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

Regional Office: South East Region

Mid-year (first six months) report for 2016

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 part of the Edge, the High Risk Area, or straddle both areas.
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 an 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) for the fattening of cattle operating in the LRA counties of the SE Region. The current units only accept, as a rule, cattle from OTF herds that have been subject to statutory pre-movement 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>2</td>
<td>109</td>
<td>29</td>
<td>17</td>
<td>9</td>
<td>4</td>
<td>3</td>
<td>173</td>
<td>75</td>
<td>32</td>
</tr>
<tr>
<td>CAMBRIDGESHIRE</td>
<td>1</td>
<td>197</td>
<td>53</td>
<td>39</td>
<td>20</td>
<td>9</td>
<td>8</td>
<td>327</td>
<td>86</td>
<td>27</td>
</tr>
<tr>
<td>ESSEX</td>
<td>0</td>
<td>291</td>
<td>56</td>
<td>30</td>
<td>22</td>
<td>9</td>
<td>7</td>
<td>415</td>
<td>65</td>
<td>19</td>
</tr>
<tr>
<td>ISLE OF WIGHT</td>
<td>0</td>
<td>87</td>
<td>22</td>
<td>29</td>
<td>7</td>
<td>7</td>
<td>1</td>
<td>153</td>
<td>82</td>
<td>37</td>
</tr>
<tr>
<td>HERTFORDSHIRE</td>
<td>3</td>
<td>152</td>
<td>28</td>
<td>21</td>
<td>13</td>
<td>3</td>
<td>2</td>
<td>222</td>
<td>58</td>
<td>21</td>
</tr>
<tr>
<td>KENT</td>
<td>12</td>
<td>404</td>
<td>104</td>
<td>64</td>
<td>44</td>
<td>27</td>
<td>14</td>
<td>669</td>
<td>88</td>
<td>29</td>
</tr>
<tr>
<td>GREATER LONDON</td>
<td>3</td>
<td>23</td>
<td>3</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>31</td>
<td>20</td>
<td>4</td>
</tr>
<tr>
<td>GREATER LONDON</td>
<td>0</td>
<td>28</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>33</td>
<td>33</td>
<td>10</td>
</tr>
<tr>
<td>NORFOLK</td>
<td>9</td>
<td>511</td>
<td>134</td>
<td>110</td>
<td>63</td>
<td>17</td>
<td>25</td>
<td>869</td>
<td>90</td>
<td>32</td>
</tr>
<tr>
<td>SUFFOLK</td>
<td>6</td>
<td>317</td>
<td>65</td>
<td>57</td>
<td>24</td>
<td>12</td>
<td>10</td>
<td>491</td>
<td>72</td>
<td>24</td>
</tr>
<tr>
<td>SURREY</td>
<td>6</td>
<td>208</td>
<td>32</td>
<td>32</td>
<td>22</td>
<td>11</td>
<td>11</td>
<td>322</td>
<td>87</td>
<td>21</td>
</tr>
<tr>
<td>WEST SUSSEX</td>
<td>11</td>
<td>255</td>
<td>55</td>
<td>71</td>
<td>37</td>
<td>20</td>
<td>20</td>
<td>469</td>
<td>107</td>
<td>39</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>9850 (75.7%)</td>
<td>2714 (20.9%)</td>
<td>448 (3.4%)</td>
<td>2 (0.0%)</td>
<td>13014</td>
</tr>
<tr>
<td>CAMBRIDGESHIRE</td>
<td>21734 (77.1%)</td>
<td>5307 (18.8%)</td>
<td>1142 (4.1%)</td>
<td>1 (0.0%)</td>
<td>28184</td>
</tr>
<tr>
<td>ESSEX</td>
<td>19310 (72.0%)</td>
<td>6256 (23.3%)</td>
<td>1255 (4.7%)</td>
<td>11 (0.0%)</td>
<td>26832</td>
</tr>
<tr>
<td>ISLE OF WIGHT</td>
<td>7966 (63.7%)</td>
<td>4267 (34.1%)</td>
<td>275 (2.2%)</td>
<td>2 (0.0%)</td>
<td>12510</td>
</tr>
<tr>
<td>HERTFORDSHIRE</td>
<td>10135 (78.6%)</td>
<td>2078 (16.1%)</td>
<td>678 (5.3%)</td>
<td>10 (0.1%)</td>
<td>12901</td>
</tr>
<tr>
<td>KENT</td>
<td>35350 (60.3%)</td>
<td>22081 (37.7%)</td>
<td>1142 (1.9%)</td>
<td>9 (0.0%)</td>
<td>58582</td>
</tr>
<tr>
<td>GREATER LONDON</td>
<td>466 (75.6%)</td>
<td>93 (15.1%)</td>
<td>56 (9.1%)</td>
<td>1 (0.2%)</td>
<td>616</td>
</tr>
<tr>
<td>GREATER LONDON</td>
<td>531 (49.3%)</td>
<td>490 (45.5%)</td>
<td>55 (5.1%)</td>
<td>0 (0.0%)</td>
<td>1076</td>
</tr>
<tr>
<td>NORFOLK</td>
<td>57988 (73.9%)</td>
<td>17101 (21.8%)</td>
<td>3344 (4.3%)</td>
<td>31 (0.0%)</td>
<td>78464</td>
</tr>
<tr>
<td>SUFFOLK</td>
<td>23859 (67.5%)</td>
<td>7795 (22.1%)</td>
<td>3672 (10.4%)</td>
<td>12 (0.0%)</td>
<td>35338</td>
</tr>
<tr>
<td>SURREY</td>
<td>15797 (56.4%)</td>
<td>11244 (40.1%)</td>
<td>970 (3.5%)</td>
<td>0 (0.0%)</td>
<td>28011</td>
</tr>
<tr>
<td>WEST SUSSEX</td>
<td>24110 (48.1%)</td>
<td>23607 (47.1%)</td>
<td>2404 (4.8%)</td>
<td>13 (0.0%)</td>
<td>50134</td>
</tr>
</tbody>
</table>
Density of cattle and cattle premises at the end of 2015

ZONE 1

Map - Cattle per square km

Map - Number of premises per 100 square km

Animal Density 2015
Cattle per km²:
- Less than 10
- 11 - 20
- 21 - 40
- 41 - 80
- Greater than 80

Premises Density 2015
Cattle Premises Density
- 0
- 1 - 20
- 21 - 50
- 51 - 100
- Greater than 100 (max. 120)

CREATOR: DSS GIS
Source: RADAR
Cattle/Premises Density

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TR397 (Rev. 07/15)
ZONE 3

Map - Cattle per square km

Animal Density 2015
Cattle per km²:
- Less than 10
- 11-29
- 30-49
- 50-69
- Greater than 69

Map - Number of premises per 100 square km

Premises Density 2015
Cattle Premises Density
Holdings per 100km²:
- 0
- 1-25
- 26-50
- 51-75
- 76-100
- Greater than 100 (max 126)
2. Geographical Distribution of Bovine TB Breakdowns in the Region

ZONE 1

Legend
- ▲ 2016 OTFW
- ▼ Pre 2016 OTFW
- ▲ OTFS 2016
- □ South East Zone 1

HOLDINGS/100km²
- 0
- 0 - 25
- 250 - 50
- 50 - 75
- 75 - 100
- 100 - 138

Norfolk
Suffolk

ZONE 2

Legend
- ▲ 2016 OTFW
- ▼ Pre 2016 OTFW
- ▲ OTFS 2016
- □ South East Zone 2

HOLDINGS/100km²
- 0
- 0 - 25
- 250 - 50
- 50 - 75
- 75 - 100
- 100 - 138

Cambridgeshire
Bedfordshire
Hertfordshire
Essex
Greater London

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Product No.: 26

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Ordnance Survey 100220115
Product No.: 29
3. Summary of the Regional Headline Cattle TB Statistics

There were five new OTFW breakdowns in first six months of 2016.

There were six OTFW breakdowns from 2015 which were concluded during the first six months of the reporting period. Two of the 2015 OTFW breakdowns were concluded in January; another two OTFW were resolved in February; the fifth OTFW was concluded in March and the last 2015 OTFW was concluded in May 2016.

There is one OTFW breakdown in Suffolk which was confirmed after data set extraction for the annual report was completed and it was concluded before the end of the reporting period. A case summary has been included at the end of this report.

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 2016 OTFW breakdowns in the LRA of the South East region are briefly summarised in Section 8 in this report. The enhanced 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) Total number of cattle herds live on Sam at the end of the reporting period</td>
<td>1455</td>
<td>1292</td>
<td>1528</td>
<td>162</td>
<td>4437</td>
</tr>
<tr>
<td>(b) Total number of cattle herds subject to annual TB testing at the end of the reporting period (any reason)</td>
<td>123</td>
<td>118</td>
<td>177</td>
<td>4</td>
<td>422</td>
</tr>
<tr>
<td>(c) Total number of herd tests carried out in the period</td>
<td>435</td>
<td>333</td>
<td>391</td>
<td>58</td>
<td>1217</td>
</tr>
<tr>
<td>(d) Total number of OTF cattle herds TB tested during the period for any reason</td>
<td>230</td>
<td>185</td>
<td>248</td>
<td>24</td>
<td>687</td>
</tr>
<tr>
<td>(e) Total number of OTF cattle herds at the end of the report period (i.e. herds not under any type of TB2 restrictions)</td>
<td>1449</td>
<td>1276</td>
<td>1504</td>
<td>161</td>
<td>4390</td>
</tr>
<tr>
<td>(f) Total number of cattle herds that were not under restrictions due to an ongoing TB breakdown at the end of the report period.</td>
<td>1451</td>
<td>1295</td>
<td>1518</td>
<td>162</td>
<td>4426</td>
</tr>
<tr>
<td>(g) Total number of new TB breakdowns detected in cattle herds during the report period</td>
<td>5</td>
<td>8</td>
<td>17</td>
<td>1</td>
<td>31</td>
</tr>
<tr>
<td>• OTF status suspended (OTFS)</td>
<td>4</td>
<td>7</td>
<td>14</td>
<td>1</td>
<td>26</td>
</tr>
<tr>
<td>• OTF status withdrawn (OTFW)</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>0</td>
<td>5</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>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>• could be considered secondary to a primary breakdown based on current evidence?</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>• were triggered by skin test reactors or 2xIRs at routine herd tests?</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>• were triggered by skin test reactors or 2xIRs at other TB test types (forward and back-tracings, contiguous, check tests, etc.)?</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>• were first detected through routine slaughterhouse TB surveillance?</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>(i) Number of new breakdowns revealed by enhanced TB surveillance (radial testing)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
conducted around those OTFW herds

<table>
<thead>
<tr>
<th></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>19265</td>
<td>15801</td>
<td>29818</td>
<td>587</td>
<td>65471</td>
</tr>
<tr>
<td>(b) Reactors detected:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• tuberculin skin test</td>
<td>10</td>
<td>55</td>
<td>34</td>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td>• additional IFN-gamma blood test reactors (skin-test negative or IR animals)</td>
<td>9</td>
<td>52</td>
<td>12</td>
<td>0</td>
<td>73</td>
</tr>
<tr>
<td>(c) Reactors per breakdown</td>
<td>3.16</td>
<td>13.375</td>
<td>2.70</td>
<td>1</td>
<td>5.5</td>
</tr>
<tr>
<td>(d) Reactors per 1000 animal tests</td>
<td>0.986</td>
<td>6.771</td>
<td>1.54</td>
<td>1.70</td>
<td>2.64</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>3</td>
<td>2</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>(f) SLH cases (tuberculous carcasses) reported by FSA</td>
<td>1</td>
<td>5</td>
<td>6</td>
<td>0</td>
<td>12</td>
</tr>
<tr>
<td>(g) SLH cases confirmed by culture of M. bovis</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>2</td>
</tr>
</tbody>
</table>
Density of skin test reactors, IFN-gamma test reactors and slaughterhouse cases in Officially TB Free Status Withdrawn (OTF-W) breakdowns per km² taken in the reporting period.

Density of skin test reactors, IFN-gamma test reactors and slaughterhouse cases in OTF-W and Officially TB Free Suspended (OTF-S) 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></td>
<td>3</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 investigation pending further testing results in the holding and radial zone (42/010/0001/02).

**Risk Matrix**

<table>
<thead>
<tr>
<th>Probability of introduced <em>M. bovis</em> infection introduced via cattle movements</th>
<th>Probability of isolated, sporadic ('one-off') breakdown, without secondary local spread from the index case</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Definite</td>
<td>Likely (no secondary breakdowns detected)</td>
<td>Possible (no secondary breakdowns detected, but dataset incomplete)</td>
</tr>
<tr>
<td>Likely</td>
<td>Not likely (secondary spread from the index case, or exposure to a common wildlife source has occurred)</td>
<td>Not likely (secondary spread from the index case, or exposure to a common wildlife source has occurred)</td>
</tr>
<tr>
<td>Possible</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Not likely (indigenous infection in the locality)</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

List the CPHs of those herds with OTFW breakdowns categorised as definite or likely introduced cases with no evidence of local spread (greyed-in boxes):

28/640/0165
01/075/0012
40/017/0203

5. Overview of the bTB Control Programme in the Region

- There have been no changes of skin testing from current 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 Local Authority to discuss TB Controls.

Overall results of radial bTB surveillance have been detailed in individual case summaries in section 8 of this report. There have been no exemptions from radial test granted during this reporting period.

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

7. **Other Susceptible Species**
There have been no reports of confirmed *M. bovis* infection from the South East Low Risk Area.

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.**

**Norfolk**

Small fattening farm, nineteen animals on holding. The enterprise is sustained by calves purchased from various markets and finishes and sends directly to slaughter.

The reactors [redacted], female LIM cross, born in Devonshire on 9/8/14 and moved on to [redacted] holding via [redacted] Auction Centre on 18/7/15. The animal was disclosed as reactor- with visible lesions at post-mortem inspection, during a trace test on 29/2/16. Genotype 11:a was isolated, matching the genotype of *M. bovis* isolated on farm of origin in Devon ([redacted]). Check test carried out on 21/3/16 revealed one skin reactor (with visible lesions at post-mortem and culture positive for *M. bovis*). On 20/6/16 the first short interval test and IFN-γ parallel test were clear. The second short interval test has been scheduled at the end of September.

Origin of this breakdown has been assessed as purchased origin.

Radial testing zone has been established within 3 km of this breakdown that includes twelve holdings. There has been one OTFS breakdown identified to date in the zone (one reactor, non-visible lesions at post-mortem and culture negative).

**Bedfordshire**

Dairy farm with 130 dairy and 200 fattening cattle. Beef/dairy offspring are reared on farm, some are sold to slaughter via [redacted] (farmer son’s holding) in Buckinghamshire ([redacted] Edge Area).

This holding became OTF herd status withdrawn due to a confirmed slaughterhouse case slaughtered at Dawn Meats abattoir on 12/01/16. This animal [redacted] was homebred and reared in Bedfordshire holding (visible lesions at post-mortem, culture positive on 09/03/2016, genotype 17:a isolated).

On 25/4/16 the first short Interval test and IFN-γ parallel test disclosed 46 skin reactors (26 with visible lesions and 20 with non-visible lesions at post-mortem), 5 inconclusive reactors and 56 IFN-γ test reactors (of which 35 were also skin test reactors, 6 with visible lesions and 16 with non-visible lesions at post-mortem).

Second short interval test completed on 11/7/16 disclosed 7 skin reactors (1 with visible lesions, 6 with non-visible lesions), one inconclusive reactor (IR) and 9 IFN-γ reactors (6 NVL).

Next short interval test (SI) and IFN-γ parallel test is scheduled at the end of September early October. The holding in Buckinghamshire also had spoligotype 17 isolated, genotyping is pending.
The source of infection has been linked to the purchase of infected cattle from the endemic bTB area of West Wales (traced animal). This traced animal became skin and gamma reactor at short interval test on 25/4/16 although it was previously tested clear during routine herd test on 8/4/2014. It was born in Wales ( ) on 27/07/10 and moved off the holding on 09/12/2010. This holding of birth became OTFW shortly after the animal moved off holding (genotypes 17:a and 17:x were isolated in the Wales holding). There were not samples taken at post-mortem for this trace animal therefore no genotype is available. However, the large number of reactors and explosive nature of this breakdown could be explained by the fact that this traced infected animal moved on to the Bedfordshire holding in 2011 and remained in the herd undetected until April 2016.

Radial testing zone has been established within 3 km of this breakdown that includes 26 holdings. There have been one OTFS breakdown (one reactor and six two-times inconclusive reactors, all with non-visible lesions at post-mortem, culture negative) and 17 inconclusive reactors disclosed in the zone to date.

Surrey

Medium size suckler herd with approximately 504 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.

The last routine herd test (RHT) was carried out in November 2015 disclosing four inconclusive reactors. At retest on 18/1/16 two of the inconclusive reactors became reactors (both with visible lesions at post-mortem and culture positive), genotype 13:a was isolated. Check test carried out on 15/2/16 revealed two skin reactors (one with visible lesions at post-mortem) and one inconclusive reactor. The first short interval test (SI) and IFN-γ parallel test completed in May revealed five skin reactors (3 had visible lesions and 2 had non-visible lesions at post-mortem) plus 15 gamma reactors (two with visible lesions and ten with non-visible lesions at post-mortem). The second short interval test (SI) and IFN-γ parallel test completed early August revealed one skin reactor (with non-visible lesions at post-mortem) and six gamma reactors. Next short interval test is scheduled in October.

, one of the purchased reactors came from an OTFS breakdown in East Sussex (4 7). Another three confirmed reactors have come originally from East Sussex holdings, homerange for genotype 13:a.

The origin of this OTFW breakdown has been assessed as purchased origin linked to movements on holding of infected cattle from homerange areas.

Radial testing zone has been established within 3km of this breakdown that includes twelve holdings. Radial testing has revealed one reactor (with non-visible lesions) and one inconclusive reactor to date.

West Sussex

This is a small fattening herd belonging to , but using the rented fields of . There are multiple locations used by various trading names. All cattle are mainly sourced from West Country, then fattened and sent directly to slaughter. The herd at - where disease was confirmed, is an organic herd where all the animals have been purchased directly from two organic farms in .

herd suffered and OTFW breakdown in 2014 triggered by a slaughterhouse case with a positive culture and a 9:f genotype alien to West or East Sussex (purchased origin). A radial testing zone was set up in 2014 with 12 holdings tested. A slaughterhouse case within this Rad zone was disclosed in 2016, but only after the herd had passed a clear Radial 6. This herd is now confirmed by positive culture result ( , see below).

In March 2016, during the 12-month check test of this herd, an animal was disclosed as a skin test reactor with visible lesions at post-mortem, isolating genotype 9:NT. The animal in question had been born in April 2014 at
Dorset (High Risk Area) and was purchased in November 2015, after a negative pre-movement test carried out on 13/10/2015. The holding of origin of this reactor was in Dorset and has an ongoing bTB incident, with the last OTFW breakdown in 2013 isolating spoligotype 9. The holding of origin of the reactor in Dorset is also contiguous to a 2016 OTFW breakdown.

The origin of this new breakdown is considered obscure at present. On the one hand, it seems that genotype 9:NT could be a mutant of genotype 9:f previously isolated during the 2014 TB breakdown on this farm, supporting the hypothesis that this could be a recrudescence of the previous TB breakdown. On the other hand, the herd owner operates an all-in-all out system, which makes difficult to maintain M. bovis on this farm. Furthermore, the index animal came from an area in which 9:f is endemic and it had only spent four months on the farm of destination in West Sussex before being identified as a test reactor, thus allowing a very short period in which it could have become infected on the destination farm (e.g. via environmental contamination or fomites). Both the first short interval and IFN-γ test on Stoke Farm have given negative results and this is all consistent with the theory that the animal was already infected on its arrival at West Sussex.

This breakdown triggered a radial zone back in 2014 and the testing in the zone was due to be completed by the end of 2016. However, the radial testing in the zone for this new 2016 breakdown has been reset in light of the new breakdown, although some of the cattle herds in this zone are already caught in the radial surveillance zone instigated around West Sussex.

This is a small-medium size dairy herd located in the radial surveillance zone of another OTFW breakdown at in West Sussex (see above).

The herd is divided in two locations keeping the main dairy unit with milking parlour located and the heifers and young stock kept. Previous confirmed incidents in this holding had genotype 11:a isolated after replacement cattle were purchased from Market back in 2002 and 2004. This holding hires bulls on a regular basis.

This latest breakdown was a confirmed slaughterhouse case, homebred which became culture positive on 1/4/16 isolating genotype 9:f. This animal was previously tested at routine herd test in 2013, also radial tested (RAD0) in 2015 with negative results and disclosed as an inconclusive reactor at six months radial test (RAD6) on 21/09/2016. This animal was tested clear at retest on 24/11/2015, but it became a slaughterhouse case when it was sent to the abattoir as cull cow. Check test of the rest of the herd carried out on 26/7/16 with negative results. The first short interval test (SI) and IFN-γ parallel test completed on 18/7/16 revealed one homebred skin reactor (with non-visible lesions at post-mortem) and 3 homebred IFN-γ test reactors (also with non-visible lesions at post-mortem). The second short interval test has been scheduled in October.

The origin of this breakdown is still under investigation pending further information from the next short interval test and testing results of contiguous herds.

Radial testing zone has been established within 3km of this breakdown that includes 22 holdings. There have been three inconclusive reactors disclosed in the zone to date.

8.1 Individual summary of ongoing breakdown from previous years still open at the end of the report period, grouped by county.

Norfolk

This holding is a small calf rearer with approximately seventy animals on holding. Calves are predominantly purchased from various sales and markets and reared on farm for re-saling as stores or replacements. Occasionally there are one or two animals that are being finish on farm and send directly to slaughter.
OTF herd status suspended due to a slaughterhouse case on 26/11/15. This animal was born and reared in Norfolk holdings before being moved to this final holding. *M. bovis* infection was confirmed on 19/01/16, isolating genotype 10:a.

Check test and IFN-γ parallel test carried out on 4/1/16 disclosed two skin reactors (one reactor which came originally from Warwickshire had non-visible lesions at post-mortem and the second reactor had visible lesions at post-mortem). The first short interval test (SI) and IFN-γ parallel test completed on 14/3/16 revealed one skin standard reactor (with non-visible lesions at post-mortem) and three gamma reactors (two with non-visible lesions at post-mortem). On 14/6/16 the second short interval test (SI) and IFN-γ parallel test revealed three gamma reactors (all with non-visible lesions at post-mortem). The last short interval carried out on 22/8/16 was clear.

Movements from high risk areas of infected cattle are considered to be the most likely source of infection in this breakdown since one of the reactors had lived in the homerange of genotype 10:a.

Radial testing zone has been established within 3 km of this breakdown that includes twenty two holdings. There has been one inconclusive reactor disclosed in the radial zone to date.

8.2 OTFW breakdown confirmed after data set extraction for the annual report was completed but concluded before the end of the reporting period.

**Suffolk**

Medium sized suckler herd, with approximately 108 South Devon cattle located at , where the herd have been established for the last 15 years. For management purposes the herd is split in half. Cattle are kept at all year round, except for the heifers that graze near . In March the steer calves and a few heifers are sold. Breeding bulls are purchased; the last three bulls moved on to the premises on 26/0/15.

was disclosed as reactor during a routine herd test t (RHT) on 15/12/15 (non-visible lesions at post-mortem, but culture positive with *M. bovis* genotype isolated 22:a). The reactor was born at on 4/2/07, and sold to via a market in Warwick on 2/5/09. The check test of the rest of this herd, carried out on 5/1/16, was negative. The first short Interval test and IFN-γ parallel test carried out on 15/3/16 disclosed four gamma reactors (all with non-visible lesions at post-mortem). Out of these four gamma reactors three were homebred whilst the fourth reactor was purchased. The purchased reactor ( ) was born in a holding in Dyfed ( , West Wales. This reactor went to the market in Northamptonshire ( ) in three occasions before being purchased by on 26/9/15. Northamptonshire had genotype isolated in one of its parishes. The second short interval test on 24/5/16 was clear. Restrictions were lifted on 2/6/16.

Origin of this breakdown is likely to be purchased origin since there have been a few movements on of purchased animals that have been resident in homerange areas of genotype 22:a (Southeast Wales).

Radial testing zone has been established within 3 km of this breakdown that includes eleven holdings disclosing one inconclusive reactor (IR) to date.
Glossary

- **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
- **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
- **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*
- **bTB** – (bovine) Tuberculosis (infection of cattle with *M. bovis*)
- **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.

The Animal and Plant Health Agency is an Executive Agency of the Department for Environment, Food and Rural Affairs working to safeguard animal and plant health for the benefit of people, the environment and the economy.