether any lesion or culture positive cattle are found or not respectively. Herd breakdowns in the LRA are estimated to cost the farmer and taxpayer £1.7 million per year⁷. In almost 50% of incidents with OTF status withdrawn (OTFW) in the LRA, there was strong scientific evidence to indicate the breakdown was caused by introductions of cattle (with undetected infection) from annually-tested herds in the higher TB incidence areas of England and Wales. The origin of the remaining OTFW herd breakdowns in the LRA was obscure or could not definitely be ascribed to inward cattle movements and therefore they were deemed ‘indigenous’. Nevertheless, it is likely that a substantial proportion of such incidents of unclear origin was also due to introductions of infected cattle. There is no evidence of TB infected wildlife being the source of these breakdowns of obscure origin occurring in the LRA.
- 1.6 Analysis by the Animal and Plant Health Agency (APHA) demonstrated that if only those TB breakdowns which were found to be indigenous to the LRA are considered, then the annual incidence of new herd breakdowns with OTF status withdrawn in the LRA remained below or equal to 0.1 percent throughout the 6 year period (up to 2014), with the proportion of OTF herds remaining above 99.9 percent⁸. This demonstrates that the LRA region has great potential to gain

¹ Defra, [Latest statistics on the incidence of tuberculosis \(TB\) in cattle in Great Britain](#)

² Defra, [The Strategy for achieving Officially Bovine Tuberculosis Free status for England \(April 2014\)](#)

³ European Commission, [Eradication programme for Bovine Tuberculosis \(United Kingdom\)](#)

⁴ [The World Organisation for Animal Health's \(OIE\)](#) Terrestrial Animal Health Code lays down animal health standards for international trade. These include requirements for qualifying for official freedom from bTB.

⁵ Defra, [2015 TB Testing Intervals Policy \(England\)](#)

⁶ APHA, [Annual surveillance report for England 2014](#). Please see Table 2.1. Figure is average of OTF-W breakdowns between 2012 and 2014, rounded to the nearest 5.

⁷ Average cost a confirmed new incident (breakdown) is around £41k, multiplied by 40 is £1.7 million. Please see **Table 3** for more information.

⁸ Defra, [The Strategy for achieving Officially Bovine Tuberculosis Free status for England \(April 2014\)](#).

OTF status recognition by the European Union Council⁹, which requires the following to be maintained each year for 6 consecutive years:

- the percentage of OTFW herds must not have exceeded 0.1 percent of all herds.
- at least 99.9 percent of herds having achieved OTF status at the end of the year.

- 1.7 Any herd breakdowns cause by infected cattle brought in from the annually tested area¹⁰ risk undermining efforts to achieve this important goal and the benefits it can bring in terms of savings in disease control costs for government and industry, and increased ability to trade within the EU and with other countries.
- 1.8 To achieve this goal, the policy proposal focuses on reducing breakdowns in the LRA by speeding up detection of TB infected cattle through increased surveillance (testing) in cattle. As breakdowns can be traced back to diseased animals coming from the annually-test area, it is important to tackle this source of infection.
- 1.9 The main rationale for government intervention is that the benefits of disease freedom will be freely available to all keepers; however the costs of achieving this are likely to be borne by few. When taking decisions on where to buy cattle, or what biosecurity measures to implement, farmers are likely to only consider their own costs and benefits rather than the benefits to other keepers. As disease freedom is likely to be underprovided if left to the market alone, government intervention is needed to achieve it.

2. Policy objectives and intended effects

- 2.1 The objective of the policy is to minimise the risk of TB increasing and becoming established in the LRA thereby supporting the objective of achieving Officially TB Free (OTF) status for this area. In addition, the policy should encourage farmers to make more risk-based decisions when buying stock.
- 2.2 The primary intended effect is to find disease earlier through testing of high risk animals that enter the LRA to live and thus prevent onward spread of infection in the destination herd and to other cattle herds in the LRA. This will help reduce future additional disease control costs to both farm businesses (testing costs, economic losses of infected cattle that are slaughtered and movement restrictions) and taxpayers (testing costs, compensation payments, administration). Additionally, by gaining OTF status the government may be able to follow Scotland's example and scale back routine surveillance for TB in the LRA of England. Scotland has benefited from OTF status as a UK region since 2009¹¹.
- 2.3 In addition, the policy also supports the longer term challenge of the government's strategy to eradicate TB. Reforms in this area tend to yield benefits which materialise in the long-term rather than immediately. For example, such measures could encourage farmers in other parts of the country to increase their commitment towards TB controls, in order to serve the ultimate aim of disease eradication.

3. Policy options considered, including alternatives to regulation

3.1 Option 1 – Post-movement testing of all cattle moved from annually tested areas of England and Wales to the Low Risk Area which are not slaughtered within 120 days

This option would require post-movement testing of all cattle moved from the annually tested areas of England and Wales to live (i.e. those not slaughtered within 120 days) in the LRA. This post-movement testing will be in addition to the statutory pre-movement test mentioned earlier and it would take place between 60 and 120 days after the movement of cattle. Cattle that do not clear the test would be slaughtered, and there would be movement restrictions and testing of the rest of the herd. Compensation would be paid – using the existing statutory arrangements – for owners of

⁹ European Union, [Council Directive 64/432/EEC](#)

¹⁰ See Annex 2 for list of counties in the annually tested areas

¹¹ [EU Commission Decision 2009/761/EC](#) - declaring that Scotland is Officially Free of Bovine TB.

cattle slaughtered following a positive post-movement test result. This option applies the same rules as those that already operate in Scotland, which allow for routine TB surveillance tests to count as post-movement tests for up to 60 days in a herd, provided that the test complies with the requirements for the movement¹². This is the preferred option.

- 3.2 A second option was assessed in the consultation IA¹³, which proposed to place all herds in the LRA on annual surveillance testing. However, the high cost of the option means that the approach is considered to be disproportionate in achieving the policy objective. Therefore, it is not covered in this document.
- 3.3 Previous experience with a non-regulatory approach to pre-movement testing suggests that farmers are unlikely to voluntarily post-movement test their cattle. Before 2006, owners of herds in the annually-tested areas were urged to pre-movement test their stock – but as farmers very rarely did so, compulsory pre-movement testing was introduced for annually tested herds in England in March 2006. This suggests that an approach which encourages voluntary testing is unlikely to achieve the policy objectives.
- 3.4 A key objective in the TB Eradication Strategy for England is to achieve Official TB Free (OTF) accreditation from the European Commission for the LRA. In doing that Defra is following Scotland’s successful approach. When Scotland was declared OTF in 2009, compulsory post-movement testing had been in force for four years and was one of their key policies, not least because it provided assurance to the EC that proportionate and risk-based controls were in place to protect the OTF status.

4. Application and scope

- 4.1 TB control is a devolved matter. These changes will apply to England only.

5. Costs

Option 1 – Post-movement testing

Monetised Costs

- 5.1 Defra statistics¹⁴ show that, for the period between 2011 and 2013, around 148 thousand animals moved annually on average to the LRA from the annually tested areas of England and Wales. Of these, an estimated 126 thousand stayed on the farms of destination for longer than 120 days and so would be in scope of this policy. For the appraisal period (10 years), the central case assumes that the overall number of animals moved decreases in line with livestock population forecasts (0.6% per annum)¹⁵. The analysis also splits moves into batch type, based on whether animals are moved in **small batches** (*less than 50 animals*) or **large batches** (50 animals or more). The total number of animals moved by batch size in year 1 is shown in **Table 1**.

Table 1: Comparing Cattle Movements by Batch Type (in year 1)

Variable	Batch Type	
	Small	Large
No. of farms receiving animals into LRA from annually tested areas	3,369	116
No. of animals moved to LRA to live (<i>Total</i>)	110,683	15,736
No. of animals moved to LRA to live (<i>net of LFUs</i>)	108,041	13,632
Average batch size	7	69

Source: Defra RADAR Database 2010-2013. It should be noted that the 116 farms that move animals in large batches may also do so in small batches.

¹² APHA, [Pre-movement and post-movement testing of cattle in Great Britain](#)

¹³ Defra, [Impact Assessment “Options to increase the chance of achieving Officially TB Free \(OTF\) status for the TB Low Risk Area”](#)

¹⁴ APHA, Rapid Analysis and Detection of Animal-Related Risks (RADAR) database. Defra analysis of individual cattle movement data between 2011 and 2013

¹⁵ Agri-Food and Biosciences Institute, [FAPRI-UK 2015 Baseline Projections](#)

- 5.2 In addition, the analysis accounts for Licensed Finishing Units (LFUs). An LFU is a facility which provides a route for cattle producers to finish animals sourced from unrestricted (OTF) herds in bio-secure housed units. LFUs may be approved in order to minimise the risk of importing infection into the LRA; it is a requirement that such units cannot include grazing land and can only source cattle from OTF herds, with cattle subject to pre-movement testing when moving from annually tested OTF herds. Cattle in LFUs are exempt from routine and post-movement TB testing because they are subject to strict bio-security rules, are permanently housed and can only be sent directly to slaughter.
- 5.3 There are currently ten LFUs in the LRA, of which nine received an estimated 4,750 cattle to live more than 120 days from the annually tested area in the twelve months to October 2015. Of these cattle, around 2,650 were moved into the LFUs in **small batches** and 2,100 moved in **large batches**¹⁶. These are subtracted from the total number of moves in the baseline as they would be exempt from post-movement testing. This assumes that existing LFUs continue to move animals in these volumes. The net total number of animals moved to the LRA is shown in **Table 1**.
- 5.4 Furthermore, we expect the number of LFUs to increase – in the LRA five new LFUs were set up each year in 2014 and 2015¹⁷. There are already commercial benefits (for some cattle keepers) for operating an LFU – the cattle are not subject to surveillance testing, and if evidence of TB is found in the carcass of an animal sent to slaughter the business can continue to bring in new stock to the Unit. The introduction of mandatory post-movement testing would provide a further incentive for those considering applying to register their business as an LFU. However, due to the uncertainty around the rate of new LFUs being established in future, we use a conservative estimate of two new LFUs per year for the rest of the appraisal period (year 2 onwards). We expect that each new LFU receives around 305 animals to live per year¹⁸, reducing the number of cattle eligible for post-movement testing by this amount. By the end of the appraisal period, this exempts 5,500 cattle annually from post-movement testing.
- 5.5 Moreover, because we expect new LFUs in the baseline, the analysis does not consider the investment in bio-security incurred by farmers to be additional, and is not monetised at this stage. However, investment costs are additional if post-movement testing encourages more LFUs or bring forward the plans of those LFUs assumed in the baseline – this is discussed in paragraph 5.17.
- 5.6 In the baseline (do nothing scenario), farmers in the LRA continue to import animals from the annually tested areas and are not required to post-movement test.
- 5.7 Under option 1, post-movement testing is mandatory for all farms in the LRA, with the exception of LFUs. Farmers would be responsible for arranging and paying the costs of skin testing of all cattle moved from annually tested herds in England and Wales to live (i.e. not slaughtered within 120 days) in the LRA. As a result, post-movement testing imposes two direct costs on farmers in the form of vet fees and labour productivity loss, the latter accounting for time spent by a farmer gathering and presenting animals for testing.
- 5.8 In the consultation IA the underlying data for vet fees was based on Local Veterinary Inspector (LVI) survey data¹⁹, but we have since received updated data based on fees charged by Veterinary Delivery Partnerships²⁰ (VDPs) for TB tests paid by government. These prices are lower than the LVI survey rates. Given these prices have been recently competitively tendered they are likely to more accurately reflect current market prices. However, APHA is a large procurer of veterinary services and so likely to achieve more competitive rates than individual farmers. Issues relating to the cost of government and privately funded tests were raised by the National Farmers Union

¹⁶ APHA, RADAR Database

¹⁷ APHA, SAM Database

¹⁸ APHA, RADAR Database. Defra analysis of individual cattle movement data between 2011 and 2013. The figure (305) is the average number of animals moved per holding across all batch sizes, and equates to 169 and 136 animals in **small** and **large batches** respectively.

¹⁹ Defra, [Pre-movement testing review \(2010\)](#), table 14, page 90

²⁰ From 1 April 2015 in Wales and 1 May 2015 in England, APHA manage TB testing and other veterinary services in England and Wales through suppliers known as Veterinary Delivery Partnerships (VDPs). More information on VDPs can be found [here](#).

(NFU) as part of their consultation response²¹. Therefore, the central case assumes that vet fees for post-movement testing is an average of LVI and VDP cost data with the full range reflecting the two sources of prices. A further assumption is that testing large batches is significantly cheaper per animal due to economies of scale.

- 5.9 For government, the only cost of post-movement testing is to supply tuberculin used in the testing of cattle.
- 5.10 Part of the rationale for post-movement testing is to promote risk-based decision making among farmers. In Scotland, the introduction of pre and post-movement testing in 2005 led to a 34% reduction in the proportion of moves originating from the annually tested areas of England and Wales.
- 5.11 To reflect the potential behavioural response of farmers in the LRA switching the buying location of their cattle from the annually tested areas to LRA, a range of 0-34% is used for sensitivity analysis, with the midpoint of 17% used in the central case. The midpoint reflects the uncertainty around the relative contributions of pre and post movement testing on the behavioural effect seen in Scotland, given that the policies were introduced at the same time.
- 5.12 The cost of switching imposes an indirect cost on farmers, due to it being a behavioural response (second-order impact) to post-movement testing. Farmers that switch buying location are likely to incur costs such as time spent searching for replacements, or if alternative cattle are more expensive than previously. It is logical to assume that these costs would be less than the costs of testing; otherwise farmers are less likely to choose to switch and instead incur the cost of post-movement testing. It is also possible that some farmers that switch may incur no additional cost or experience one-off costs only.
- 5.13 While there is no data on the cost of switching to inform an estimate, to illustrate its potential impact on the overall net benefit of this policy we assume it is approximately half of the cost of testing cattle, and that this cost is ongoing. The analysis also assumes that farms that move cattle in **large batches** do not switch-buying location, due to the potential difficulties of finding alternative large quantities of cattle, the relatively lower cost of testing due to economies of scale, and the potential for them to become an LFU.
- 5.14 **Table 2** provides the central case estimates of the costs to government and to farmers of post movement testing, as well as the number of animals tested and switched. The table shows that, in year 1, the total cost to government is estimated at £35k while the cost to farmers is £1.5m, affecting around 3,500 farm businesses.

²¹ Defra, [Improving Bovine TB controls: post-movement testing of cattle in England - A summary of responses to the consultation exercise and way forward](#)

Table 2: Summary of Costs of Post-Movement Testing (in year 1)

	TOTAL		SMALL BATCHES		LARGE BATCHES	
	Number of Animals (thousands)	Cost (£thousands)	Number of Animals	Cost	Number of Animals	Cost
GOVERNMENT						
Post Movement Testing (Tuberculin)	103	35	90	30	14	5
FARMERS (of which)	122	1,490	108	1,390	14	100
Post Movement Testing (Vet fees and labour productivity loss)	103	1,360	90	1,260	14	100
Cost of Switching Buying Location	18	130	18	130	NO SWITCHING BEHAVIOUR	
TOTAL COST (Year 1)		1,525		1,420		105
TOTAL COST (Average Annual)		1,460		1,365		90

Notes: average annual costs are less than those in year 1 due to the profile of cattle movements described **earlier in this section** (please see 5.1 to 5.4). Costs are rounded to the nearest 5, and constituent parts will not necessarily add up to totals due to rounding.

Non-Monetised Costs

- 5.15 There may be some familiarisation costs to businesses, which are assumed to be negligible. This is due to herd owners having had much experience of TB testing.
- 5.16 There may be a cost to some farmers in the annually-tested areas in the way of loss of trade in cattle movements to the LRA (those cattle that are now sourced from the LRA). This cost is considered to be negligible as analysis of cattle movements data suggests this would affect less than 1% of the total cattle moved from herds in the annually tested areas each year²².
- 5.17 The introduction of post-movement testing may encourage more LFUs or bring forward the plans of those LFUs assumed in the baseline. However, without any firm evidence this potential is not quantified.

6. Benefits

Option 1 – Post-movement testing

Monetised Benefits: (1) Reduced Disease Control Costs

- 6.1 The benefit of this measure is to prevent disease spread within and between cattle herds, and reduce the associated disease control costs to government and economic losses to farmers. There will be benefits to cattle keepers in the LRA and government from:
- reduced costs of breakdowns from reactors (cattle that react positively to a TB diagnostic test) found earlier by post-movement testing;
 - avoiding costs of new cases of TB breakdowns arising from cattle no longer bought from the annually-tested areas; and
 - reduced risk of spread of TB into neighbouring herds within the LRA.

²² APHA, RADAR Database. Defra analysis of individual cattle movements data. The estimated 18 thousand cattle switched (i.e. no longer bought) from the annually tested areas (see **Table 2**) would represent less than 1 per cent of the total 3.5million cattle moves of the area.

- 6.2 Where post-movement testing discloses a reactor, this may require further testing and restrictions on the originating farm in the annually tested areas. This analysis assumes that any costs this results in are not additional because:
- When disease is disclosed under business as usual, tracing the source of infection would require checks on farms where cattle have moved from and would likely be more time consuming and costly than under option 1 as more time would have elapsed.
 - There is a strong chance that the originating farm has a hidden source of infection. Under business as usual this would likely be revealed at a future point in time when disease has had a chance to spread. Option 1 is likely to reduce the risk of disease spreading further by increasing surveillance for farms selling cattle to farms in the LRA.
- 6.3 In order to establish the benefits to business and government, the following needs to be estimated:
- the cost of a breakdown under the baseline and under option 1 (*paragraphs 6.5 to 6.16*).
 - the within-herd benefits under option 1 (*paragraphs 6.17 to 6.24*), by finding the number of reactors:
 - found earlier by post-movement testing; and
 - prevented from moving into the LRA which would have resulted in breakdowns.
 - the between-herd benefits under option 1 (*paragraphs 6.25 to 6.27*), in which finding reactors earlier or preventing them from moving reduces the risk of “hotspots” developing. This is where disease spills over to neighbouring farms and wildlife.
- 6.4 It should be noted that the profile of cattle movements for calculating the benefits is the same as described in **Section 5**²³. In summary, under the baseline and option 1, the number of cattle decreases due to forecasted changes in livestock population, and new LFUs exempting 5,500 animals from post-movement testing annually by the end of the appraisal period.

Estimating the cost of a breakdown under the baseline and option 1

- 6.5 In the baseline, farms in the LRA continue to import animals from the annually tested areas, causing breakdowns and hotspots due to the movement of infected cattle, spreading the disease within and between herds.
- 6.6 For the purpose of the analysis, a breakdown under the baseline scenario is known as a **full breakdown**. A breakdown is when a cattle herd found to have TB has its officially TB free status withdrawn (OTFW) and undergoes a series of disease control measures until disease-free status is regained²⁴. The main control actions involve restricting movements of cattle from the herd, whole herd testing of the cattle, slaughter of any cattle that react to the test and repeated testing (known as *short interval testing*) and slaughter of any additional reactors until the herd is cleared. In the LRA this also includes the additional use of the more sensitive gamma interferon blood test on the breakdown herd. In the central case, we assume the size of the herd is 213, which is the average size of a breakdown herd in the LRA²⁵.
- 6.7 In addition to the costs of control measures on the breakdown farm, there is the cost of radial testing all neighbouring herds within a 3km radius of an OTFW herd incident. Any affected herds undergo control measures similar to the breakdown farm. In the central case we assume the size of neighbouring herds is 96²⁶, which is the average size of herds in the LRA.
- 6.8 A distinction is made between the average size of the breakdown and neighbouring herds, because larger herds are more vulnerable to breakdowns. The latest data shows that the likelihood of a TB incident increases with herd size²⁷.
- 6.9 The analysis assumes that any breakdowns resulting from radial testing on neighbouring farms are less severe compared to the breakdown farm, and are therefore classed as OTFS (officially TB

²³ Please see paragraphs 5.1 to 5.5 for details.

²⁴ Further details of what happens when officially TB free status is withdrawn can be found [here](#).

²⁵ APHA, SAM Database 2013

²⁶ APHA, SAM Database 2014

²⁷ APHA, [Annual surveillance report for England 2014](#). In the linked report, please see Table A1.3.

free suspended) as opposed to OTFW. This is because the data shows that in the LRA, twice as many OTFS breakdowns occur compared to OTFW²⁸.

- 6.10 Under OTFS breakdowns, herds are under movement restrictions for less time²⁹, less TB reactors tend to be slaughtered³⁰, and the gamma interferon blood test is not used³¹. In addition, Defra analysis estimates that the probability of finding a reactor in an OTFS breakdown is 0.380³². For the analysis, this probability is multiplied by the associated disease control costs for the neighbouring breakdown farm.
- 6.11 Under option 1, post-movement testing of cattle entering the LRA affects the cost of a breakdown compared to the baseline in two ways:
- Reduced costs of breakdowns from reactors found earlier by post-movement testing.
 - Avoided costs of new TB breakdown cases arising from cattle no longer bought from the annually-tested areas.
- 6.12 For the purpose of the analysis, a breakdown under the option 1 is known as a **reduced breakdown**. Compared to a **full breakdown**, we assume the breakdown farm has fewer reactors and herds under restriction for a shorter duration. This is because infected animals would have been detected earlier due to post-movement testing, and would have less time to infect the rest of the herd.
- 6.13 Similarly, detecting reactors earlier by post-movement testing means that there is a reduced risk of onward infection for the neighbouring herds. Veterinary advice is that in 80% of cases, APHA vets are likely to waive the radial area tests around the infected premises and additional TB testing of neighbouring herds due to the earlier detection of disease through post-movement testing. Therefore, we assume a **reduced breakdown** incurs 20% of the diseases control costs experienced under a **full breakdown**.
- 6.14 For the breakdown farm, the cost of short interval testing is government funded, and includes vet fees for skin testing and gamma testing³³. Government is also responsible for the cost of dealing with reactors, which includes compensation payments for farmers (net of salvage) and slaughter related activities. Similarly, the neighbouring farm imposes radial testing and administration costs to government, as well as the associated costs of dealing with any reactors identified.
- 6.15 For the breakdown farm, the main cost imposed to farmers is the economic loss (net of compensation payment) and isolation of any reactors, movement restriction of the whole herd, and productivity loss from repeated short interval testing. In addition, neighbouring herds experience productivity loss from radial testing, as well as the associated breakdown costs if any reactors are detected.
- 6.16 **Table 3a** presents the assumptions and figures for **full** and **reduced breakdowns**, as well as the cost to farmers and government. **Table 3b** presents the net cost of a **reduced breakdown** to farmers. **Annex 1** provides details and sources of all the underlying figures.

²⁸ APHA, Radial Testing Statistics in 2013 and 2014.

²⁹ APHA, [Annual surveillance report for England 2014](#). In the linked report, please see Table 4.1a and Table 4.1b .

³⁰ APHA, [Annual surveillance report for England 2014](#). In the linked report, Please see Table 4.3a and Table 4.3b .

³¹ APHA procedure for OTFS breakdowns as set out in the APHA ops manual

³² APHA, Radial Testing Statistics in 2013 and 2014.

³³ Vet fees for skin tests are charged at rates set by VDPs, while APHA fund and administer gamma tests.

Table 3a: Cost of Full and Reduced Breakdowns (Detail, Central Case)

	Full Breakdown (baseline)		Reduced Breakdown (option 1)	
	Average Units	Cost (£)	Average Units	Cost (£)
BREAKDOWN FARM		18,670		13,230
GOVERNMENT (of which)		12,665		9,465
Cost of short interval testing (skin & gamma) and administration	3.16 tests, 213 animals	8,550	3.16 tests, 213 animals	8,550
Net compensation for reactors	4.5 reactors	3,560	1 reactor	790
Reactor Costs ¹	4.5 reactors	555	1 reactor	125
FARMERS (of which)		6,005		3,765
Productivity loss from testing	3.16 tests, 213 animals	3,030	3.16 tests, 213 animals	3,030
Movement Restrictions	237 days, 213 animals	180	150 days, 213 animals	115
Isolating Reactors	14.5 days, 4.5 reactors	100	14.5 days, 1 reactor	20
Net Economic Loss from Reactors	4.5 reactors	2,695	1 reactor	600
NEIGHBOURING FARM²		22,955		4,590
GOVERNMENT (of which)		13,765		2,755
Cost of radial testing, short interval testing and administration	Please see note 2	13,420	Cost to the neighbouring farm under a reduced breakdown is assumed to be 20% of the full breakdown costs.	1,835
Net compensation for reactors	1 reactor	300		
Reactor Costs ³	1 reactor	45		
FARMERS (of which)		9,185		
Productivity loss from radial and short interval testing	Please see note 2	8,915		
Movement Restrictions	127 days, 96 animals	35		
Isolating Reactors	14.5 days, 1 reactor	<10		
Net Economic Loss from Reactors	1 reactor	230		

Notes: costs are in year 1 of the appraisal period. Figures are rounded to the nearest 5, and constituent parts will not necessarily add up to totals due to rounding. ¹includes costs of slaughter, haulage, disposal, post-mortem and culture charges. ²Associated costs of breakdowns in neighbouring farms multiplied by the probability of detecting a reactor in an OTFS herd (0.380). ³includes 2,572 radial tests on animals in neighbouring herds, and 1 short interval test for the breakdown radial farm assuming the radial test detects the reactor.

Table 3b: Cost of Full and Reduced Breakdowns (Summary, Central Case)

	Full Breakdown	Reduced Breakdown	Reduced-Breakdown (Net Benefit)
TOTAL (£, of which)	41,600	17,800	23,800
Government	26,400	12,200	14,200
Farmers	15,200	5,600	9,600

Estimating the within-herd benefits of reduced breakdown costs due to infected cattle being found earlier and prevented from moving due to post-movement testing

- 6.17 There are within-herd benefits that accrue from infected cattle being prevented from moving into the LRA, or being caught earlier by post-movement testing. These involve reduced breakdown costs for infected cattle that are caught earlier, and avoided breakdown costs from cattle that are prevented from moving.
- 6.18 The number of reactors found by post-movement testing or prevented from moving into the LRA will depend on the probability of infection and the amount disease actually found. There has been an overall long-term upward trend in the incidence of TB in cattle herds over the last 20 years in Great Britain, but the latest statistics show that the incidence rate is now lower than it was at its peak in 2008³⁴. Without any robust evidence on future levels of TB, therefore, this analysis

³⁴ Defra, [Latest statistics on the incidence of tuberculosis \(TB\) in cattle in Great Britain](#)

assumes constant rates of disease over the next 10 years. Using Defra statistics³⁵ we have applied sensitivity around this, set to 2% based on the annual rate of change in the number of reactors slaughtered in the annually tested areas between 2008 and 2013.

- 6.19 The number of reactors found or prevented from moving into the LRA is estimated using data on the detection rate of post-movement testing in Scotland, where testing is carried out on cattle moved from annually tested areas of England and Wales. For the years 2005 to 2011 the rate of detection has been 20% of that of pre-movement testing. A rate of 26 reactors per 100,000 animal post-movement tests is used in this analysis³⁶.
- 6.20 A 'batch factor' of 0.93³⁷ is then applied to the number of reactors to take account of the possibility that some reactors may have been moved onto the same farm which would result in over-counting of new TB incidents/breakdowns. Multiplying the numbers of cattle moved or switched from the annually tested areas by the detection rate and the batch factor gives an estimate of the expected number of breakdowns occurring from cattle moved or breakdowns avoided from cattle switched in the LRA.
- 6.21 In the baseline, 122 thousand animals move from the annually tested areas to the LRA in year 1. Under option 1:
- 103 thousand animals are moved from the annually tested area, resulting in 25 **reduced breakdowns** due to reactors being found earlier by post-movement testing.
 - 18 thousand animals are switched from the annually tested area, avoiding an estimated 5 **full breakdowns** which would have otherwise occurred in the LRA.
- 6.22 As shown in **Table 3b**, the net benefit of a **reduced breakdown** (£23.8k) reflects reduced costs of breakdowns from reactors found earlier by post-movement testing, and is therefore a direct benefit. For each **reduced breakdown**, the benefit to government and farmers is £14.2k and £9.6k respectively.
- 6.23 The benefits of avoided **full breakdowns** (£41.6k) due to cattle prevented from moving into the LRA due to switching are indirect, because it results from a behavioural response to post-movement testing. **Table 3b** shows that for each breakdown avoided, the benefit to government and farmers is £26.4k and £15.2k respectively.
- 6.24 **Table 4** presents a summary of the within-herd benefits of reduced breakdown costs to government and to farmers.

Table 4: Within-herd benefits of post-movement testing (in year 1)

	Total Benefit <i>(£thousands, constant prices)</i>
GOVERNMENT <i>(of which)</i>	500
<i>Reactors found earlier by post-movement testing</i>	385
<i>Reactors prevented from moving due to switching behaviour</i>	120
FARMERS <i>(of which)</i>	310
<i>Reactors found earlier by post-movement testing</i>	240
<i>Reactors prevented from moving due to switching behaviour</i>	70
TOTAL (Year 1)	805
TOTAL (Average Annual)	785

Notes: average annual benefits are less than those in year 1 due to the profile of cattle movements described in **Section 5** (please see 5.1 to 5.4). Figures are rounded to the nearest 5, and constituent parts will not necessarily add up to totals due to rounding.

³⁵ Defra, [Latest statistics on the incidence of tuberculosis \(TB\) in cattle in Great Britain](#)

³⁶ Please see **Annex 1** for how this figure is derived.

³⁷ Defra, [Pre-movement testing review 2010](#)

Estimating the between-herd benefits of reduced breakdown costs due to reduced controlled and uncontrolled hotspot risk

- 6.25 There are between-herd benefits that accrue from infected cattle being prevented from moving into the LRA, or being caught earlier by post-movement testing. This is particularly important where animals are moved into relatively disease-free areas.
- 6.26 According to the pre-movement testing Regulatory Impact Assessment³⁸ there is a small chance (2%) that moving infected animals into new areas could lead to a ‘controlled hotspot’. This is where disease spills over into around 4 neighbouring herds with associated disease control costs. There is also a very small risk (0.01%) that this could result in an ‘uncontrolled hotspot’ where around 100 herds are affected.
- 6.27 By finding and removing those reactors identified by post-movement testing (25 reactors in year 1), or switching to buying cattle within the LRA (5) the policy should reduce the risk of TB hotspots in the LRA. Combining these with the probability and their respective costs provide estimated benefits in terms of reduced disease control costs. We assume that the avoided disease control costs are equivalent to the cost of a **full breakdown** (see **Table 3b**). In addition, as discussed in paragraphs 6.22 and 6.23, reduced breakdown costs due to reactors found earlier yields direct benefits, while indirect benefits occur when reactors are prevented from moving into the LRA. The between-herd benefits are shown in **Table 5**.

Table 5: Between-herd benefits of post-movement testing (in year 1)

	Total Benefit <i>(£thousands, constant prices)</i>
GOVERNMENT (of which)	70
Controlled Hotspots	60
Uncontrolled Hotspots	10
FARMERS (of which)	40
Controlled Hotspots	35
Uncontrolled Hotspots	5
TOTAL (Year 1)	110
TOTAL (Average Annual)	105

Notes: average annual benefits are less than those in year 1 due to the profile of cattle movements described in **Section 5** (please see 5.1 to 5.4). Figures are rounded to the nearest 5, and constituent parts will not necessarily add up to totals due to rounding.

Reduced Disease Control Costs: Summary of Benefits

- 6.28 **Table 6** summarises the average annual benefits of post-movement testing to government and to farmers, broken down by within and between-herd benefits. As shown, the overall within-herd benefits (£810k) are significantly greater than those between-herd (£110k), while benefits to government are greater than to farmers because it bears the cost of breakdown testing. In the LRA there are around 19,500 farm businesses³⁹ that will benefit from reduced disease control costs in some capacity, with farms vulnerable to breakdowns and those neighbouring them likely to benefit the most.

³⁸ Defra, [Regulatory Impact Assessment: Pre-Movement Testing in England 2005](#)

³⁹ APHA, RADAR Database 2013

Table 6: Within and Between Herd Benefits of Post Movement Testing
(in year 1)

	Total Benefit (£thousands, constant prices)
GOVERNMENT (of which)	570
Within-herd	500
Between-herds	70
FARMERS (of which)	350
Within-herd	310
Between-herds	40
TOTAL (Year 1)	925
TOTAL (Average Annual)	890

Notes: average annual benefits are less than those in year 1 due to the profile of cattle movements described in **Section 5** (please see 5.1 to 5.4). Figures are rounded to the nearest 5, and constituent parts will not necessarily add up to totals due to rounding.

Monetised Benefits: (2) Achieving OTF Status in the LRA

- 6.29 Achieving OTF status for the LRA in the quickest possible time will provide options to reduce the surveillance testing regime, thereby reducing costs to government and farmers. This would be following Scotland's approach, which after achieving OTF status in 2009, introduced surveillance testing exemptions in 2012 as part of a package of risk-based surveillance measures. The policy currently exempts around 45% of herds in Scotland from routine four-yearly testing⁴⁰.
- 6.30 In the baseline, it is assumed that the current surveillance regime in the LRA continues (i.e. most herds are tested every four-years). This implies that 25% of LRA herds are tested in any given year. However, some herds in the LRA are tested more frequently if they are considered to be at a higher risk of infection, or if they are within a 3km radius of a new OTF breakdown⁴¹. Therefore, it is likely that less than 25% of herds undergo a routine surveillance test only. To account for this, the analysis assumes a routine surveillance rate of 20% of herds per year.
- 6.31 Under option 1, a proportion of herds would be exempt from all TB testing. The central case assumes, following vet advice, that the policy is introduced in 2019, assuming that the European Commission will grant regional OTF status for the LRA by the same year. Similar to what happened in Scotland, 35% of herds are exempt initially, with the central case assuming that this increases gradually by 5 percentage points per annum in subsequent years⁴². The analysis also applies a maximum exemption rate of 60%, to account for the fact that high risk herds will continue to be tested more frequently, and that the policy is not expected to exempt all herds from routine surveillance testing during the appraisal period.
- 6.32 In the LRA there are nearly 21 thousand herds⁴³, and an average of 49 animals are tested in a routine surveillance test⁴⁴. **Table 7** presents a comparison of the number of herds surveillance tested in year 1, year 4 (reduced surveillance testing is introduced) and year 10 (final year of the appraisal period) under the baseline and option 1. The central case assumes that the number of herds in the LRA decrease in line with livestock population forecasts (0.6% per annum)⁴⁵.

⁴⁰ Please see the **Annex 3** for more information.

⁴¹ Defra, [2015 TB Testing Intervals Policy \(England\)](#)

⁴² Please see the **Annex 3** for more information.

⁴³ APHA, [Annual surveillance report for England 2014](#). Table 1.2 (number of unrestricted herds).

⁴⁴ APHA, SAM Database 2013

⁴⁵ Agri-Food and Biosciences Institute, [FAPRI-UK 2015 Baseline Projections](#)

Table 7: Number of Herds Surveillance Tested in the LRA

	Year 1	Year 4	Year 10
Number of herds	20,907	20,563	19,893
Number of herds tested (baseline)	4,181	4,113	3,979
Number of herds tested (option 1)	4,181	2,673	1,591
Exemption Rate	0%	35%	60%

- 6.33 As shown by **Table 7**, the smaller number of herds which are surveillance tested under option 1 compared to the baseline means government and farmers benefit through lower surveillance testing costs. These benefits would be indirect because post-movement testing contributes to the overarching objective of achieving OTF status in the LRA, which would allow government to reduce routine surveillance testing. Government are responsible for paying the cost of testing, which includes vet fees and tuberculin, so government makes savings in these areas. Reduced surveillance also reduces the productivity loss to farmers.
- 6.34 **Table 8** presents the average annual benefits to government and to farmers of reducing surveillance testing. We estimate up to 7 thousand farm businesses will benefit in year 4, and up to 12 thousand in year 10⁴⁶.

Table 8: Benefits of Reducing Surveillance Testing

	Average Annual Benefit (£thousands, constant prices)	
	Whole Appraisal Period	From Year 4 (reduced surveillance introduced)
Government <i>Vet Fees and Tuberculin</i>	220	315
Farmers <i>Labour Productivity Loss</i>	230	330
TOTAL	450	645

Notes: *Appraisal Period* - divides the total benefit by 10. *From Year 4* - divides total benefit by 7, given reduced surveillance testing is introduced in year 4 of the appraisal period. Figures are rounded to the nearest 5, and constituent parts will not necessarily add up to totals due to rounding.

Non-Monetised Benefits

- 6.35 Recognition of OTF status at the regional level could increase access to international export markets for live cattle. In 2009, analysis by the Scottish Government suggested that OTF status for Scotland could lead to an annual benefit of up to £234,000 by way of increased exports of dairy bull calves. However, analysis of cattle movements data show that exports of live cattle from GB have been at low levels since 2009, suggesting that these benefits have not yet been realised.
- 6.36 England has the highest rate of TB in the EU. The EC are co-financing our accelerated TB eradication plan to help us move towards OTF status. The Commission has allocated considerable funds to co-finance the UK TB programmes since 2010 and expects significant improvements in the disease situation. This will be particularly important in securing ongoing EU co-financing. The introduction of post-movement testing to improve the prospect of achieving OTF status for the LRA would provide further evidence of UK progress on, and commitment to, eradicating the disease. A possible consequence is that it could encourage farmers in other parts of the country to increase their commitment towards TB controls, in order to serve the ultimate aim of disease eradication.

⁴⁶In the LRA, the number of farm businesses (19,500) is similar to the number of herds (20,900). Therefore, multiplying the number of farms by 35% and 60% provides an estimate on how many farms may benefit from reduced surveillance in year 4 (6,800) and year 10 (11,700) respectively. This calculation does not account for farms that would not be exempted from routine surveillance, as high risk herds will continue to be tested more frequently.

- 6.37 Cattle farmers would face reduced stress of operating businesses under restrictions as well as the emotional impact of losing valued cattle. While qualitative evidence exists in this area⁴⁷, the impacts are difficult to quantify or value.
- 6.38 There may be a benefit to some farmers in the LRA who gain from increased domestic demand for cattle from within the area as a result of animal movements being switched away from the annually tested area.
- 6.39 Cattle over 42 days old exported to other Member States for breeding or production do not require a negative pre-movement test in the last 30 days if they come from an OTF Member State or region. Farmers, who are responsible for funding and arranging pre-export tests, could take advantage of this once OTF status is achieved in the LRA and save money on the costs of testing. However, the benefits are likely to be insignificant given 362 animals had pre-export tests in 2013⁴⁸, and are therefore not quantified here.

7. Cost-benefit analysis

Option 1 – Post Movement Testing

- 7.1 Cost-benefit analysis estimates the measure is likely to produce a total net cost of £1.24m in the central case, with an average annual cost of £110k. The measure is a net benefit to government (£740k per annum), but imposes a net cost to business of around £850k per year. **Table 9** presents a summary of the cost-benefit analysis. However, as shown by **Table 14a** (see **Annex 4**), the policy produces a net benefit overall from year 6 onwards, increasing from £34k to £253k by year 10.

Table 9: Summary of Cost and Benefits (*central case*)

	Average Annual (£thousands, constant prices)			Total PV (£thousands)		
	Government	Business	Overall	Government	Business	Overall
COSTS	35	1,425	1,460	295	12,285	12,585
<i>Post-Movement Testing</i>						
BENEFITS (<i>of which</i>)	775	570	1,345	6,550	4,790	11,345
<i>Reduced Breakdowns and Hotspots</i>	555	340	895	4,775	2,930	7,700
<i>Reduced Surveillance</i>	220	230	450	1,780	1,865	3,645
NET BENEFIT¹	740	-850	-110	6,255	-7,495	-1,240

Notes: Figures are rounded to the nearest 5, and constituent parts will not necessarily add up to totals due to rounding. ¹figures include all direct and indirect costs and benefits, which mean the net benefit (average annual and total PV) to business are not equivalent to those presented on page 1. **Businesses Net Present Value** accounts for direct costs and benefits only, while **net cost to business per year** is calculated in 2014 prices and 2015 present value. The figures presented here are in 2016 prices and present value.

- 7.2 **Table 10a** provides a summary of the direct and indirect costs to business, and shows that over 90% of the costs imposed on businesses are direct.

⁴⁷ Defra, [Impact Assessment "Measures to address bovine TB in badgers"](#). Please paragraph 6.47

⁴⁸ Defra, SAM Database

Table 10a: Summary of Direct and Indirect Impacts on Business

	Average Annual (£thousands, constant prices)	Total PV (£thousands)
COSTS (of which)	1,425	12,285
Direct (Post Movement Testing)	1,300	11,215
Indirect (Switching Buying Location)	125	1,070
BENEFITS (of which)	570	4,790
Direct (Reduced Breakdowns and Hotspots due to Post Movement Testing)	270	2,310
Indirect (of which)	305	2,485
Reduced Breakdowns and Hotspots due to Switching Buying Location	70	620
Reduced Surveillance	230	1,865
NET BENEFIT (Overall)	-850	-7,495
NET BENEFIT (Direct costs and benefits only)	-1,030 ¹	-8,905

Notes: Constituent parts will not necessarily add up to totals due to rounding. ¹figure differs slightly from the equivalent annual net cost to business (EANCB) given on page 1 (£0.97m), because it is calculated based on 2014 prices and 2015 present value. The figures presented here are in 2016 prices and present value.

7.3 **Table 10b**, provides a breakdown of direct and indirect costs by farms that move animals in **small batches** (less than 50 animals) and **large batches** (50 animals or more). As shown, the direct costs are significantly higher for farms that move animals in **large batches**.

Table 10b: Breakdown of Direct and Indirect Costs (in year 1, by batch size)

	Number of Farms	Direct (Post-Movement Testing Costs)	Indirect (Switching Buying Location)
All Farms (£m, constant prices)		1.36	0.13
Per Farm (£, constant prices)	3,485	390	
Small (Batch size < 50)	3,369	375	40
Large (Batch Size > 50)	116	845	No switching behaviour.

Notes: total year 1 costs (£1.48m) are greater than average annual (£1.43m) shown in **Table 10a** due to profile of cattle movements described in **Section 5** (please see 5.1 to 5.4). Figures are rounded to the nearest 5, and constituent parts will not necessarily add up to totals due to rounding. It should be noted that the 116 farms that move animals in large batches may also do so in small batches.

8. Risks and Sensitivity Testing

8.1 **Table 11** presents a summary of the sensitivity testing. As shown, there is a net benefit to government and a net cost to business across all scenarios. However, there is a net benefit of the measure overall in the best case. Paragraphs 8.2 to 8.11 provide a detailed discussion of the sensitivity testing.

Table 11: Sensitivity Testing Summary

Variable	Scenario		
	Worst	Central	Best
Post Movement Testing (Cost)			
Cost of Post Movement Testing	LVI	Midpoint	VDP
Switching Buying Location	0%	17%	34%
Costs of Switching	10%	0%	-10%
Avoided Breakdown Costs (Benefit)			
Annual change in TB reactors slaughtered	-2%	0%	2%
Neighbouring Herd Control Costs	40%	20%	0%
Breakdown Costs	-10%	0%	10%
Number of Reactors Per OTFW (LRA)	2.0	4.5	9.0
Surveillance Testing Exemption (Benefit)			
Exemption Rate Increases (percentage points)	3%	5%	8%
Number of New LFUs Per Year (Cost / Benefit)			
	1	2	5
COSTS (£thousands, PV)			
Government	14,820	12,585	9,550
Farmers	355	295	235
Farmers	14,470	12,285	9,315
BENEFITS (£thousands, PV)			
Government	7,445	11,325	16,840
Farmers	4,325	6,550	9,775
Farmers	3,130	4,790	7,060
NET BENEFIT (£thousands, NPV)			
Government	-7,370	-1,240	7,290
Farmers	3,970	6,255	9,545
Farmers	-11,340	-7,495	-2,255

Notes: Constituent parts will not necessarily add up to totals due to rounding. **Worst** – high costs / low benefits. **Best** – low costs / high benefits.

8.2 Purchasing behaviour

The extent to which businesses may switch to buying cattle from within the LRA as opposed to the annually tested area is uncertain; and affects the costs of the policy by changing the number of animals required to test. We have conducted sensitivity checks by adopting a range between 0% - 34% based on the Scottish evidence showing the proportion of imports from the annually tested area fell by about third after the introduction of pre and post-movement testing in Scotland. Some of this may have been for reasons unrelated to the policy and we cannot say with certainty what proportion was attributable to pre and/or post movement testing.

8.3 Level of TB infection pressure

There is uncertainty around future levels of TB and the number infected animals found by post-movement testing. This affects the number of reactors found by post-movement testing and in turn the number of breakdowns prevented in the LRA, affecting therefore both the costs, but mainly the benefits, of the policy. There has been an overall long-term upward trend in the incidence of TB in cattle herds over the last 20 years in Great Britain, but the latest statistics show that the incidence rate is now lower than it was at its peak in 2008⁴⁹. Without detailed modelling of the epidemiology of TB in the LRA this analysis assumes constant rates of disease over the next 10 years. Using

⁴⁹ Defra, [Latest statistics on the incidence of tuberculosis \(TB\) in cattle in Great Britain](#)

Defra statistics we have applied sensitivity around this, set to 2% based on the annual rate of change in the number of reactors slaughtered in the annually test areas between 2008 and 2013.

Cost of post-movement testing

8.4 In the consultation IA the underlying data for vet fees was based on LVI survey data⁵⁰, but we have since received updated data based on fees charged by Veterinary Delivery Partnerships⁵¹ (VDPs) for TB tests paid by government. These prices are lower than the LVI survey rates. Given these prices have been recently competitively tendered they are likely a more accurate reflection of current market prices. However, APHA is a large procurer of veterinary services and so likely to achieve more competitive rates than individual farmers. Issues relating to the cost of government and privately funded tests were raised by the National Farmers Union (NFU) as part of their consultation response⁵². Therefore, the central case assumes that vet fees for post-movement testing is an average of LVI and VDP cost data with the full range reflecting the two sources of prices

8.5 Cost of a breakdown

This affects the benefits of the policy in terms of savings from avoiding or reducing the costs of a breakdown. The estimated cost of a breakdown is derived from a number of sources as set out in **Table 3a** and **Table 3b**. As such, due to the uncertainty around the data which make up the cost of a breakdown, we have conducted a sensitivity check which varies this by +/-10%. The cost of a breakdown also varies by the number of reactors, which we have adopted a range of between 2 and 9, with the central case of 4.5⁵³.

8.6 Neighbouring herd controls under option 1

Under option 1, veterinary advice is that in 80% of cases APHA vets are likely to waive the radial area tests around the infected premises and additional TB testing of neighbouring herds due to the earlier detection of disease through post-movement testing. We conduct sensitivity checks based on this advice, by adopting a range between 60% - 100%, on the central case of 80%.

8.7 Cattle population

The analysis assumes a 0.6% annual decrease in the cattle population⁵⁴. This affects the number of cattle moved and number of herds surveillance tested across the best, worst and central scenarios.

8.8 Compliance and enforcement

Compliance is assumed to be 100% in this analysis consistent with the high levels of compliance seen for pre-movement testing⁵⁵. Any enforcement costs associated with this additional measure are assumed to be negligible and would be part of the existing framework for the TB Order.

8.9 Reducing routine surveillance testing in the LRA

- *Surveillance testing rate:* the central case assumes a rate of 20%, which reflects that while four yearly testing implies 25% of all herds should have routine surveillance testing in any given year, some herds will be tested more frequently due to higher risk or radial testing.
- *Baseline exemption rate and rate of increase:* Across all scenarios, the baseline exemption rate is set at 35% following vet advice and evidence from Scotland. However, the rate of increase is 5% points per annum in the central case, but this varies by +/-2.5% points in the best and worst case respectively.
- *Maximum exemption rate:* the rate is set at 60% across all scenarios, to account for the fact that high risk herds will continue to be tested, and that the policy is not expected to exempt all herds from routine surveillance testing during the appraisal period.

⁵⁰ Defra, [Pre-movement testing review \(2010\)](#), table 14, page 90.

⁵¹ From 1 April 2015 in Wales and 1 May 2015 in England, APHA manage TB testing and other veterinary services in England and Wales through suppliers known as Veterinary Delivery Partnerships (VDPs). More information on VDPs can be found [here](#).

⁵² Defra, [Improving Bovine TB controls: post-movement testing of cattle in England - A summary of responses to the consultation exercise and way forward](#)

⁵³ APHA, [Annual surveillance report for England 2014](#). In the linked report, please see Table 4.3a.

⁵⁴ Agri-Food and Biosciences Institute, [FAPRI-UK 2015 Baseline Projections](#)

⁵⁵ Defra, [Bovine TB Movement Testing Quarterly Report Statistics](#)

- *Introduction date:* The central case assumes, following vet advice, that the policy is introduced in 2019, assuming OTF status is achieved by the same year. Any delay in achieving OTF status also delays introducing the measure, and will therefore reduce the accumulated benefits.

8.10 Licensed Finishing Units (LFUs)

In the baseline we expect the number of LFUs to increase given that five new LFUs were set up each year in 2014 and 2015⁵⁶. However, there is considerable uncertainty regarding the rate of new LFUs in future. Therefore, the central case sets a conservative estimate of 2 new LFUs per year for the rest of the appraisal period (year 2 onwards), with a range of 1 in the worst case and 5 (rate of growth in 2014 and 2015) in the best case. Across all cases, we expect that each new LFU moves around 305 animals to live per year, reducing the number of cattle eligible for post-movement testing by this amount. The figure (305) is the average number of animals moved per holding across all batch sizes, and equates to 169 and 136 animals in small and large batches respectively⁵⁷.

8.11 Appraisal Period

While a 10 year appraisal period is used in the analysis, the sensitivity analysis here assesses the measure over a 20 year period. This is to accommodate for the fact that the measure forms part of the long term goal of eradicating TB, and that that measures introduced are much more likely to yield benefits in the longer term rather than immediately. **Table 12** presents a comparison between using a 10 year and 20 year appraisal period on the the total net present value and EANCB of the measure. As shown, the measure produces a modest net benefit over a 20 year appraisal period. However, the EANCB is virtually unchanged – this is because direct impacts are assessed in this figure, and the ongoing costs of post-movement testing are greater than the benefits of reduced breakdown costs.

Table 12: Net Present Value and EANCB Comparison (*central case*)

	Appraisal Period	
	10 Years	20 Years
Total Net Present Value (£m)	-1.24	0.30
EANCB (£m)	0.97	0.95

Notes: 20 year appraisal period calculations assumes constant costs and benefits from year 11 to year 20, based on costs and benefits in year 10 (see Table 14a).

9. Wider impacts

Economic impacts

Small and Micro Business Assessment

- 9.1 In 2014/15 the average number of employees across all sizes of lowland grazing livestock (cattle farming) was 1.5, and just 5.2 for the largest farms⁵⁸. Therefore, the direct costs annual costs to business of post-movement testing outlined in **Table 10a** (£1.3m) falls entirely on micro-businesses. An exemption for small or micro businesses would undermine the effectiveness of the policy and cannot be granted.
- 9.2 Whilst Small and Micro businesses cannot be exempted as it would compromise the policy, such businesses also benefit from this and other measures that form part of the government's 25 year TB eradication strategy⁵⁹. Reforms in this area tend to yield benefits which materialise in the long-term rather than immediately. For example, the measure:

⁵⁶ Defra, SAM Database

⁵⁷ Defra, RADAR Database. Defra analysis of individual cattle movement data between 2011 and 2013. The figure (305) is the average number of animals moved per holding across all batch sizes, and equates to 169 and 136 animals in **small** and **large batches** respectively.

⁵⁸ Defra, [Farm accounts in England report 2014/15](#). The figures used are the average size of a farm business by "standard labour requirement".

⁵⁹ Defra, [The Strategy for achieving Officially Bovine Tuberculosis Free status for England \(April 2014\)](#)

- helps to achieve a key medium term objective of achieving OTF status in the LRA, which would enable some herds to be exempt from routine surveillance. This produces tangible savings to farmers in the form of reduced productivity loss⁶⁰.
- could encourage farmers in other parts of the country to increase their commitment towards TB controls, in order to serve the ultimate aim of disease eradication.
- reduces disease control costs by detecting TB earlier in and prevent the movement of infected cattle. This is in addition to non-monetised benefits such as reduced stress of operating businesses under restrictions, and increased demand on both domestic and international markets for live cattle⁶¹.

9.3 A way of mitigating these costs of the measure, farms could be encouraged to have Licenced Finishing Units (LFUs)⁶², as cattle moved to LFUs would be exempt from post-movement testing. The introduction of post-movement testing may encourage and/or accelerate the establishment of more Licensed Finishing Units (LFUs), adding to the five new LFUs that were set up each year in 2014 and 2015⁶³.

10. One In, Two Out (OITO)

10.1 This measure is in scope of OITO. It is a regulatory measure for which the monetised benefits to business are less than the monetised costs and therefore takes IN status. We estimate that the measure generates an equivalent annual net cost to business (EANCB) of £0.97m in 2014 prices and 2015 present value.

11. Policy Review Outline

11.1 The objective of the policy is to increase the chance of achieving Officially TB Free (OTF) status for the LRA in the quickest possible time, to encourage more risk-based decision making among cattle keepers, and to protect the current low TB risk status for the area. The measure contributes to the targets for the LRA and the longer term goal of TB eradication in England by 2038, as set out in Defra's TB strategy⁶⁴.

11.2 As shown, the three key outputs are (1) encouraging more risk-based decision making among cattle keepers; (2) reducing disease control costs and; (3) helping achieve OTF status for the Low Risk Area of England in the quickest possible time. Paragraphs 11.3 to 11.6 set out how Defra will assess these outputs in general terms. Overall, Defra already collects much of the data required to review the measure in future. In addition, the planned review date has changed from **September 2019** to **April 2021** since the consultation IA⁶⁵. This is to reflect that following implementation of the measure, we would require 5 years⁶⁶ in order to ensure that we have a full evidence base to enable effective evaluation of the measure.

Encouraging more risk-based decision making among cattle keepers

11.3 While the LRA has low TB incidence, those that occur tend to result from infected cattle that have been brought in from other parts of the UK⁶⁷. The expectation is that introducing post-movement testing will cause some farmers in the LRA to switch the buying location of cattle away from the annually tested-areas, thus reducing the likelihood of TB incidence. Defra already collects detailed cattle movement data⁶⁸, and it is expected that we will continue to do. This will enable us to assess the extent to which LRA farmers switch buying location.

⁶⁰ Please see section 6.29 to 6.34 for further details.

⁶¹ Please see section 6.35 to 6.39 for further details.

⁶² Please see section 5.2 to 5.4 for further details.

⁶³ APHA, SAM Database

⁶⁴ Defra, [The Strategy for achieving Officially Bovine Tuberculosis Free status for England \(April 2014\)](#)

⁶⁵ Defra, [Impact Assessment "Options to increase the chance of achieving Officially TB Free \(OTF\) status for the TB Low Risk Area"](#)

⁶⁶ In line with the [Better Regulation Framework Manual](#), Section 1.7. This stipulates that regulatory measures are usually reviewed within 5 years of coming into force.

⁶⁷ Defra, [The Strategy for achieving Officially Bovine Tuberculosis Free status for England \(April 2014\)](#)

⁶⁸ Defra, RADAR Database

11.4 In addition, we also expect this policy change would encourage more cattle keepers to register their Units as LFUs. Cattle in LFUs are exempt from routine and post-movement TB testing because they are subject to strict bio-security rules, are permanently housed and can only be sent directly to slaughter⁶⁹. Assessing this is straightforward, as we can monitor the number of new LFUs registered by APHA.

Reduce disease control costs and achieve OTF status in the quickest possible time.

- 11.5 The intended effects of the measure are to find disease earlier through testing, and to mitigate the risk of undetected infected cattle being moved into herds in the LRA. This should result in reduced future disease control costs to farmers in the LRA and to government. Defra collects and publishes detailed TB statistics, which includes incidence and prevalence data⁷⁰, as well as financial data on disease control costs. This would allow some assessment of the extent to which post-movement testing reduces breakdowns and associated disease control costs in the LRA. In addition, we can continue to assess whether prevalence rates remain on track to achieve OTF status in the quickest possible time, as defined by EU Council Directive 64/432/EEC.
- 11.6 A caveat to this is that post-movement testing is one of many current and future measures that form the government's TB eradication strategy. Therefore, there would be uncertainty around the relative contribution of post-movement testing and other measures towards this objective which would need to be considered and investigated during the review.

⁶⁹ Please see paragraphs 5.2 to 5.4 for further details.

⁷⁰ Defra, [Bovine TB statistics](#)

ANNEX

Annex 1 – List of Variables, Assumptions and Data Sources

Variable Description	Assumption	Source
CATTLE MOVEMENT AND LICENSED FINISHING UNITS DATA		
Number of moves from annually tested areas of England and Wales to the LRA <i>(Of which)</i>	147,680	
To stay on a farm more than 120 days	126,419	
Small Batches <i>(less than 50 animals)</i>		
Number of farms	3,369	
Total number of animals moved	110,683	APHA , Rapid Analysis and Detection of Animal-Related Risks (RADAR) database. Defra analysis of individual cattle movement data between 2011 and 2013. It should be noted that the 116 farms that move animals in large batches may also do so in small batches.
Average Batch Size	7	
Large Batches <i>(50 animals or more)</i>		
Number of farms	116	
Total number of animals moved	15,736	
Average Batch Size	69	
Average number of animals moved per holding across all batch sizes		
	305	
Average number of animals moved in small batches <i>(less than 50 animals)</i>	169	
Average number of animals moved in large batches <i>(50 animals or more)</i>	136	
Number of Licensed Finishing Units (LFUs)		
	10	
Number of LFUs that move animals from annually tested areas	9	APHA , RADAR Database. Defra analysis of individual cattle movement data between November 2014 and October 2015, based on 2011-2013 average batch sizes and proportion of animals moving from annual-tested areas to live.
Estimated number of animals moved to live in small batches <i>(less than 50 animals)</i>	2,642	
Estimated number of animals moved to live in large batches <i>(50 animals or more)</i>	2,104	
Cattle requiring a post-movement test	84,939 - 121,673	APHA , RADAR Database. Defra analysis applying potential switching range 0% - 34%, based on evidence from Scotland's introduction of pre-and post-movement testing in 2005. The ranges presented here are for year 1 of the appraisal period. It assumes that farms that move animals in large batches do not switch-buying location, and subtracts animals moved by current LFUs as these would be exempted from post-movement testing.
Cattle switched to the LRA <i>(no post-movement test required)</i>	0 - 36,734	Because the analysis assumes that the number of moves falls in line with cattle population forecasts and new LFUs, the number of animals requiring a post-movement test and switching will decrease over the appraisal period.

Variable Description	Assumption	Source
COST OF TESTING DATA		
Vet fees, including:		
Post-Movement Testing (LVI survey and VDP rates)		
Short Interval Testing (skin testing charged at VDP rates, gamma testing funded separately by APHA)		
Administration Costs		
Tuberculin		
Cost of switching buying location		
Farmers' labour productivity loss due to TB testing (per animal, 2016 prices)	£3.34	Defra, Pre-movement testing review 2010
HERD SIZE DATA (LRA)		
Average size of breakdown herd	213	APHA, SAM Database 2013
Average size of neighbouring herd	96	APHA, SAM Database 2014
Average number of animals testing during routine surveillance (per herd)	49	APHA, SAM Database 2013
NON-FINANCIAL BREAKDOWN DATA		
OTFW Breakdowns (LRA, per breakdown)		
Number of reactors	Median = 4.5 (IQR 2 - 9)	
Average number of days under movement restrictions	237	
Average number of short interval tests	3.16	APHA, Annual surveillance report for England 2014 . Defra Analysis of OTFW and OTFS breakdown data in 2014.
OTFS Breakdowns (LRA, per breakdown)		
Number of reactors	Median = 1 (IQR 0 - 1)	IQR = interquartile range.
Average number of days under movement restrictions	127	
Average number of short interval tests	1	
Radial Testing Statistics (LRA)		
Number of OTFW Breakdowns	50	APHA, Radial testing statistics from the LRA in 2013.
Number of radial skin tests	128,613	
Average number of animals radial tested per OTFW breakdown	2,572	Calculations: Average number of animals radial tested: $\frac{128,613}{50} = 2,572$
Number of OTFS breakdowns (detected by radial testing)	19	Probability of detecting an animal reactor: $\frac{19}{128,613} \times 2,572 = 0.380$
Probability of detecting an animal reactor in an OTFS breakdown	0.380	

Variable Description	Assumption	Source
FINANCIAL BREAKDOWN DATA (£, 2016 prices)		
Average gross economic loss <i>(per reactor)</i>	1,774	
Beef	1,526	The University of Reading, Assessment of the economic impacts of TB and alternative control policies (SE3112). Defra analysis of reported unit costs on economic loss, isolation and movement restrictions.
Dairy	2,022	
Isolation costs <i>(per reactor, isolation time is 14.5 days)</i>	1.53	
Movement restrictions cost <i>(per herd, per day)</i>	0.76	
Compensation <i>per reactor)</i>	1,175	APHA, EU co-financing report, SAM Database 2014
Salvage <i>(per reactor)</i>	384	
Net Economic Loss <i>(per reactor)</i>	599	Average gross economic loss minus compensation: $1,774 - 1,175 = 599$
Haulage, slaughter, disposal, post mortem and culture charges <i>(per reactor)</i>	123	APHA, Defra analysis of unit costs in 2012 and 2013.
MISCELLANEOUS		
Probability of detecting TB from post movement testing	0.000262	APHA, Defra analysis of data from SAM Database 2013. The VRA reports that between 2005 and 2011, there were 1,729,444 Pre Movement Tests in England, finding 1,781 reactors and 2,448 inconclusive reactors. Further, Pre-movement testing review 2010 (2010, p.51) argues that 20% of IRs were slaughtered as reactors. This can be used to derive the probability of infection: $\frac{1,781}{1,729,444} + (1,729,444 \times 0.2) = 0.00131$ Given Defra analysis on Scottish post-movement testing, this test is around 5 times less likely to find infection as pre-movement testing; the probability of infection being: $\frac{0.00131}{5} = 0.000262$
Batch factor	0.93	Defra, Pre-movement testing review 2010.
Probability of a controlled hotspot	0.02	
Number of herds in controlled hotspot	4	Batch factor accounts for the fact that two animals may end up at one farm, resulting in over counting the number of new incidents of TB.
Probability of an uncontrolled hotspot	0.0001	
Number of herds in uncontrolled hotspot	100	
Average annual rate of change in number of confirmed reactors from HRA & Edge slaughtered as a result of TB	-2.2%	Defra, Latest statistics on the incidence of tuberculosis (TB) in cattle in Great Britain. Defra analysis of TB incidence data for annually-tested counties between 2008 and 13.

Variable Description	Assumption	Source
Average annual rate of change in the cattle population	-0.6%	Agri-Food and Biosciences Institute, FAPRI-UK 2015 Baseline Projections April 2015 . Defra analysis of forecasted changes in the total cattle population between 2010 and 2024.
GDP Deflator	Used to inflate various unit costs to 2016 prices	ONS, GDP deflators at market prices, and money GDP
Agricultural price indices	Used to inflate gross economic loss values from the 2004 University of Reading study to 2014 prices, the latest data available.	Defra, Agricultural price indices

Annex 2 – Counties by Risk Area

List of Counties in the Low Risk Area (LRA)

Bedfordshire, Cambridgeshire, Cumbria, Essex, Greater Manchester, Hertfordshire, Humberside, Isle Of Wight, Isles of Scilly, Kent, Lancashire, Lincolnshire, Merseyside, Norfolk, Northumberland, North Yorkshire, South Yorkshire, Suffolk, Surrey, West Sussex, West Yorkshire.

List of Counties in the Annually Tested Area

Avon, Berkshire, Buckinghamshire, Cheshire*, Cornwall, Derbyshire, Devon, Dorset, East Sussex, Gloucestershire, Hampshire, Hereford & Worcester, Leicestershire, Northamptonshire, Nottinghamshire, Oxfordshire, Shropshire, Somerset, Staffordshire, Warwickshire, West Midlands, Wiltshire.

*As of January 1st 2015, part of Cheshire (the northern two-thirds, corresponding to the Edge Area section of the country) is on a 6 monthly testing regime.

Annex 3 - Potential Advantages of OTF Status

Avoiding additional costs of disease

A3.1 Achieving OTF status may strengthen the resolve of farmers in the LRA to adopt risk-based trading practices to keep TB out, thereby avoiding the additional costs of increased levels of TB in the LRA.

Demonstrating progress on eradication

A3.2 Although there is no specific legal requirement for Member States to achieve OTF status, the EU's objective is to 'eradicate' TB, which equates to all Member States achieving a disease status which would be eligible for OTF status.

A3.3 Scotland achieved OTF status as a UK region in 2009⁷¹. England can be divided into three distinct risk areas – high, edge of high and low. The proposed TB Eradication Strategy for England envisages stepwise achievement of OTF status, starting with counties in the LRA.

A3.4 As outlined in DG-SANCO Commissioner Borg's letter of 14 January 2013, the Commission has allocated considerable funds to co-finance the UK TB programmes since 2010 and expects significant improvements in the disease situation. This will be particularly important in securing ongoing EU co-financing. Achieving OTF status for the LRA would provide further evidence of UK progress on, and commitment to, eradicating the disease.

Reducing routine herd surveillance testing

A3.5 In an OTF Member State or region, routine herd surveillance testing of herds may be reduced or stopped. **Table 13** compares routine herd surveillance testing in Scotland and the LRA. Scotland's approach currently exempts around 45% of cattle herds from routine four yearly herd testing⁷².

Table 13: Routine herd surveillance testing in Scotland and the LRA

	Scotland	LRA of England
Routine Herd Testing ¹	Four yearly with exemption for 'low risk' herds that comply with one of the following criteria: - herds with fewer than 20 cattle which have had fewer than 2 consignments of cattle moved on from high incidence TB areas (including Northern Ireland and the Republic of Ireland) in the previous 4 years. - herds that slaughter more than 25% of their stock annually and have had fewer than 2 consignments of cattle moved on from high incidence TB areas (including Northern Ireland and the Republic of Ireland) in the previous 4 years. - herds that slaughter more than 40% of their stock annually.	Four yearly in a majority of herds ²

Notes: Please see footnote 72 for further information on the routine surveillance testing regime in Scotland. ¹ Routine Herd Testing involves testing of breeding animals over two years old.

² Individual herds in the LRA deemed 'high risk' or in the vicinity (3km radius) of an OTFW incident are subject to annual Whole Herd Testing.

⁷¹ [Commission Decision 2009/761/EC](#) declaring that Scotland is Officially Free of Bovine TB

⁷² Scottish Government, [Bovine Tuberculosis - TB testing and surveillance](#). Glasgow University also conducted a modelling study that underpinned the current risk-based surveillance policy in Scotland ([link](#)).

Promoting international trade

A3.6 International trade in live cattle has been relatively low in the wake of the lifting of the BSE-related export ban in 2006. For example, between 1 July 2007 and 30 June 2008, a total of 66,764 cattle were exported from Great Britain. Exports to the Netherlands accounted for 35% of all exports and exports to Belgium (27%), France (23%) and Spain (7%) made up the bulk of the remainder. No cattle were exported to countries outside the European Union. In July 2008, Dutch and Belgian farmers decided to boycott UK cattle following the detection of TB in a consignment of veal calves (under 42 days old) exported from GB to the Netherlands.

A3.7 Although OTF herd status provides the primary basis for trade, achievement of OTF status for the LRA would provide EU recognition of its status and increase the confidence of potential cattle importers in other Member States, especially those which are already OTF, and in third countries. Fifteen Member States are OTF – Belgium, Czech Republic, Denmark, Germany, Estonia, France, Latvia, Luxembourg, Netherlands, Austria, Poland, Slovenia, Slovakia, Finland and Sweden. In addition to Scotland, 12 regions of Italy and 1 region of Portugal are OTF.

Reducing pre-export testing for intra-EU trade

A3.8 Cattle over 42 days old exported to other Member States for breeding or production do not require a negative pre-movement test (PrMT) in the last 30 days if they come from an OTF Member State or region. Scotland has not yet taken advantage of this derogation.

Conclusion

A3.9 Achieving OTF status for counties within the LRA would provide formal recognition of its risk status and reinforce the objective of keeping disease out. Potential advantages include strengthening resolve to keep disease out thereby avoiding additional disease costs, demonstrating progress on eradication, the opportunity for a risk-based reduction in the burden of routine herd surveillance testing, and promotion of international trade.

Annex 4 – Cost benefit analysis over the appraisal by scenario

Table 14a: Cost benefit analysis over the appraisal period (central case, £thousands, unrounded)

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Total PV	Average Annual
Total Cost	1,524	1,509	1,494	1,479	1,465	1,450	1,436	1,421	1,407	1,393	12,583	1,458
Government	36	36	35	35	34	34	34	33	33	33	296	34
Farmers	1,488	1,473	1,459	1,444	1,430	1,416	1,402	1,388	1,374	1,360	12,286	1,423
Total Benefit	919	912	905	1,367	1,426	1,484	1,542	1,598	1,655	1,645	11,344	1,345
Government	571	566	561	786	814	841	869	896	923	918	6,552	774
Farmers	348	346	344	582	612	643	673	702	732	728	4,792	571
Net Benefit	-605	-597	-589	-112	-39	34	106	177	248	253	-1,238	-112
Government	535	530	525	751	779	807	835	863	890	885	6,256	740
Farmers	-1,139	-1,127	-1,114	-863	-818	-773	-729	-685	-642	-632	-7,494	-852

Table 14b: Cost benefit analysis over the appraisal period (worst case - high cost / low benefit, £thousands, unrounded)

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Total PV	Average Annual
Total Cost	1,778	1,765	1,751	1,738	1,724	1,711	1,698	1,685	1,672	1,659	14,822	1,718
Government	42	42	42	41	41	41	40	40	40	39	353	41
Farmers	1,736	1,723	1,709	1,696	1,683	1,670	1,658	1,645	1,632	1,620	14,468	1,677
Total Benefit	555	543	530	983	999	1,016	1,032	1,049	1,065	1,082	7,452	885
Government	358	351	344	562	568	574	580	586	592	598	4,323	511
Farmers	197	192	186	420	431	442	452	463	473	484	3,129	374
Net Benefit	-1,223	-1,222	-1,221	-755	-725	-696	-666	-636	-607	-577	-7,369	-833
Government	316	309	302	521	527	533	539	546	552	558	3,970	470
Farmers	-1,539	-1,531	-1,523	-1,276	-1,252	-1,229	-1,205	-1,182	-1,159	-1,136	-11,339	-1,303

Table 14c: Cost benefit analysis over appraisal period (best case - low cost / high benefit , £thousands, unrounded)

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Total PV	Average Annual
Total Cost	1,263	1,198	1,136	1,117	1,098	1,079	1,060	1,042	1,023	1,005	9,550	1,102
Government	30	29	28	28	27	27	26	26	25	24	234	27
Farmers	1,234	1,169	1,108	1,089	1,071	1,052	1,034	1,016	998	980	9,316	1,075
Total Benefit	1,417	1,433	1,450	1,942	2,063	2,184	2,304	2,358	2,379	2,402	16,839	1,993
Government	866	873	881	1,124	1,186	1,248	1,309	1,339	1,353	1,367	9,777	1,155
Farmers	551	560	569	818	877	936	994	1,019	1,027	1,035	7,062	839
Net Benefit	153	235	314	824	965	1,104	1,243	1,316	1,356	1,397	7,289	891
Government	836	844	853	1,096	1,159	1,221	1,283	1,313	1,328	1,342	9,544	1,128
Farmers	-683	-609	-538	-271	-194	-117	-40	3	29	55	-2,255	-237