Regional Six-monthly Report of Descriptive Bovine TB Epidemiology for the Low Risk (Four Yearly Testing) Areas of England

Regional Office:
SE Region

Mid-year (first six months) 2017

1. Cattle Industry in the Region

For the purposes of this report, the South East Region of the Animal and Plant Health Agency (APHA) in England has been split into practical working areas (groups of counties) that are overseen on a regional basis—

- Zone 1 – Norfolk (28) and Suffolk (38).
- Zone 2 – Cambridgeshire (05), Bedfordshire (01), Hertfordshire (18), Essex (13), Greater London North (26) and Greater London South (27).
- Zone 3 – Surrey (40), Kent (20) and West Sussex (42).
- Zone 4 – Isle of Wight (16).

Note: cattle herds in the remaining counties to the west of the Southeast region and East Sussex (shown with no background colour) are subject to annual testing, as those counties are fully in the Edge Area (Hampshire, Berkshire, Buckinghamshire), or straddle the Edge and the High Risk Areas, (Oxfordshire and East Sussex).
The majority of the cattle farmed in the east of the Region (Zones 1 and 2) are in the north of the area i.e. Norfolk. The herd types are predominantly fattening, with a reasonable number of suckler herds, and fewer and fewer dairy herds. Cattle for finishing, or stores, are traditionally bought in from other areas of the country for finishing on areas of grazing that are unsuitable for arable production, or on grain/by-products from that arable production. The areas that cattle are purchased from are often the higher risk areas of the Midlands and South West.

In the southern counties (Zone 3), the highest densities of cattle are in southern Surrey, and Sussex including the South Downs. All of East Sussex is now on annual testing county due to the endemic low incidence of badger TB in the southern part of the county. Farm types are similar to the East with finishing, store and suckler herds predominating, with fewer and generally larger dairy herds. Surrey, particularly to the north, has many smaller herds. Kent has a generally low density of cattle, but a mix of herd types similar to the rest of the zone. It is more and more common that a cattle herd has no contiguous cattle neighbours in these areas.

Dairying used to predominate on the Isle of Wight, but there are now less than 20 herds remaining, dropping from around 150 herds in the 1980s. There are some cattle breeders on the Island that are taking advantage of their disease free (including bTB) status to enhance the values of their sales to farms on the mainland.

Norfolk and West Sussex have both previously exceeded the threshold to remain on four-yearly testing, and any increases in bTB incidence could see their four-yearly testing status threatened. The Isle of Wight could easily be in a similar situation, due to its small size and like other parts of the South East, the risk of disease introduction is due to the many cattle movements onto the island.

The South East Region is a net importer of cattle. There are only a few relatively low volume cattle markets remaining in the Region. The majority of the larger finishers in South East have to source their cattle from the higher bTB risk areas due to the numbers required at one time to maintain the size of production groups.

There is currently no evidence of infection in the wildlife in any of the counties in the Low Risk Area (LRA) of the SE Region. Culled deer are routinely inspected by hunters and on occasion suspicious lesions are reported to APHA, but no M. bovis infection has been identified to date.

There are four Licensed Finishing Units (LFUs) operating in the LRA counties of the SE Region for the indoor fattening of cattle destined for slaughter. These units are kept under movement restrictions (OTF status suspended) and can only accept, as a rule, cattle from OTF herds that have been subject to statutory pre-movement TB testing with negative results, where required.
Number of cattle premises by size band in the division at 1 January of the reporting year.

<table>
<thead>
<tr>
<th>COUNTY</th>
<th>0</th>
<th>1-50</th>
<th>51-100</th>
<th>101-200</th>
<th>201-350</th>
<th>351-500</th>
<th>501+</th>
<th>All</th>
<th>Mean</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>BEDFORDSHIRE</td>
<td>111</td>
<td>24</td>
<td>19</td>
<td>9</td>
<td>2</td>
<td>4</td>
<td>169</td>
<td>76</td>
<td>29</td>
<td></td>
</tr>
<tr>
<td>CAMBRIDGESHIRE</td>
<td>1</td>
<td>198</td>
<td>51</td>
<td>39</td>
<td>17</td>
<td>8</td>
<td>322</td>
<td>86</td>
<td>28</td>
<td></td>
</tr>
<tr>
<td>ESSEX</td>
<td>6</td>
<td>274</td>
<td>62</td>
<td>27</td>
<td>27</td>
<td>5</td>
<td>411</td>
<td>68</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>ISLE OF WIGHT</td>
<td>90</td>
<td>20</td>
<td>25</td>
<td>8</td>
<td>6</td>
<td>1</td>
<td>150</td>
<td>79</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td>HERTFORDSHIRE</td>
<td>1</td>
<td>147</td>
<td>32</td>
<td>26</td>
<td>7</td>
<td>3</td>
<td>217</td>
<td>56</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>KENT</td>
<td>14</td>
<td>393</td>
<td>99</td>
<td>67</td>
<td>43</td>
<td>22</td>
<td>656</td>
<td>90</td>
<td>29</td>
<td></td>
</tr>
<tr>
<td>GREATER LONDON</td>
<td>4</td>
<td>22</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>30</td>
<td>19</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>GREATER LONDON</td>
<td>1</td>
<td>30</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>36</td>
<td>31</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>NORFOLK</td>
<td>5</td>
<td>513</td>
<td>127</td>
<td>117</td>
<td>60</td>
<td>16</td>
<td>860</td>
<td>89</td>
<td>33</td>
<td></td>
</tr>
<tr>
<td>SUFFOLK</td>
<td>5</td>
<td>305</td>
<td>78</td>
<td>58</td>
<td>17</td>
<td>10</td>
<td>484</td>
<td>71</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>SURREY</td>
<td>4</td>
<td>198</td>
<td>40</td>
<td>30</td>
<td>17</td>
<td>12</td>
<td>312</td>
<td>88</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>WEST SUSSEX</td>
<td>14</td>
<td>245</td>
<td>52</td>
<td>65</td>
<td>41</td>
<td>20</td>
<td>455</td>
<td>108</td>
<td>36</td>
<td></td>
</tr>
</tbody>
</table>

Cattle breed purpose - numbers and percentages at 1 January of the reporting year.

<table>
<thead>
<tr>
<th>COUNTY</th>
<th>Beef</th>
<th>Dairy</th>
<th>Dual Breed</th>
<th>Unknown</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>BEDFORDSHIRE</td>
<td>9873 (76.8%)</td>
<td>2528 (19.7%)</td>
<td>460 (3.6%)</td>
<td>2 (0.0%)</td>
<td>12863</td>
</tr>
<tr>
<td>CAMBRIDGESHIRE</td>
<td>20370 (73.7%)</td>
<td>6047 (21.9%)</td>
<td>1215 (4.4%)</td>
<td>0 (0.0%)</td>
<td>27632</td>
</tr>
<tr>
<td>ESSEX</td>
<td>20436 (73.2%)</td>
<td>6144 (22.0%)</td>
<td>1312 (4.7%)</td>
<td>10 (0.0%)</td>
<td>27902</td>
</tr>
<tr>
<td>ISLE OF WIGHT</td>
<td>8065 (67.7%)</td>
<td>3600 (30.2%)</td>
<td>252 (2.1%)</td>
<td>2 (0.0%)</td>
<td>11919</td>
</tr>
<tr>
<td>HERTFORDSHIRE</td>
<td>9576 (78.7%)</td>
<td>2022 (16.6%)</td>
<td>566 (4.6%)</td>
<td>9 (0.1%)</td>
<td>12173</td>
</tr>
<tr>
<td>KENT</td>
<td>36575 (61.9%)</td>
<td>21480 (36.3%)</td>
<td>1048 (1.8%)</td>
<td>9 (0.0%)</td>
<td>59112</td>
</tr>
<tr>
<td>GREATER LONDON</td>
<td>463 (83.3%)</td>
<td>33 (5.9%)</td>
<td>60 (10.8%)</td>
<td>0 (0.0%)</td>
<td>556</td>
</tr>
<tr>
<td>GREATER LONDON</td>
<td>629 (55.7%)</td>
<td>450 (39.8%)</td>
<td>51 (4.5%)</td>
<td>0 (0.0%)</td>
<td>1130</td>
</tr>
<tr>
<td>NORFOLK</td>
<td>58505 (76.8%)</td>
<td>14296 (18.8%)</td>
<td>3349 (4.4%)</td>
<td>30 (0.0%)</td>
<td>76180</td>
</tr>
<tr>
<td>SUFFOLK</td>
<td>23685 (68.9%)</td>
<td>6967 (20.3%)</td>
<td>3702 (10.8%)</td>
<td>11 (0.0%)</td>
<td>34365</td>
</tr>
<tr>
<td>SURREY</td>
<td>15696 (56.9%)</td>
<td>10807 (39.2%)</td>
<td>1098 (4.0%)</td>
<td>0 (0.0%)</td>
<td>27601</td>
</tr>
<tr>
<td>WEST SUSSEX</td>
<td>24149 (49.1%)</td>
<td>22755 (46.3%)</td>
<td>2258 (4.6%)</td>
<td>12 (0.0%)</td>
<td>49174</td>
</tr>
</tbody>
</table>
Density of cattle and cattle premises at 1 January of the reporting year.

ZONE 1

Map - Cattle per square km

Map - Number of premises per 100 square km
ZONE 2

Map - Cattle per square km

Map - Number of premises per 100 square km
2. Geographical Distribution of Bovine TB Breakdowns in the Region

ZONE 1

Legend
▲ 2017 OTFW
▼ Pre 2017 OTFW
▲ OTFS 2017

OTFW Other Species
P: M. bovis isolated in Pig
South East Zone 1

ZONE 2

Legend
▲ 2017 OTFW
▼ Pre 2017 OTFW
▲ OTFS 2017

CAMBRIDGESHIRE
BEDFORDSHIRE
HERTFORDSHIRE
ESSEX
GREATER LONDON

Holdings/100km:
0
0 - 25
250 - 50
50 - 75
75 - 100
100 - 136

Creator: IMT GIS
Source: Sam
OTFW data as at 21st of August 2017
OTFS data as at 21st of August 2017
CTD Density data at 31st of December 2016
Ref. 20170901_SEZ1
Product No.: 28

Holdings/100km:
0
0 - 25
250 - 50
50 - 75
75 - 100
100 - 136

Creator: IMT GIS
Source: Sam
OTFW data as at 21st of August 2017
OTFS data as at 21st of August 2017
CTD Density data at 31st of December 2016
Ref. 20170901_SEZ2
Product No.: 29
3. Summary of the Regional Headline Cattle TB Statistics

There were eight new OTFW breakdowns in the LRA of the South East region in the first six months of 2017. There were four OTFW breakdowns from 2016 still opened at the end of the reporting period.

The counties of East Sussex, Hampshire, Berkshire, Buckinghamshire and Oxfordshire are not included in this report as they are now annual TB testing counties and not part of the LRA in the Southeast Region. The 2017 OTFW breakdowns are briefly summarised in Section 8 in this report. The testing results of herds within a 3km radius of all the new OTFW breakdowns (radial testing) have also been included in the individual OTFW breakdowns summaries.

<table>
<thead>
<tr>
<th>Herd-level statistics</th>
<th>Zone 1</th>
<th>Zone 2</th>
<th>Zone 3</th>
<th>Zone 4</th>
<th>Total SE Region</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) <strong>Total number of cattle herds live on Sam at the end of the reporting period</strong></td>
<td>1,572</td>
<td>1,339</td>
<td>1,579</td>
<td>161</td>
<td>4,651</td>
</tr>
<tr>
<td>(b) <strong>Total number of cattle herds subject to annual TB testing at the end of the reporting period (any reason)</strong></td>
<td>89</td>
<td>101</td>
<td>138</td>
<td>30</td>
<td>358</td>
</tr>
<tr>
<td>(c) <strong>Total number of herd tests carried out in the period</strong></td>
<td>330</td>
<td>231</td>
<td>293</td>
<td>62</td>
<td>916</td>
</tr>
<tr>
<td>(d) <strong>Total number of OTF cattle herds TB tested during the period for any reason</strong></td>
<td>192</td>
<td>166</td>
<td>166</td>
<td>31</td>
<td>555</td>
</tr>
<tr>
<td>(e) <strong>Total number of OTF cattle herds at the end of the report period (i.e. herds not under any type of TB2 restrictions)</strong></td>
<td>1,553</td>
<td>1,341</td>
<td>1,547</td>
<td>159</td>
<td>4,600</td>
</tr>
<tr>
<td>(f) <strong>Total number of cattle herds that were not under restrictions due to an ongoing TB breakdown at the end of the report period.</strong></td>
<td>1,566</td>
<td>1,356</td>
<td>1,570</td>
<td>160</td>
<td>4,652</td>
</tr>
<tr>
<td>(g) <strong>Total number of new TB breakdowns detected in cattle herds during the report period</strong></td>
<td>5</td>
<td>3</td>
<td>10</td>
<td>0</td>
<td>18</td>
</tr>
<tr>
<td>- <strong>OTF status suspended (OTFS)</strong></td>
<td>2</td>
<td>1</td>
<td>7</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>- <strong>OTF status withdrawn (OTFW)</strong></td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>(h) Of the new OTFW herd breakdowns, how many:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- occurred in a holding affected by another OTFW breakdown in the previous three years?</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>- could be considered secondary to a primary breakdown based on current evidence?</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>- were triggered by skin test reactors or 2xIRs at routine herd tests?</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>- were triggered by skin test reactors or 2xIRs at other TB test types (forward and back-tracings, contiguous, check tests, post-movement tests, etc.)?</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>- were first detected through routine slaughterhouse TB surveillance?</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>(i) <strong>Number of new breakdowns revealed by enhanced TB surveillance (radial testing) conducted around those OTFW herds</strong></td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>- <strong>OTFS</strong></td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>- <strong>OTFW</strong></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>(j) <strong>Number of OTFW herds still open at the end of the period (including any ongoing OTFW breakdowns that began in a previous reporting period)</strong></td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>4</td>
</tr>
</tbody>
</table>
(k) New confirmed (positive *Mycobacterium. bovis* culture) incidents in non-bovine species detected during the report period (indicate host species involved) | 0 | 1 (alpaca) | 0 | 0 | 1

<table>
<thead>
<tr>
<th>Animal-level statistics (cattle)</th>
<th>Zone 1</th>
<th>Zone 2</th>
<th>Zone 3</th>
<th>Zone 4</th>
<th>Total SE Region</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Total number of cattle tested in the period (animal tests)</td>
<td>16,410</td>
<td>11,996</td>
<td>27,282</td>
<td>3,307</td>
<td>58,995</td>
</tr>
<tr>
<td>(b) Reactors detected:</td>
<td>39</td>
<td>15</td>
<td>62</td>
<td>43</td>
<td>159</td>
</tr>
<tr>
<td>• tuberculin skin test</td>
<td>7</td>
<td>4</td>
<td>33</td>
<td>6</td>
<td>50</td>
</tr>
<tr>
<td>• additional IFN-gamma blood test reactors (skin-test negative or IR animals)</td>
<td>32</td>
<td>11</td>
<td>29</td>
<td>37</td>
<td>109</td>
</tr>
<tr>
<td>(c) Reactors per breakdown</td>
<td>7.8</td>
<td>5</td>
<td>6.2</td>
<td>43</td>
<td>62</td>
</tr>
<tr>
<td>(d) Reactors per 1000 animal tests</td>
<td>2.38</td>
<td>1.25</td>
<td>2.27</td>
<td>13</td>
<td>2.69</td>
</tr>
<tr>
<td>(e) Additional animals identified for slaughter for TB control reasons (DCs, including any first-time IRs)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>(f) SLH cases (tuberculous carcasses) reported by FSA</td>
<td>1</td>
<td>1</td>
<td>8</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>(g) SLH cases confirmed by culture of M. bovis</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
</tbody>
</table>
Density of TB reactors and slaughterhouse cases in TB breakdowns per km²

Density of skin test reactors, IFN-gamma test reactors and slaughterhouse cases in Officially TB Free Status Withdrawn (OTFW) breakdowns per km² taken in the reporting period

Density of skin test reactors, IFN-gamma test reactors and slaughterhouse cases in OTFW and Officially TB Free Suspended (OTFS) breakdowns per km² taken in the reporting period
4. Suspected Sources of *M. bovis* Infection for all the New OTFW Breakdowns Identified in the Report Period

<table>
<thead>
<tr>
<th>Most likely origin</th>
<th>Provisional</th>
<th>Final</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction (e.g. purchase) of infected animal(s)</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Local - lateral spread from neighbouring holdings:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- exposure to infected wildlife e.g. badgers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- other farmed species</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- recrudescence of residual infection from a previous TB breakdown</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- infected human source</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Undetermined/obscure</td>
<td>2*</td>
<td></td>
</tr>
<tr>
<td>Other (explain)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* OTFW under ‘potential hotspot' procedures as source of infection is undetermined at present.
* OTFW undetermined source pending further test results.

<table>
<thead>
<tr>
<th>Probability of isolated, sporadic ('one-off') breakdown, without secondary local spread from the index case</th>
</tr>
</thead>
<tbody>
<tr>
<td>Likely (no secondary breakdowns detected)</td>
</tr>
<tr>
<td>Definite</td>
</tr>
<tr>
<td>Likely</td>
</tr>
<tr>
<td>Possible</td>
</tr>
<tr>
<td>Not likely (indigenous infection in the locality)</td>
</tr>
</tbody>
</table>

5. Overview of the bTB Eradication Programme in the Region

- There have been no changes in routine skin testing surveillance policy.
- No known cases of human *M. bovis* infection in the Region attributable to contact with infected animals.
- There were no known non-specific and fraudulent skin test reactors.
- No breakdowns involving producer-retailers of unpasteurised cows’ milk or on open farms.
- During this reporting period there has been one formal meeting with the Resilient Forum to discuss TB matters.
- Overall results of radial bTB surveillance have been detailed in individual case summaries in section 8 of this report. There have been one exemption from radial testing granted during this reporting period.
- Compulsory post-movement testing of cattle entering the Low Risk Area (LRA) of England from annual (or more frequent) TB testing areas of GB introduced in April 2016 has supplemented pre-movement
testing and enhanced the sensitivity of the TB surveillance regime. From all the new OTFW disclosed during the reporting period large percentage of OTFW (75%) has been disclosed at post-movement test (PoMTs).

6. **Wildlife**
There have been no reports of *M. bovis*-infected wildlife from the South East Low Risk Area.

7. **Other Susceptible Species**
In the South East Low Risk Area there has been one culture positive of *M. bovis* in alpaca (Cambridgeshire) genotyping is pending.

8. **Individual summaries of new OTFW breakdowns detected in the region during the report period and ongoing breakdowns from previous years still open at the end of the report period, grouped by county**

8.1 **Individual summary of new breakdowns detected in the first half of 2017**

**Norfolk**
Kings Lynn, Norfolk.

This holding is a small fattening herd with approximately 70 cattle. The farmer buys in 12 month of age cattle and fattens up to 25 to 30 months old and sends them directly to slaughter. Cattle are out wintered on a low stocking density of 1 animal per 2 acres. All the cattle is purchased in batches, usually in November, finished in two straw yards close to farm and are sent directly to slaughter. There is also a total of five hundred sheep. Sheep along river Great Ouse. Sheep are slaughtered in line with cattle to supply local butchers.

On 24/2/17 an inconclusive reactor was disclosed at a post movement test. The inconclusive reactor became a reactor at re-test on 8/5/17 (with visible lesions at post mortem, isolating *M. bovis*). This animal was born in a holding in Cornwall (genotype 9:a isolated in 2011 and 2012), moved to this farm in December 2016 and taken as skin reactor in May 2017. There is no spoligotype information available in Crystal.

The first short interval (SI) and IFN-γ parallel tests carried out on 8/8/17 disclosed one gamma reactor with non-visible lesions at post-mortem (NVL). The second short interval test has been scheduled in October.

This holding had a previous confirmed breakdown in 2014 (OTFW isolating genotype 15:a).

The likely origin of the current incident is purchase of infected cattle from high risk areas (Cornwall) since all the animals are bought in. Furthermore, the reactor was on holding for a short period of time before being disclosed as reactor (five months) suggesting that it could be already infected.

RAD zone has been established around this farm that includes twelve holdings. To date radial test results (RAD0) have been negative.

**Wisbech, Norfolk.**

A fattening enterprise with cattle purchased at 12 months of age from the West Country through a market in Taunton and sold between twenty four to thirty months of age. Cattle are bought in to fat and are sent directly to slaughter.

On 10/1/2017 test three skin reactors and five inconclusive reactors were disclosed at post movement TB testing. Only one reactor that came originally from Devon had visible lesions at post mortem. *M. bovis* was isolated on 31/3/17, however spoligotype is not available. The other two skin reactors showed no visible lesions at post-mortem. All three reactors and five inconclusive reactors came originally from high risk areas although from different holdings in the South West country.
The check test carried out on 17/2/17 was clear. The first short interval (SI) and IFN-γ parallel test were completed on 24/4/17 and 15/5/17 respectively disclosing seven IFN-γ test reactors- all with non-visible lesions at post-mortem. The second short interval test (SI) was clear in August. Restrictions were lifted on 29/8/17.

This holding had a confirmed breakdown in the previous three years (OTFW in 2015, isolating genotype 17:a).

The origin of this incident is purchased infected cattle from high risk areas since all the reactors are purchased. However, in absence of a genotype result for the only *M. bovis* isolate in this herd, this can only be presumed.

RAD zone has been established around this farm that includes five holdings. To date radial test results (RAD0) have been negative. The next radial test for the zone (RAD6) in February 2018.

**Suffolk**

Halesworth, Suffolk

Medium-sized fattening business comprising two enterprises, one for fattening cattle and in the other side of the road finishing veal (rose). The farmer buys calves from high risk areas and finishes to slaughter weight. Occasionally sells store cattle.

On 19/1/17 one reactor veal calf was disclosed at post movement test (visible lesions at post-mortem, spoligotype 9, genotype pending). The farm of origin in Devon had a confirmed breakdown in March 2017 isolating genotype 9:e.

The check test carried out at the end of January had clear results. The first short interval (SI) and interferon-gamma parallel tests carried out on 2/5/17 disclosed twenty five gamma reactors with non-visible lesions at post-mortem (NVL).The second short interval test (SI) in July was clear and restrictions were lifted on 24/7/17.

The origin of this incident is purchased infected cattle from high risk areas.

RAD zone has been established around this farm that includes fifteen holdings. Due to unforeseen circumstances there was a delay in setting up the zone, so no radial test results (RAD0) are available yet.

**Essex**

Great Oakley, Essex

The farm rears bought-in store heifers (70%) and steers (30%). The animals are bought aged between 8-15 months usually during the months between September- November each year. Animals are mainly purchased from either Sedgemoor Livestock Market or Frome Livestock Market (both in Somerset) meaning that most of the animals are purchased from the high risk South West area.

The cattle are wintered on the farm in close contact sheds and graze the land during the summer months. The farm then sells the animals to a finishing farm from July onwards. In recent years, most of these animals have gone to a finishing farm in Norfolk, and very occasionally directly to slaughter. Stores do not remain on the farm for longer than 15 months as a general rule. There are no linked premises to this location and the animals remain as one epidemiological group.

On 9/1/17 a reactor was disclosed at post movement test (with non-visible lesions at post-mortem, but *M. bovis* isolated. No genotype available). The animal was born in a holding in Somerset, moved to a holding in Avon prior to getting sold through Sedgemoor to this premises.

Check test carried out on 7/2/17 had negative results. The first short interval (SI) and IFN-γ parallel test were completed on 10/4/17 disclosing two gamma reactors (both with non-visible lesions at post-mortem). The second short interval test carried out in June had negative results. Restrictions were lifted on 20/6/17.

The origin of this incident is purchased infected cattle from high risk areas since all the reactors are purchased. However, in absence of spoligotype information this can only be presumed.
No radial testing surveillance zone has been established within 3 km of this breakdown because this holding was granted an exemption by policy on 6/4/17

**Bedfordshire**  
**Colmworth, Bedfordshire**

Small-sized fattener herd with approximately 110 animals on holding. Farmer buys in cattle for fattening from Bishops Castle Market and other markets.

On 30/5/17 an animal was disclosed as reactor at post movement test (spoligotype 35, genotype is pending). The check test (CT) carried out on 12/6/17 disclosed one inconclusive reactor (IR).

The first short interval (SI) and IFN-γ parallel test were completed on 21/8/17 with clear results. The second short interval test has been scheduled in October. The reactor came originally from a holding in Shropshire on 23 February. This holding has had numerous culture positives in recent years isolating genotype 35:a.

The origin of this incident is purchased infected cattle from high risk areas (Shropshire).

The RAD zone has been established around this farm that includes seven holdings. To date radial test results have been negative.

**Surrey**  
**Cranleigh, Surrey.**

Large size suckler herd with approximately 473 cattle on holding. Beef cattle herd with cows producing own calves for rearing. Calves are weaned at 8 months, then finished and sold to the slaughterhouse. Stock replacements are purchased from markets, then finished and send directly to slaughter. Herd is grazing in fields around the farm during the summer and housed during winter months except from the young stock that is permanently kept in barns.

On 28/3/17 two reactors were disclosed at post-movement test (with visible lesions at post-mortem). The first reactor was resident at a holding in Staffordshire. The second reactor was born in Warwickshire and was resident in this holding of birth until 18/3/16. This holding in Warwickshire lost its OTF status on 14/12/2015 isolating genotype 10:a. This reactor was tested negative at two short interval tests at another premises. Both reactors moved from their respective holdings of birth directly to a holding in Oxfordshire where both stayed from March 2016 to 13/1/17 before moving to this farm. These two reactors, which were purchased together in a group of fourteen replacement heifers, tested negative at the pre-movement test on 23/8/16.

*M. bovis* was isolated on 9/7/17 from both reactors, but there is no spoligotype available.

The check test (CT) carried out on 24/4/17 was clear. The first short interval (SI) and IFN-γ parallel test were completed on 26/6/17 disclosing one reactor (UK261065501712), one inconclusive reactor and twelve gamma reactors (all with non-visible lesions at post-mortem). A further slaughterhouse case was also disclosed on 14/7/17.

The second short interval test has been scheduled early October.

Previous breakdown in 2016 that ended on 9/2/17 was linked to movements on holding of infected cattle from the High Risk Area of East Sussex (genotype 13:a).

The origin of this incident cannot be ascertained as there is incomplete data. It could be recrudescent from the previous 2016 breakdown or more likely purchased infected cattle from Warwickshire.

Radial testing zone has been established within 3km of this breakdown that includes forty two holdings. Radial testing has revealed one reactor (with non-visible lesions) in one holding and one inconclusive reactor retested clear in to date. The zone is due to RAD6 in February 2018.

**West Sussex**
Thakeham, West Sussex.

Main business is a medium-sized dairy herd with approximately 300 cattle plus a small suckler herd with fifty animals. Calving is done in blocks in July and August for the dairy and October-November for beef unit. Cattle are grazing from spring until October on fields around the farm and housed in buildings during the winter months. There are a few cattle farmers in the vicinity but there are not contiguous and there is not possibility of direct contact with Mrs Binnington's cattle.

This holding had a slaughterhouse case (homebred) on 20/4/17. Disease was confirmed on 10/6/17 isolating spoligotype 9, genotype is pending.

On 8/5/17 a check test had clear results. The first short interval (SI) and IFN-γ parallel test were completed on 10/7/17 disclosing 7 inconclusive reactors (one purchased from a holding in Kent, six homebred) and 10 gamma reactors, one purchased from a holding in Berkshire and nine homebred (4 with non-visible lesions at post-mortem). The second short interval test has been scheduled in September early October.

One possible source of infection could be attributed to movements on to the holding of a breeding bull. The bull originally from Kent moved on to the premises where it stayed for a short period of time (28/2/15 to 25/4/15). This bull has moved location several times to different holdings within the low risk area before moving to this farm. One of these holdings is in East Sussex. This holding had its OTF status suspended on 30/8/16, disclosing six skin reactors (all with non-visible lesions at post-mortem).

Another potential source of infection could be related to movements off to a show. The farmer took a few heifers to a show in Oxfordshire Edge from 03/08/16 to 07/08/16. This movement could expose them to contract infected from undisclosed infected animals.

The origin of this incident is still under investigation pending further results from the second short interval test and genotype information.

RAD zone has been established around this farm that includes thirty two holdings. To date radial test results have been negative.

Petworth, West Sussex

The farmer runs a dairy herd of approximately 270 dairy and a small suckler herd with approximately 55 animals. Calving is done in blocks around August time. Calves are reared in a building located a few miles away from main holding.

This holding had a homebred slaughterhouse case on 12/4/17. This was confirmed by isolation of M. bovis genotype 11:a. The check test (CT) was carried out on 9/5/17 disclosing 13 homebred reactors (eight with visible lesions at post-mortem).

The first short interval (SI) and interferon-gamma parallel tests carried out in July 2017 disclosed five homebred skin reactors (only one with visible lesions), one inconclusive reactor and seven homebred gamma reactors (6 with non-visible lesions at post-mortem). All the reactors disclosed to date are homebred. The next short interval has been scheduled at the end of September. Movements for animals on holdings confirmed that no animals have been living in homerange areas of genotype 11:a. Only five animals moved on from three different holdings in West Sussex, all with clear TB history.

The origin of this breakdown has not been clearly established and it has been assessed against the hotspot criteria for recommendation for hotspot procedures.

A RAD testing zone has been established around this farm that includes twenty holdings. To date radial test results have been negative.
8.2 Individual summary of ongoing breakdowns from previous years still open at the end of the report period, grouped by county.

Cambridgeshire
Haddon, Peterborough.

Small-sized beef fattening herd with approximately 117 cattle in the herd. The farmer does not have breeding stock. This holding purchases from various sales and markets, mainly Melton Mowbray Market and Thrapston Livestock Centre, sells a few heifers privately (usually around April time) and rest of the cattle are finished and sent directly to slaughter.

On 29/12/16 a Charolais female tested positive at post-movement testing (with visible lesions at post-mortem, isolating genotype 17:a. The reactor was born on 19/9/15 at in Wiltshire (High Risk Area).

This holding sustained an OTFW breakdown in March 2016, isolating genotype 17:a. The first short interval (SI) and interferon-gamma parallel tests carried out in March 2017 disclosed one gamma reactor with non-visible lesions at post-mortem (NVL). The second short interval test (SI) in June was clear and restrictions were lifted on 28/7/17.

The origin of this breakdown has been assessed as purchased origin since the farm of the origin of the purchased reactor had spoligotype 17.

RAD zone has been established around this farm that includes ten holdings. To date radial test results have been negative. The next radial test (RAD6) is due in November 2017.

Essex
Great Leighs, Chelmsford.

Medium-sized beef cattle herd. This beef farm is made up of three main groups, one group purchased fatteners/finishers (approximately 150 cattle). Second group kept at another premises is used for homebred suckler herd (90 cattle). The third group is kept at the main premises for purchased and homebred finishers (approximately 200 cattle). All cattle are housed during winter months when calving takes place. The suckler herd graze during summer months.

The beef business has been in the family since the 1960s. The suckler herd remains as 'closed' as possible keeping its own homebred heifers as replacements. The farm does however use purchased bulls in the herd. Approximately 60% of the purchased fatteners and finishers originate from the South West of England.

On 13/12/16, at a post-movement test, a reactor was positive to the skin test (with visible lesions at post-mortem). Genotype 11:a has been isolated, which matches the spoligotype isolated in the holding of birth. The reactor was born in Somerset - High Risk Area on 10/12/15. This premises currently has an OTFW incident at the beginning of November 2016 (genotype isolated is 11:a) and a previous OTFW breakdown in 2013 (isolating genotype 11:e). The reactor moved via Sedgemoor Market to a holding in Devon on 09/01/16. This farm has no history of TB breakdowns. The animal stayed at the Devon holding until 10/09/16 when it was purchased by the farmer through Sedgemoor Market on 10/9/16 and was moved directly to the barns at the premises until it was sent to slaughter on 16/12/16, staying only four months on the Essex holding. The reactor animal had two pre-movement skin tests with negative results prior to becoming a reactor (tested on 04/01/16 and at WHT on 15/08/16). The check test carried out in January had clear results.

The first short interval (SI) and interferon-gamma parallel tests carried out in March 2017 disclosed two inconclusive reactors and three gamma reactors with non-visible lesions at post-mortem (NVL). The second short interval test (SIT) in June was clear. The two inconclusive reactors disclosed in the first short interval test were privately slaughtered before the second short interval was completed (with non-visible lesions at post-mortem).

The two calves from these animals will be tested again 60 days from the removal of their inconclusive reactor dams from the farm (removed on 10/07/17). This holding will remain under restrictions until the cultures from the two inconclusive reactors are available and the two calves tested.
The origin of this breakdown has been assessed as purchased infected cattle.

A RAD zone has been established around this farm that includes nine holdings. To date radial test results have been negative. The next radial test for the zone (RAD6) is due in October 2017.

**West Sussex**

Arundel, West Sussex.

This farmer is running a large-size fattening herd, buying cattle from markets mostly and very rare directly from other farms. Purchased cattle is grouped on arrival and kept outdoors until the last two months when they are brought indoors for finishing. There is also a suckler herd of sixty cattle that was recently purchased in July 2016 from another farm. This herd was included in the breakdown testing.

On 22/9/16 this holding lost its OTF status due to a slaughterhouse case (DOB 10/02/2015). Disease was confirmed isolating genotype 11:a. This animal was previously tested clear at routine herd test (WHT) in March 2015 and 2016 at its farm of origin in Devon. This animal arrived on farm on 07/05/2016.

The check test carried out between October- December was clear. On 8/12/16 a second slaughterhouse case was identified (DOB 18/09/2014). The farm of origin was in Hampshire. This animal had a clear skin test at severe with negative gamma results at the herd of origin before moving to the premises. It was also tested clear at check test (CT) on another farm in November 2016. However, this slaughterhouse case was culture negative.

The first short interval test (SI) and IFN-γ parallel test completed on 27/2/17 disclosed four skin reactors, one inconclusive reactor and thirteen gamma reactor (all with non-visible lesions at post-mortem). The second short interval test (SI) and IFN-γ parallel test completed in June disclosed three skin reactors (with visible lesions at post-mortem) and nineteen gamma reactors (one with visible lesions and five with non-visible lesions at post-mortem). The next short interval test has been scheduled in October.

The holding of origin of the first reactor has a confirmed breakdown in June 2016 (genotype isolated 11:a). The origin of this breakdown has been assessed as purchased infected cattle.

Isle of Wight

Newport, Isle of Wight.

Medium- size pedigree Friesian Holstein milking herd and followers, approximately 450 cattle on farm. This holding also has a small purebred Hereford suckler herd of nineteen females and six bulls of varying ages. The dairy herd has all year round calving and spring calving for the suckler herd. The farmer tends to keep his own dairy heifers as replacements but sells in calf and bulling heifers to other farms. The beef calves are sold locally.

This holding became OTF herd status withdrawn due to a confirmed slaughterhouse case on 8/12/16 (genotype isolated 17:e). This animal was born in a holding in Dorset also with genotype 17:e isolated in 2011. Moved on to the premises on 25/11/10 and remained on farm until it was sent to slaughter on 8/12/16. On 9/1/17 a check test was completed disclosing five skin reactors (all with no visible lesions at post-mortem) and three inconclusive reactors, all eight animals were homebred.

The first short interval test and IFN-γ parallel test completed on 13/3/17 disclosed one skin reactor, four inconclusive reactors and 37 gamma reactors (none of them had visible lesions at post-mortem). The second short interval test carried out in June disclosed two reactors, two inconclusive reactors and one dangerous contact was also removed to slaughter (three had non-visible lesions at post-mortem).

The origin of this OTFW breakdown has been assessed as the purchase of an infected animal.
Radial testing zone has been established within 3km of this breakdown that includes twenty five holdings. To date radial test results have been negative. The next radial test for the zone (RAD6) is scheduled in November 2017.
Glossary

- **bTB** – (bovine) Tuberculosis (infection of cattle with *M. bovis*)
- **Edge Area (EA)** – the annual TB testing area of England situated between the High and Low Risk Areas
- **Epidemiology** – the science that studies the patterns, causes, and effects of health and disease conditions in defined populations
- **Genotype** – the genetic makeup of a cell, an organism, or an individual usually with reference to a specific characteristic under consideration
- **High Risk Area (HRA)** – the annual testing area of England comprising the South West, West Midlands and part of East Sussex, in which *M. bovis* infection is endemic in cattle herds and in badgers
- **IFN-γ** – interferon-gamma test. A supplementary in vitro blood test for TB used by APHA in conjunction with the tuberculin skin test in some situations, usually to improve the overall diagnostic sensitivity in infected herds with OTF status withdrawn
- **Low Risk Area (LRA)** – the four-yearly TB testing area of the North and East of England in which *M. bovis* infection occurs only sporadically in cattle and is not considered endemic in wildlife. Although the default testing interval for routine TB surveillance is four years, some higher risk herds in the LRA are subjected to annual testing. There is also more intensive surveillance testing (radial testing) around any herds in the LRA (and parts of the Edge Area) that have their officially TB free status withdrawn due to a TB breakdown
- **OTF** – Officially Tuberculosis Free status. Herds that are not subjected to TB movement restrictions of any type are classified as OTF
- **OTF-S** – Officially Tuberculosis Free Suspended status. In England, an OTFS breakdown is a herd in which all the reactors removed had no visible lesions (NVL) on post-mortem examination and had negative culture results for *M. bovis*
- **OTF-W** – Officially Tuberculosis Free Withdrawn status. In England, an OTFW breakdown is a herd in which at least one test reactor with visible lesions (VL) and/or an animal with *M. bovis*-positive culture result have been disclosed
- **Persistent herd breakdown** – a herd that has been under TB movement restrictions for 18 months or longer due to infection with *M. bovis*
- **Potential ‘Hotspots’** – a temporary area of enhanced TB cattle and wildlife surveillance that may be declared around some OTFW TB breakdowns of uncertain origin detected in a Region of historically low TB incidence
- **SIT** – short-interval test. A tuberculin skin test of all bovines in a TB breakdown herd, carried out 60 days after the removal of the last test reactor (or laboratory confirmation of a TB slaughterhouse case) in order to restore the OTF herd status. In the majority of cases, two successive SITs with negative results are necessary. The results can be read using standard or severe interpretation of the skin test. Calves under 42 days old are usually exempted.
- **VRA** – Veterinary Risk Assessment.

APHA is an Executive Agency of the Department for Environment, Food and Rural Affairs and also works on behalf of the Scottish Government, Welsh Government and Food Standards Agency to safeguard animal and plant health for the benefit of people, the environment and the economy.