

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: DEFRA Other departments or agencies:	Impact Assessment (IA)	
	Date: 18/12/2014	
	Stage: Consultation IA	
	Source of intervention: Domestic	
	Type of measure: Secondary legislation	
Summary: Intervention and Options	Contact for enquiries: comms.tb@DEFRA.GSI.GOV.UK	
	RPC Opinion: RPC Opinion Status	

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, Measure qualifies as Two-Out?
£-5.0million	£-10.2million	£0.9million	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 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 2018.

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 TB Low Risk Area (in the quickest possible time) and encourage more risk-based decision making among cattle keepers.

The intended effects are to:

- Find disease earlier through testing, reducing disease control costs to farm businesses (both buyer and seller), and the taxpayer;
- Prevent onward spread, or infected cattle being moved into the Low Risk Area, avoiding future disease control costs to farmers in the LRA and taxpayer. This will avoid disease control costs to both farm businesses and taxpayers.

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 (ATA) of England and Wales to the LRA which are not slaughtered within 120 days. This is the preferred option.
2. Introduce annual testing for all herds in the LRA.

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: 09/2019

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	< 20		Small	Medium	Large
	Yes	Yes		Yes	Yes	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, given the available evidence, it represents a reasonable view of the likely costs, benefits and impact of the leading options.

Signed by the responsible SELECT SIGNATORY: _____ Date: _____

Summary: Analysis & Evidence

Policy Option 1

Description: Introduce tests for all cattle moved from Annually Tested Areas (ATA) of England and Wales to the Low Risk Area which are not slaughtered within 120 days.

FULL ECONOMIC ASSESSMENT

Price Base Year 2014	PV Base Year 2014	Time Period Years 10	Net Benefit (Present Value (PV)) (£m)		
			Low: £-6.6m	High: £-2.6m	Best Estimate: £-5.0m

COSTS (£m)	Total Transition (Constant Price) Years		Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low	N/A	0	£1.5m	£12.7m
High	N/A		£1.8m	£15.5m
Best Estimate	N/A		£1.6m	£14.2m

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

Costs to businesses include vet fees (£1.1m per year), labour costs and any impact on farm productivity (£0.4m per year), and cost of switching buying location of cattle (£0.1m per year). Total £1.6m per year. Costs to government include the cost of providing Tuberculin (Total £36k per year). Together these figures give the total cost shown above in the central annual estimate of £1.6m per year. (see Table 3)

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

There may be a cost to some farmers in the annually-tested areas from trade in cattle movements foregone to the LRA. This cost is considered to be negligible as Defra analysis of cattle movements data suggests this would affect less than less than 1% of total cattle movements of the ATA, and is therefore not monetised in the assessment

BENEFITS (£m)	Total Transition (Constant Price) Years		Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)
Low	N/A	0	£0.7m	£6.1m
High	N/A		£1.5m	£12.9m
Best Estimate	N/A		£1.1m	£9.2m

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

Benefits to businesses of finding disease earlier through testing or preventing diseased cattle moving into the LRA saves on additional disease control costs (£0.4m per year to business in avoided economic loss and £0.5m per year to government avoiding compensation payments and slaughter). There are also the benefits of reduced risk of disease spilling over into neighbouring farms (£52k to business and £108k to Government in avoided control costs – compensation, admin, and vet fees for testing). Total benefits are £1.1m per year.

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

Benefits to farmers, families and local communities from reduced stress of operating businesses under restrictions as well as the emotional impact of losing valued cattle. Benefit to cattle keepers and government through increased potential of the LRA to trade within the EU and internationally, especially live cattle, providing options for reducing surveillance and so disease control costs (see section 8.1-8.4). Benefit to some farmers in the LRA who gain from the increased domestic demand for cattle from within the area as a result of animal movements being switched away from the ATA.

Key assumptions/sensitivities/risks

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 (see section 10 Risks & Uncertainties for full details and table 11 for list of sources and assumptions).

BUSINESS ASSESSMENT (Option 1)

Direct impact on business (Equivalent Annual) £m:			In scope of OITO?	Measure qualifies as
Costs: 1.3	Benefits: 0.3	Net: -0.9	Yes	IN

Summary: Analysis & Evidence

Policy Option 2

Description: Introduce annual testing for all herds in the Low Risk Area.

FULL ECONOMIC ASSESSMENT

Price Base Year 2014	PV Base Year 2014	Time Period Years 10	Net Benefit (Present Value (PV)) (£m)			
			Low: -	High: -	Best Estimate: -	
COSTS (£m)		Total Transition (Constant Price) Years		Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)	
Low		N/A		-	-	
High		N/A		-	-	
Best Estimate		N/A		£19.8m	£170.4m	
Description and scale of key monetised costs by ‘main affected groups’ Costs of annual testing to businesses include labour costs and any impact on farm productivity (£7m per year). Costs of annual testing to government include vet fees and cost of providing Tuberculin (£12.8m per year). Together these costs total £19.8m per year in the central case (see section 5.17).						
Other key non-monetised costs by ‘main affected groups’ Cost to farmer (vet fee + labour cost, and productivity loss) and to government (for Tuberculin) of having to have a clear pre-movement test for cattle moved from LRA herds (see 5.21).						
BENEFITS (£m)		Total Transition (Constant Price) Years		Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)	
Low		N/A		-	-	
High		N/A		-	-	
Best Estimate		N/A		-	-	
Description and scale of key monetised benefits by ‘main affected groups’ The benefit of annual testing could be similar but unlikely materially greater than that under option 1 (around £1.1m per year). This is because increased surveillance testing is likely to speed up the detection of new cases of TB – reducing costs of TB breakdowns – but is unlikely to avoid the costs of new cases of TB breakdowns arising from reactors prevented from moving into the LRA under option 1 (see 6.1).						
Other key non-monetised benefits by ‘main affected groups’ Increased surveillance testing in cattle herds in the LRA will speed up the detection of new cases of TB. Where disease is found earlier there will be reduced costs of TB breakdowns: Savings to farmers in economic losses, testing costs, swifter lifting of movement restrictions. Savings to government of testing costs, compensation and administration.						
Key assumptions/sensitivities/risks					Discount rate	3.5%
N/A						

BUSINESS ASSESSMENT (Option 2)

Direct impact on business (Equivalent Annual) £m:			In scope of OITO?	Measure qualifies as
Costs: -	Benefits: -	Net: -	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 will cost nearly £100 million for Defra with costs to farmers estimated to run to around £75 million a year. In 2013, almost 6.2 million cattle in England were tested for TB resulting in 3,900 new herd TB incidents, 5,200 herds put under restriction and the slaughter of 26,600 animals¹.
- 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 Programme.³ 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 2018.
- 1.3 Official TB free status for the LRA will provide tangible benefits for the cattle industry, rural communities, wider society and government. These benefits include options to reduce costs for government and industry, and increased ability to trade within the EU and internationally⁴.
- 1.4 The LRA consists of counties⁵ with very low TB incidence rates – herds in this area are routinely tested for TB every four years. Since 2006 cattle moved from herds under annual surveillance testing must have had a clear TB test within the 6 weeks preceding move. However, around 40 new TB incidents are detected in the LRA on average per year (2011-13).⁶ These incidents, officially known as ‘breakdowns’, are estimated to cost in total in the region of £2.4 million per year⁷, and result in OTF status being withdrawn at the herd level (OTFW).⁸ In almost 50% of these breakdowns there was strong scientific evidence – from detailed veterinary analyses, reviews of cattle movements into the herds, and genotyping of the strain of TB disclosed – indicating the source of infection was caused by movements of undetected diseased cattle from annually-tested herds in the higher TB incidence areas of England and Wales, which had not been found by annual and pre-movement testing.⁹ The origin of the remaining breakdowns was obscure or could not clearly be ascribed to inward cattle movements and therefore deemed ‘indigenous’, but there is no evidence of TB infected wildlife being the problem for these breakdowns.¹⁰
- 1.5 Analysis by the Animal and Plant Health Agency (APHA, 2014) demonstrated that if only those TB breakdowns which were found to be indigenous to the LRA are considered then the annual rate of OTF withdrawn status in the LRA remained below or equal to 0.1 percent throughout the 6 year period (up to 2012), with the proportion of OTF disease free herds remaining above 99.9 percent.¹¹ This demonstrates that the LRA region has great potential to gain disease free status by the European Union Council which requires the percentage of OTFW herds must not have exceeded 0.1 percent per annum of all herds for 6 consecutive years, with at least 99.9 percent of herds having achieved OTF status each year for 6 consecutive years.¹² Breakdowns originating from the Annually Tested Area ATA 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 internationally.

¹ Defra, Bovine TB statistics: <https://www.gov.uk/government/statistics/incidence-of-tuberculosis-tb-in-cattle-in-great-britain>

² Defra (April, 2014), The Strategy for achieving Officially Bovine Tuberculosis Free status for England.

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300447/pb14088-bovine-tb-strategy-140328.pdf

³ http://ec.europa.eu/food/animal/diseases/docs/adopted_2013_722_eu_bovine_tuberculosis_uk_en.pdf

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. <http://www.oie.int/>

⁵ Bedfordshire, Bristol, Cambridgeshire, Durham, Cumbria, East Yorkshire, Essex, Greater London, Greater Manchester, Hertford, Isle of Wight, Isles of Scilly, Kent, Lancashire, Lincolnshire, Merseyside, Norfolk, North Yorkshire, Northumberland, Rutland, South Yorkshire, Suffolk, Surrey, Tyne & Wear, West Sussex and West Yorkshire.

⁶ Animal and Plant Health Agency APHA (2014), Bovine TB annual surveillance report: <https://www.gov.uk/government/statistics/bovine-tb-surveillance-in-great-britain>

⁷ Average cost of a confirmed new incident (breakdown) in the LRA is around £59k, times 40 equals £2.4million (see table 4 and 10 for sources).

⁸ This refers to OTFW confirmed cases which are the focus of this analysis. In total there are about 100 new incidents declared each year in the LRA, the remaining incidents are unconfirmed cases which also represent a cost to farmers and government.

⁹ APHA (2014): Bovine TB annual surveillance report. <https://www.gov.uk/government/statistics/bovine-tb-surveillance-in-great-britain>

¹⁰ The origin of the remaining breakdowns was likely due to limitations of data rather than being caused by local infection (APHA, 2014).

¹¹ APHA (2014).

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/300447/pb14088-bovine-tb-strategy-140328.pdf

¹² EU Council Directive 64/432/EEC. <http://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX:31964L0432>

- 1.6 To achieve this goal the policy proposal therefore focuses on reducing breakdowns in the LRA by speeding up detection of TB through increased surveillance in cattle – as breakdowns can be traced back to diseased animals coming from the annually-tested area then it is important to tackle this source of infection.
- 1.7 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 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 Intended effects are to find disease earlier through testing and prevent onward spread. 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).

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. Testing 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. There would be no change to farmer compensation arrangements by government for any cattle slaughtered under post-movement testing. This option applies the same rules as those that already operate in Scotland, which has benefited from OTF status as a UK region since 2009.¹³ This is the preferred option.

3.2 Option 2 – Place all herds in the Low Risk Area on annual surveillance testing

This option would require all herds in the LRA to have their TB surveillance testing increased from once every four years to once every year. It would also mean that cattle moved from LRA herds would need a clear pre-movement test, paid for by the farmer. This would be in addition to the current policy of putting higher TB risk herds in the LRA on annual testing which officials are working to enhance.

- 3.3 In a recently completed consultation (11 June to 11 July 2014), Defra included a call for views on the proposal for post-movement testing of cattle. Most of those who responded to our call for views agreed that post-movement testing should be introduced in the LRA.¹⁴ More generally we have seen an increased demand among cattle keepers for enhanced cattle controls (including post-movement testing) in the LRA – this became particularly noticeable after the two recent TB outbreaks in Cumbria.
- 3.4 Veterinary advisers, the British Veterinary Association (BVA) and British Cattle Veterinary Association (BCVA) are also supportive. They believe that compulsory post-movement testing of cattle would be a proportionate way of improving the probability of detecting diseased cattle moved from annually-tested herds.
- 3.5 Previous experience with a non-regulatory approach to pre-movement testing, which is similar to post-movement testing, suggests that farmers are unlikely to voluntarily test cattle. Before 2006, owners of herds in the annually-tested areas were urged to pre-movement test their stock – but farmers very rarely

¹¹ EU Commission Decision 2009/761/EC declaring that Scotland is Officially Free of Bovine TB.

¹⁴ i.e. 63% supported the proposal; 16% offered no comment; and 21% did not support it.

did so. This suggests that an approach which encourages voluntary testing is unlikely to achieve the policy objectives.

- 3.6 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. Scotland was declared OTF in 2009, post-movement testing was one of their key policies not least because it provided assurance to the EC that controls were in place to protect the OTF status.

4. Application and scope

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

5. Costs

Option 1 – Post-movement testing

- 5.1 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. The costs of testing include vet fees, farmer time for gathering and presenting animals and any impact on productivity. These are estimated on a per cattle basis using estimates from the Pre-movement test Review (Pre-MT Review, 2010),¹⁵ in 2014 prices.
- 5.2 Government would pay £0.3 per animal for the supply of Tuberculin used in the testing of cattle.
- 5.3 Defra statistics show that around 148 thousand animals moved annually on average to the Low Risk Area from the annually tested areas of England and Wales 2011-2013. Of these, an estimated 126 thousand stayed on farms for longer than 120 days and so would be in scope of this policy (RADAR dataset, 2011-2013 average).¹⁶ Due to uncertainty about the future number of animal moves, the central case assumes this level remains constant going forward. Contraction of the industry could mean they fall with the Agri-Food and Biosciences Institute (AFBI, 2012) suggesting a contraction of 5% over the next 10 years (See 10.5).¹⁷

Businesses receiving small volumes of cattle

- 5.4 Analysis of the cattle movement data finds that some 110 thousand of the 126 thousand cattle moved per year, moved in average batches of 7 animals. Based on findings from the published review of Defra' pre-movement testing policy, testing costs for batches of 7 animals is £11.40 per animal, as well as the £3.34 for farmer time and productivity loss. Therefore, total testing cost is estimated at £15 per animal.
- 5.5 It is likely that introducing this measure would lead to some change in behaviour as farmers become more aware of the risks of moving cattle into the LRA and switch their buying location to avoid paying the costs of testing.
- 5.6 Scotland introduced pre and post movement testing in 2005. Before its introduction around half of cattle imported from England came from low risk areas of England with the other half coming from annually-tested areas. After the policy came in the proportion of moves from annually-tested areas fell to a third. Proportionately, this is a decrease of around 34%. Some of this change may have been for reasons unrelated to the policy and we cannot say with certainty what proportion of this change was attributable to pre and/or post movement testing. Yet, given that Scotland introduced both pre and post movement testing together, then the 34% figure likely reflects more of an upper bound of the impact of introducing post movement testing alone on where buyers source their cattle.
- 5.7 We use a range of 0-34% to conduct sensitivity analysis over the potential change in behaviour in response to this policy, taking the midpoint of 17% in the central case.
- 5.8 Table 1 shows the range around the number of animals which are still moved and those which are switched from the annually-tested areas to businesses receiving small volumes of cattle in the LRA:

¹⁵ <http://archive.defra.gov.uk/foodfarm/farmanimal/diseases/atoz/tb/documents/pre-movement-testing-review.pdf>

¹⁶ Defra analysis of individual cattle movements data (APHA) 2013.

¹⁷ Agri-Food and Biosciences Institute (AFBI): 2012 - FAPRI-UK Baseline Projections 2012-2021: <http://www.afbini.gov.uk/fapri-uk-project>

Table 1 – Number of animals moved and those which are switched to the lower risk area

	Number of animals		
	Low	Central	High
Bought from ATA	110k	92k	73k
Bought from LRA	0k	19k	38k

In the central case:

- 92 thousand animal moves continue to be bought from the annually-tested areas and therefore incur the costs of testing cattle.
- 19 thousand animals are no longer bought from the annually tested areas and are instead sourced from the within the LRA. These therefore do not incur the costs of testing cattle.

- 5.9 Those farmers in the LRA that switch buying location are likely to incur some cost such as time spent searching for replacements, or if 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. Some farmers which switch may incur no additional costs. 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 £15 cost of testing cattle.¹⁸
- 5.10 Taking the number of animals moved or switched from the annually-tested area in table 1 and multiplying by the cost per animal (see 5.4) gives the total costs to government and businesses receiving small volumes of cattle (table 2)

Table 2 – Costs per year to government and businesses receiving small volumes

Costs	Farmer	Government
Not switched (Post-movement test required)	£1.4m	£31k
Switched (No post-movement test required)	£0.1m	£0k
Total	£1.5m	£31k

Summing the costs to government (£31,000) and farm businesses receiving smaller cattle volumes (£1.5m) gives a total cost of £1.5m per year.

Businesses receiving large volumes of cattle

- 5.11 This leaves some 16 thousand of the animals moved that were moved in batches of 50 animals or more to around 116 businesses. As economies of scale create lower test costs per animal for these larger batches then these businesses may be less likely to switch buying location and incur the cost of time spent searching for replacing larger quantities of animals, which may be more expensive than previously. Therefore, for these 116 businesses we only consider the cost of testing. Based on the Pre-MT Review, testing costs for batches of 50 or more animals is £4.55 per animal, plus £3.34 for farmer time and productivity loss. Total cost for these 16 thousand moves is therefore £126,000.
- 5.12 Government would pay £5,000 for the supply of Tuberculin used to test these 16 thousand animals.
- 5.13 Summing the costs to government (£5,000) and farm businesses receiving larger cattle volumes (£126,000) gives a total cost of £131,000 per year.

Total costs

- 5.14 Table 3 summarises the total cost of post-movement testing at £1.6m per year (£36k to government and £1.6m to business, with an average annual cost to business of approximately £500).¹⁹

¹⁸ Even in the extreme of assuming this switching cost doubles (i.e. is equal to £15 testing cost), this would not materially change the expected overall net impact of the policy as the switching cost makes-up a very small fraction of overall cost.

¹⁹ Total cost of £1.6m per year divided between some 3.5 thousand businesses in the ATA, gives an average annual cost to business of £463.

Table 3 – Total yearly costs (central estimate summary)

	By Volume of cattle moved	Cost item	(No. of cattle) x (Cost per animal)	Cost	Total cost
Farmer	Small	Vet Fee	92k x £11.40	£1.0m	£1.1m
	Large	Vet Fee	16k x £4.55	£73k	
	Small	Labour & productivity	92k x £3.34	£0.3m	£0.4m
	Large	Labour & productivity	16k x £3.34	£53k	
	Small	Switching buying location	19k x £7.50	£0.1m	£0.1m
	Large	Switching buying location	0 x £7.50	£0	
Govt.	Small	Tuberculin	92k x £0.3	£31k	£36k
	Large	Tuberculin	16k x £0.3	£5k	
Total					£1.6m

Unquantified costs

- 5.15 There may be some familiarisation costs to businesses; these 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 less than 1% of the total cattle moved from herds in the annually tested areas each year.²⁰

Option 2 –Place all herds in the Low Risk Area on annual surveillance testing

- 5.17 This option would require all herds in the LRA to have their TB surveillance testing increased from once every four years to once every year (in 2014 prices). In addition to this, cattle moved from LRA herds would need a clear pre-movement test, paid for by the farmer.
- 5.18 The cost of placing all herds in the LRA on annual testing is estimated by multiplying the number of additional herd tests by the cost of testing. Based on the Pre-MT Review, the cost of a routine surveillance test to a farmer is estimated at £3.34 per animal, which includes cost of farmers time gathering and presenting animals for testing and impact on productivity. According to Defra statistics the average herd size in the LRA is 213 cattle with around half of the animals being routinely tested in 2013. Therefore the average cost to a farmer of a routine whole herd test is £355 (£3.34 x 107 animals tested).
- 5.19 Based on Defra statistics it is estimated that an additional 19,600 surveillance tests would be required per year under option 2. Therefore the total cost to farmers of these additional tests would be £7million per year, with the additional cost to government estimated at £12.8million per year.²¹
- 5.20 Summing the costs to farmers (£7m) and to government (£12.8m) gives a total cost of placing all herds in the LRA on annual surveillance testing at £19.8m per year.
- 5.21 Based on the cost of annual surveillance testing alone, option 2 is considered a disproportionate approach to achieving the policy objective. The monetised benefits are unlikely to be as great as under option 1 and so are not monetised in this assessment.

6. Benefits

²⁰ Defra analysis of individual cattle movements data (APHA) 2013. The estimated 19 thousand cattle switched (i.e. no longer bought) from the ATA in table 1 would represent less than 1 per cent of the total 3.5million cattle moves of the area.

²¹ PQ 0261, response [204013], 08/07/14: <http://www.publications.parliament.uk/pa/cm201415/cmhansrd/cm140708/text/140708w0001.htm>

Option 1 – Post-movement testing

- 6.1 The benefit of this policy will be to prevent disease spread within and between cattle herds and avoid the associated 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 animal 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 ATA
 - Reduced risk of spread of TB into neighbouring herds within the LRA
- 6.2 Where post-movement testing discloses an animal reactor, this may require further testing and restrictions on the originating farm in the ATA. 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 low risk area.
- 6.3 In order to establish the benefits to businesses and government, the following needs to be estimated:
1. Number of reactors found earlier by post-movement testing;
 2. Number of reactors prevented from moving into the LRA which would have resulted in breakdowns;
 3. Costs of a breakdown under business as usual and under post-movement testing;

Number of reactors found or prevented from moving in the LRA

- 6.4 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, but the latest statistics show that incidence rate has been levelling off since around 2008.²² Without any robust evidence on future levels of TB, therefore, this analysis assumes constant rates of disease over the next 10 years. Using 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.
- 6.5 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 analysis.²³
- 6.6 A batch factor of 0.93 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.
- 6.7 Multiplying the numbers of cattle moved or switched from the ATA (table 1) 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.
- 6.8 Of the 108 thousand animals moved from the ATA, the expected number of breakdowns occurring as a result of reactors found by post-movement testing in the LRA is 26.²⁴

²² Defra: <https://www.gov.uk/government/collections/bovine-tb>

²³ The VRA reports that between 2005 and 2011, there were 1,729,444 PrMTs in England, finding 1,781 reactors and 2,448 inconclusive reactors. Further, PrMT review Phase 1 (2010, p.51) argues that 20% of IRs were slaughtered as reactors. This can be used to derive the probability of infection at 0.00131 ($[1,781/1,729,444 + (1,729,444 \times 0.2) = 0.00131]$). Given Defra stats analysis for Scottish post-movement testing, this test is around 5 times less likely to find infection as pre-movement testing; the probability of infection being 0.00026 (0.00131/5).

²⁴ These 108 thousand cattle are from the 16 thousand moved from to businesses receiving large volumes of cattle (batches of 50 or more animals) in the LRA, and the remaining 92 thousand moved onto farms receiving smaller volumes of cattle in the LRA.

- 6.9 This leaves some 19 thousand animals switched from the ATA, which is expected to avoid 5 breakdowns which would have otherwise occurred in the LRA.

Costs of a breakdown

- 6.10 When a cattle herd is found to have TB it loses its Officially TB Free status and undergoes a series of disease control measures until disease-free status is regained. This is known as a 'TB breakdown'. 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 and slaughter 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.
- 6.11 In addition to the costs of control measures on the breakdown farm, there are the costs of additional tests of all neighbouring herds within a 3km radius, the slaughter of any cattle that react to the test, and movement restrictions and repeated testing and slaughter until the rest of the herd is cleared.
- 6.12 Government pays the cost of compensation payments net of any salvage received, as well as haulage, disposal and slaughter costs. These are valued at £881 per animal, on average, taken from APHA accounts data for 2012/13.²⁵ There is also the cost of short interval and gamma tests on the rest of the breakdown herd (£22,000), plus the costs of controls on neighbouring herds (£14,000). Therefore the total cost to government is approximately £39,000 per breakdown under business as usual (i.e. in the absence of post-movement testing).
- 6.13 The main cost to farmers is due to the loss of cattle and having to present their animals for repeated testing. Based on work carried out by Reading University²⁶ it is estimated that each cattle slaughtered due to TB, costs a farmer on average £900 in production losses and replacement costs after taxpayer compensation is received. Therefore the cost to farmers of slaughter is around £3,000 for 3 slaughtered animals in the LRA per breakdown. There are also the costs of additional gathering and testing of animals (£15,000) as well as movement restrictions and isolation (£1,000). Total cost to farmers is therefore around £20,000 per breakdown under business as usual.
- 6.14 As post-movement testing has found animal reactors earlier than would otherwise be the case, then there is a reduced risk of onward spread and thereby the size and cost of a breakdown is lessened. 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.²⁷ This means that in the other 20% of breakdowns the costs of controls on neighbouring herds must be taken into account under option 1. The cost of a breakdown brought about by post-movement testing is £34,000 per breakdown (£8,000 to the farmer and £26,000 to government).
- 6.15 For those breakdowns occurring earlier, the benefit to businesses and government will be the saving from the difference in cost of a breakdown under business as usual (table 4) and the cost of a breakdown under post-movement testing (table 5). This equals £25,000 per breakdown (£12,000 to business, and £13,000 to government).
- 6.16 Applying this benefit to the expected 26 breakdowns occurring as a result of reactors found by post-movement testing (see 6.8) gives a total benefit of £0.65m per year (£0.31m to business and £0.34 to government).
- 6.17 For the expected 5 breakdowns avoided in the LRA from cattle switched (see 6.9), these avoid the £59,000 cost of a breakdown under business as usual. This therefore gives an estimated benefit of £0.3m per year (£0.1m to business and £0.2m to government) from avoiding new TB incidents/breakdowns in the LRA.
- 6.18 Table 4 shows the average cost of a breakdown in the LRA under business as usual, which is estimated to be approximately £59,000, split between costs to farmers of £20,000 and £39,000 to government (see table 11 for sources).²⁸

²⁵ APHA SAM compensation data 2012/13

²⁶ Defra Project SE3112, Reading University 2004 *Assessment of the economic impacts of TB and alternative control policies*
www2.defra.gov.uk/research/Project_Data/More.asp?l=SE3112&M=KWS&V=se3112&SUBMIT1=Search&SCOPE=0

²⁷ We conduct sensitivity checks based on this advice, by adopting a range between 60% - 100%, on the central case of 80%.

²⁸ Cost of a breakdown is estimated using a number of sources as listed in Table 10 – Summary table of assumptions.

- 6.19 Table 5 shows the average cost of a breakdown in the LRA under option 1, which is estimated to be approximately £34,000, split between costs to farmers of £8,000 and £26,000 to government (see table 11 for sources).

Table 4 – Average cost of a confirmed new incident (breakdown) of bovine TB in cattle in the LRA, under business as usual (see table 11 for sources).

	Cost	Average units	Government	Farmer	Total
Breakdown farm	Slaughter (incl. haulage, vet fee, compensation)	3 animal reactors	£3k	£3k	£6k
	Isolation to slaughter	3 animal reactors x 16 days		£0.1k	£0.1k
	Movement restriction on herd	213 animals x 295 days		£0.4k	£0.4k
	Short interval + gamma testing (incl. vet fee, admin, OH, tuberculin)	213 animals x 3.13 tests	£22k	£4k	£26k
	Total		£25k	£8k	£33k
Neighbouring herd	Additional tests on neighbouring farms and through tracing (tracing & radial - incl. vet fee, admin, OH, tuberculin)	2,338 animal tests	£6k	£8k	£14k
	Slaughter (incl. haulage, vet fee, compensation, isolation to slaughter)	0.3 animal reactors	£0.3k	£0.3k	£0.6k
	Movement restriction on herd	213 animals x 120 days		£0.2k	£0.2k
	Short interval + gamma testing (incl. vet fee, admin, OH, tuberculin)	213 animals x 3 SI skin tests and 1 gamma test	£8k	£3k	£11k
	Total		£14k	£12k	£26k
	Total		£39k	£20k	£59k

Table 5 – Average cost of a confirmed new incident (breakdown farm) of bovine TB in cattle in the LRA under option 1 (see table 11 for sources).

	Cost	Average units	Government	Farmer	Total
Breakdown farm	Slaughter (incl. haulage, vet fee, compensation)	1 animal reactors	£1k	£1k	£2k
	Isolation to slaughter	1 animal reactors x 16 days		£0.03k	£0.03k
	Movement restriction on herd	213 animals x 120 days		£0.2k	£0.2k
	Short interval + gamma testing (incl. vet fee, admin, OH, tuberculin)	213 animals x 3 tests	£22k	£4k	£26k
	20% of neighbouring herd controls		£3k	£2k	£5k
	Total		£26k	£8k	£34k

- 6.20 Summing the benefits to business (£0.4m) and to government (£0.5m) per year therefore gives a total within-herd benefit of £0.9million in savings on avoiding or reducing the costs of TB breakdowns. Table 6 shows how the benefits are split between farmers and government.

Table 6 – Within-herd total yearly benefits (central case summary)

Savings from	Farmer	Government
Avoided costs of new TB breakdowns (animals switched)	£0.1m	£0.2m
Reduced costs of breakdowns from post-MT	£0.3m	£0.3m
Total	£0.4m	£0.5m

- 6.21 There are between-herd benefits that accrue from avoiding the risk of disease spilling over into neighbouring farms and wildlife as a result of post-movement testing or preventing diseased cattle moving into the LRA and causing breakdowns. This is particularly important where animals are moved into relatively disease-free areas.
- 6.22 According to the pre-movement testing Regulatory Impact Assessment (2005)²⁹ 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 100 herds are affected.
- 6.23 By finding and removing those reactors identified by post-movement testing, or switching to buying cattle within the LRA the policy has reduced the risk of hotspots in the four-yearly tested area.
- 6.24 Combining the number of prevented breakdowns in the central case with the probability of controlled and uncontrolled hotspots and their respective costs provides estimates of the between-herd benefits of this policy (table 7).

Table 7 – Between-herd total yearly benefits (central case summary)

Hotspot avoided	Farmer	Government
Controlled	£46k	£96k
Uncontrolled	£6k	£12k
Total	£52k	£108k

Summing the benefit to farmers (£52,000) and government (£108,000) therefore gives a total between-herd benefit of £160,000 in savings on avoiding the costs of extra breakdowns in the LRA.

7. Total benefits

- 7.1 In order to estimate the total benefits of post-movement testing the aforementioned within and between benefits are combined (table 8).

Table 8 – Within-herd & between-herd yearly benefits estimate summary

Total benefits (average yearly)	Farmer	Government
Within-herd	£0.4m	£0.5m
Between-herd	£52k	£108k
Total	£0.5m	£0.6m

Summing the total benefit to farmers (£0.5m) and government (£0.6m) gives a total annual benefit of around £1.1m from the policy.

8. Unquantified benefits

- 8.1 Achieving OTF status for the LRA in the quickest possible time will provide benefits to cattle keepers and government through increased potential to trade internationally, especially live cattle, providing options for reducing surveillance and so disease control costs, and demonstrating progress towards achieving OTF for the whole of England.

²⁹ <http://archive.defra.gov.uk/foodfarm/farmanimal/diseases/atoz/tb/documents/prmt-regulatory.pdf>

- 8.2 In particular, if the LRA were to achieve OTF status and follow Scotland's approach, which exempted some 35% of cattle herds from routine four yearly surveillance testing, this could yield an estimated saving of around £1m per year (excluding any savings on APHA administration costs) to those responsible for covering the costs of testing. (see annex 1 on the potential advantages of OTF status for England).
- 8.3 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.
- 8.4 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 increase the chance of achieving OTF status for the LRA would provide further evidence of UK progress on, and commitment to, eradicating the disease.
- 8.5 Cattle farmers would face reduced stress of operating businesses under restrictions as well as the emotional impact of losing valued cattle. Without significant evidence in this area, these benefits are not taken into account in this assessment.
- 8.6 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 ATA.

9. Cost benefit analysis

Option 1 – Post-movement testing

- 9.1 Cost-benefit analysis estimates that the policy is likely to produce a total net cost of £5.0m, with average yearly cost of £1.6m. The benefits mostly accrue to Government however at an estimated £0.6m per year, imposing a net cost to business of around £1.1m per year (table 9).

Table 9 – Net benefit to business (central estimate)

		Average yearly	10 year present value
Farmer	Cost	£1.6m	£13.9m
	Benefit	£0.5m	£3.7m
	Net benefit	-£1.1m	-£10.2m
Government	Cost	£36k	£0.3m
	Benefit	£0.6m.	£5.5m
	Net benefit	£0.6m	£5.2m
Total	Cost	£1.6m	£14.2m
	Benefit	£1.1m	£9.2m
	Net benefit	-£0.5m	-£5.0m

10. Risks & uncertainties

Purchasing behaviour

- 10.1 The extent to which businesses may switch to buying cattle from within the LRA as opposed the annually-tested areas 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 ATA 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.

Level of TB infection pressure

- 10.2 There is uncertainty around future levels of TB and the amount disease actually found by post-movement testing. This affects the number of animal reactors found by post-movement testing and in turn the number

of breakdowns avoided from occurring 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, but the latest statistics show that incidence rate has been levelling off since around 2008.³⁰ Without detailed modelling of the epidemiology of TB in the LRA this analysis assumes constant rates of disease over the next 10 years. Using 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 a breakdown

- 10.3 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 tables 4, 5 and 11 – summary of assumptions, and provides a single point estimate based on taking averages. As such, due to the uncertainty around the average costs which make up the cost of a breakdown, we have conducted a sensitivity check which varies the cost by +/-10%.

Neighbouring herd controls under option 1

- 10.4 As post-movement testing has found animal reactors earlier than would otherwise be the case, then there is a reduced risk of onward spread and thereby the size and cost of a breakdown under option 1 is lessened. This affects the net benefit from the expected 26 breakdowns brought about earlier by post-movement testing. 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%.

Cattle moves

- 10.5 Due to uncertainty about the future number of animal moves, the central case assumes the current level remains constant going forward. While the evidence from the Agri-Food and Biosciences Institute (AFBI, 2012) suggests a contraction of 5% over the next 10 years, the impact of this would not produce a significant change in the size or order of the costs and benefits of the policy (i.e. any change in the number of animals uniformly changes costs and benefits). Therefore cattle movements are not varied as part of the analysis, as to do so would not have a material impact on the cost-benefit result.

Compliance and enforcement

- 10.6 Compliance is assumed to be 100% in this analysis consistent with the high levels of compliance seen for pre-movement testing³¹. 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.

Approved Finishing Units (AFU)

- 10.7 There is uncertainty over whether finishing herds in the LRA will register as Approved Finishing Units (AFUs). An AFU is a facility which provides a route for cattle producers to finish animals from both restricted and unrestricted farms. In the LRA AFUs may be approved in order to minimise the risk of importing infections into the TB low risk area; 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.
- 10.8 AFUs would be exempt from post-movement testing because they are subject to strict bio-security rules, are completely housed and only send cattle to slaughter. Therefore it is likely that some businesses may adjust their business structure in order to benefit from not having to pay for post-movement tests. This would benefit the policy objective in that those businesses that became AFUs are making a more risk-based decision by lowering the chance of spreading TB into the Low Risk Area because of their stricter biosecurity standards.
- 10.9 AFUs are also exempt from TB surveillance testing meaning farmers and government would save on the cost of routinely testing cattle every 4 years on premises that convert.
- 10.10 Improved biosecurity practices will likely have further benefits to keepers through improvement in broader cattle health.
- 10.11 There are likely and barriers, however, to becoming an AFU. For example, these could include how an AFU may not be an appropriate structure for some business models, the transition costs of finding out and adapting businesses practices, or the Agency (APHA) that approves an AFU having capacity constraints.

³⁰ Defra: <https://www.gov.uk/government/collections/bovine-tb>

³¹ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/365476/bovinetb-testing-20oct14.xls

The costs of converting are likely to vary across business with one industry source suggestions £1 per head of cattle over 5 years.

- 10.12 AFUs have not been included in this impact assessment due to the significant uncertainty and lack of robust data on the potential for farms to convert to an AFU. It is likely that farms which do convert will lower the overall cost of option 1.

11. Sensitivity analysis

- 11.1 Table 10 illustrates a possible 'worst' and 'best' case scenario, alongside the central case, using the above ranges to try and capture some of the uncertainty about the various parameters which could affect the costs and benefits of the policy.

Table 10 – Sensitivity checks on total costs and benefits of post-movement testing

Scenario value		Worst	Best	Central
Parameter				
Purchasing behaviour (% switching)		0%	34%	17%
Level of TB infection pressure		-2.2%	+2.2%	0%
Cost of a BAU breakdown +/- 10%		-10%	+10%	£59k
Cost of breakdown by Post-MT +/- 10%		-10%	+10%	£34k
Cost of neighbouring herd controls		40%	0%	20%
Cost of switching (per animal) +/- 10%		£8	£6	£7
Farmers (average yearly)	Cost	£1.8m	£1.5m	£1.6m
	Benefit	£0.3m	£0.6m	£0.5m
	Net benefit	-£1.5m	-£0.9m	-£1.1m
Government (average yearly)	Cost	£43k	£30k	£36k
	Benefit	£0.4m	£0.9m	£0.6m
	Net benefit	£0.4m	£0.9m	£0.6m
Total 10-year	Costs	£15.5m	£12.7m	£14.2m
	Benefits	£6.1m	£12.9m	£9.2m
	Net benefit (NPV)	-£9.4	£0.2m	-£5.0m

- 11.2 Table 10 estimates that in a potential 'worst' case scenario the ten-year total net benefit of post-movement testing could be close to -£9.4m, while in the 'best' case scenario this could be around £0.2m. Even in the best case scenario there is a net cost to business of £0.9m per year.
- 11.3 For monetised benefits to exceed monetised costs, to business, the costs of option 1 would need to fall by around 75%.³²

Assumptions & references

Table 11 – Summary of assumptions made

Description	Assumption	Source
Number of moves from annually tested areas of GB to LRA	147,680	Defra analysis of individual cattle movements data (APHA) 2011-13

³² In the central case (table 10) the average yearly benefit to farmers is £0.4m, which is 75% smaller in size than the corresponding £1.6m cost figure.

Number of moves from annually tested areas of GB to LRA to stay on farm for more than 120 days	126,419	
Average number of LRA farms receiving batches of 50 or more animals	116	
Average number of animals moved per year in batches of 50 animals or more	15,736	
Average batch size of cattle moved in batches of 50 animals or more	69	
Average number of LRA farms receiving batches of less than 50 animals	3,369	
Average number of animals moved per year in batches of less than 50 animals	110,683	
Average batch size of cattle moved in batches of less than 50 animals	7	
Animals requiring a post-movement test	88,787– 126,419	Defra analysis, calculated using data from SAM dataset (APHA, 2011-13) & applying potential switching range 0% - 34% based on Scotland pre-/post-movement testing
Animals switched to LRA (no post-movement test required)	0 – 37,632	Defra analysis, calculated using data from SAM dataset (APHA, 2011-13) & applying potential switching range 0% - 34%
Vet fee per animal moved (2014 prices)	£4.55 - £11.40	Pre-movement testing review, table 14 page 90 (2010) http://archive.defra.gov.uk/foodfarm/farmanimal/diseases/atoz/tb/documents/pre-movement-testing-review.pdf
Labour cost per animal (2014 prices) including non-wage costs (30%)	£3.34	
Unit cost of Tuberculin	£0.3	APHA advice
Cost of switching buying location, per animal	£7.35	Half the cost of testing as an indication
Average herd size (LRA)	213	Data from the SAM dataset, APHA 2013
Average number of animals slaughtered per OTFW breakdown (LRA)	3	APHA data used in http://www.defra.gov.uk/ahvla-en/files/pub-survreport-tb12e.pdf
Average number of days under movement restrictions per OTFW breakdown (LRA)	295	https://www.gov.uk/government/statistics/bovine-tb-surveillance-in-great-britain
Average number of days under movement restrictions per OTFS breakdown (LRA)	120	
Average number of short interval tests per OTFW breakdown (LRA)	3.13	
Average number of short interval tests per OTFS breakdown (LRA)	3	
Average compensation payment per animal slaughtered for TB (2014 prices)	£1,206	Data from the SAM dataset, APHA 2013
Gross economic loss per animal slaughtered for TB	£2,106	Reading Survey (2004) inflated www2.defra.gov.uk/research/Project_Data/More

		asp?l=SE3112&M=KWS&V=se3112&SUBMIT1=Search&SCOPE=0
Net economic loss per animal	£900	Gross economic loss minus compensation
Haulage, disposal & slaughter costs per animal	£81	APHA costs inflated, 2012
Average salvage received per animal slaughtered for TB	£325	Data from the SAM dataset, APHA 2013
Net cost to taxpayer of slaughter	£881	(Compensation + slaughter) - salvage
Isolation cost per animal slaughtered for TB, 16 day average per animal..	£23	Reading Survey (2004) inflated www2.defra.gov.uk/research/Project_Data/More.asp?l=SE3112&M=KWS&V=se3112&SUBMIT1=Search&SCOPE=0
Testing fee per animal (vet fees, T&S, admin, overheads)	£3.72	SAM dataset, APHA 2013
Movement restrictions cost per animal	£1.97	Sam dataset, APHA 2013
Probability of finding infection	0.000262	Defra analysis of data from SAM dataset, APHA 2013
Batch factor (to account for fact that two animals may end up at one farm resulting in over counting of number of new incidents of TB)	0.9254	Pre-movement testing review (2010) http://archive.defra.gov.uk/foodfarm/farmanimal/diseases/atoz/tb/documents/pre-movement-testing-review.pdf
Chance of controlled hotspot	0.02	
Number of herds in controlled hotspot	4	
Chance of 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 TB stats (2008-13) https://www.gov.uk/government/statistics/incidence-of-tuberculosis-tb-in-cattle-in-great-britain

12. Wider Impacts

Economic Impacts

Small and Micro Business Assessment

In 2012/13 the average number of employees across all sizes of lowland grazing livestock (cattle farming) was 2.1, and just 4.9 for the largest farms.³³ The direct business costs outlined above of £0.9m for the preferred option are therefore likely to fall entirely on micro-businesses. An exemption for small or micro businesses would undermine the effectiveness of the policy and cannot be granted.

13. One In, Two Out (OITO)

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 policy generates an annual net cost to business of £0.9million (in 2009 prices, discounted to 2010).

³³ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/267479/fbs-farmaccountsengland-19dec13.pdf

Annex 1 – Benefits of achieving OTF status in England

Potential Advantages of OTF Status

Avoiding additional costs of disease

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

1. 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.
2. Scotland achieved OTF status as a UK region in 2009³⁴. 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.
3. 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

4. In an OTF Member State or region, routine herd surveillance testing of herds may be reduced or stopped. Table 1 compares routine herd surveillance testing in Scotland and the LRA. Scotland's approach has exempted some 35% of cattle herds from routine four yearly herd testing. Such an approach in England could yield an estimated saving of around £1m per year (excluding any savings on APHA administration costs) for those responsible for covering the costs of testing.

Table 1: 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 -Herds with fewer than 20 cattle with no more than one consignment moved on from a high risk area in the last four years. -Herds where 25% of cattle are slaughtered annually, and no more than one consignment moved on from a high risk area in the last four years. - Herds where more than 40% of stock slaughtered annually over a four year period.	Four yearly of all herds ²

¹ Routine Herd Testing involves testing of breeding animals over two years old.

² Individual herds in the LRA deemed 'high risk' may be subject to annual Whole Herd Testing.

Promoting international trade

5. 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.
6. 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,

³⁴ Commission Decision 2009/761/EC declaring that Scotland is Officially Free of Bovine TB

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

7. 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

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 2 – EANCB calculations

Table A2.1 – EANCB calculation low benefit/high cost scenario

low benefit/high	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	PV	EA
Total cost	£1,752,134	£1,752,134	£1,752,134	£1,752,134	£1,752,134	£1,752,134	£1,752,134	£1,752,134	£1,752,134	£1,752,134	£15,081,822	£1,379,380
Total benefit	£335,797	£328,358	£321,083	£313,970	£307,014	£300,212	£293,561	£287,057	£280,698	£274,479	£2,635,277	£264,358
Total net benefit	-£1,416,337	-£1,423,777	-£1,431,051	-£1,438,165	-£1,445,121	-£1,451,922	-£1,458,573	-£1,465,077	-£1,471,437	-£1,477,655	-£12,446,545	-£1,115,021

Table A2.2 – EANCB calculation central scenario

Central	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	PV	EA
Total cost	£1,613,753	£1,613,753	£1,613,753	£1,613,753	£1,613,753	£1,613,753	£1,613,753	£1,613,753	£1,613,753	£1,613,753	£13,890,679	£1,270,438
Total benefit	£425,521	£425,521	£425,521	£425,521	£425,521	£425,521	£425,521	£425,521	£425,521	£425,521	£3,662,751	£334,994
Total net benefit	-£1,188,232	-£1,188,232	-£1,188,232	-£1,188,232	-£1,188,232	-£1,188,232	-£1,188,232	-£1,188,232	-£1,188,232	-£1,188,232	-£10,227,928	-£935,444

Table A2.3 – EANCB calculation high benefit/low cost scenario

high benefit/low	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	PV	EA
Total cost	£1,447,695	£1,447,695	£1,447,695	£1,447,695	£1,447,695	£1,447,695	£1,447,695	£1,447,695	£1,447,695	£1,447,695	£12,461,308	£1,139,708
Total benefit	£514,018	£525,405	£537,045	£548,943	£561,105	£573,536	£586,242	£599,230	£612,506	£626,076	£4,862,395	£404,664
Total net benefit	-£933,678	-£922,290	-£910,650	-£898,752	-£886,590	-£874,159	-£861,453	-£848,465	-£835,189	-£821,620	-£7,598,913	-£735,044