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

Regional Office:
Midlands: Lincolnshire

Mid-year (first six months) or Year-end report for 2015:
Year end 2015

1. Cattle Industry in the Region

The Lincolnshire cattle industry can be broken down (in order of significance) into 4 categories:

1. Finishing units – intensive and extensive
2. Beef suckler herds – pedigree and commercial
3. Dairy herds
4. Hobbyists

FINISHING UNITS

These form the most significant portion of the Lincolnshire cattle population in terms of cattle numbers. Most finishing units are managed intensively with a small proportion of units still operating a traditional extensive grass-based finishing system. A significant feature of the intensive finishing units in this, and other eastern counties, is that these units originally developed to cater for the need/opportunity to utilise both the products and the by-products of the Lincolnshire arable and vegetable units, and so the finishing enterprises have developed and grown as part of mixed arable/vegetable and cattle-finishing units.

Intensive units – Store cattle are primarily sourced from the stock-rearing areas of the Midlands, West of England, South-West of England and parts of Wales and moved to the Lincolnshire units for intensive finishing on arable/vegetable by-products. The main reason for the cross-country movement of cattle is that the county of Lincolnshire is not able to supply the number of cattle required by these finishers. This exemplifies the long-standing stratification of the British cattle industry, and thereby demonstrates the movement of the cattle to the feed, rather than movement of feed to the cattle.

These cattle are mainly sent direct to the abattoir on supermarket dead-weight contracts. Few will be sold through the live auction market system. These businesses rely on both the purchase and slaughter of large numbers of cattle on a weekly basis to ensure that supermarket/abattoir contracts for specific numbers of cattle at the specified weights and carcass classifications can be honoured. The intensive nature of these businesses means that the cattle are on farm for a length of time varying from a few weeks to 6 months.

There is significant industry concern that changes to the TB eradication programme may have a substantial impact upon the trading patterns of the intensive finishing units, especially those which are tied into contracts with the supermarkets. There is industry recognition that control is required, but there is a fear that those affected may not be made aware of changes at the earliest opportunity, and so may have very little time to make the necessary adjustments to business plans.

Extensive units – store cattle primarily sourced from own suckler herd and finished at grass. These finished cattle will be sold through the live auction market (Louth, Newark, possibly Melton Mowbray). Some may be sold deadweight.
**BEEF SUCKLER HERDS**

Pedigree herds – of some importance to this county, with pedigree stock (+/- semen and embryos) being traded both nationally and internationally. Herds will tend to have controlled/sporadic on–movements of cattle – mainly to source new bloodlines.

Commercial herds – replacements homebred or purchased. Cattle sold as stores through local markets as above or finished on farm for sale through live auction market or direct to slaughter.

**DAIRY HERDS**

Dairy herds (commercial and pedigree) are present throughout the county, tending to occur as isolated units rather than clustered in specific geographical areas. Most dairy herds are well-separated from other cattle herds by arable land.

**HOBBYISTS**

Small in number, but significant at times because of lack of owner awareness of TB risks (biosecurity), and occasional poor compliance with routine surveillance testing.

Usually beef sucklers (Dexter, Highland). Herds established for pet/ornamental/pasture control purposes. Buying and selling both privately and through live markets.

**Markets** – Louth Livestock Market, LN11 9HF

**Abattoirs** - 5

**LFUs** - 1

---

**Number of cattle premises by size band in the division at 1 January of the reporting year.**

<table>
<thead>
<tr>
<th>Cattle per premises</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>Number of premises</td>
<td>9</td>
<td>434</td>
<td>152</td>
<td>127</td>
<td>90</td>
<td>25</td>
<td>22</td>
<td>859</td>
<td>102</td>
<td>46</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th></th>
<th>Beef</th>
<th>Dairy</th>
<th>Dual purpose</th>
<th>Unknown</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of cattle</td>
<td>65176 (74.2%)</td>
<td>20893 (23.8%)</td>
<td>1811 (2.1%)</td>
<td>13 (0.0%)</td>
<td>87893</td>
</tr>
</tbody>
</table>
Density of cattle and cattle premises at 1 January of the reporting year.

**Cattle per square km**

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

* Introduced incidents are isolated cases definitely caused by introductions of infected cattle

Creator: IMT GIS
Source: Sam
OTFW data as at 2nd of March 2016
OTFS data as at 2nd of March 2016
CTS Density data at 31st of December 2015
Ref: 20150407_ML_27
### 3. Summary of the Regional Headline Cattle TB Statistics

Two OTFW breakdowns were carried over from the previous reporting year and were resolved before the end of the current reporting period. Three new OTFW breakdowns were disclosed in 2015, with two still ongoing at the end of the reporting period. All three new breakdowns were disclosed following routine FSA slaughterhouse surveillance. All three of the index cases were caused by introduction of infected cattle from higher incidence areas of the country.

#### Herd-level statistics

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Total number of cattle herds live on Sam at the end of the reporting period</td>
<td>972</td>
<td>965</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>50</td>
<td>33</td>
</tr>
<tr>
<td>(c) Total number of herd tests carried out in the period</td>
<td>658</td>
<td>705</td>
</tr>
<tr>
<td>(d) Total number of OTF cattle herds TB tested during the period for any reason</td>
<td>613</td>
<td>672</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>961</td>
<td>950</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>970</td>
<td>963</td>
</tr>
<tr>
<td>(g) Total number of new TB breakdowns detected in cattle herds during the report period</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>• OTF status suspended (OTFS)</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>• OTF status withdrawn (OTFW)</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>(h) Of the new OTFW herd breakdowns, how many:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• occurred in a holding affected by another OTFW breakdown in the previous three years?</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>• could be considered secondary to a primary breakdown based on current evidence?</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>2</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>0</td>
<td>0</td>
</tr>
<tr>
<td>• were first detected through routine slaughterhouse TB surveillance?</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>(i) Number of new breakdowns revealed by enhanced TB surveillance (radial testing) conducted around those OTFW herds</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>• OTFS</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>• OTFW</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>(j) Number of OTFW herds still open at the end of the period (including any ongoing OTFW breakdowns that began in a previous reporting period)</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>(k) New confirmed (positive <em>Mycobacterium bovis</em> culture) incidents in non-bovine species detected during the report period (indicate host species involved)</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
### Animal-level statistics (cattle)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Total number of cattle tested in the period (animal tests)</td>
<td>25802</td>
<td>15,813</td>
</tr>
<tr>
<td>(b) Reactors detected:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• tuberculin skin test</td>
<td>7</td>
<td>16</td>
</tr>
<tr>
<td>• additional IFN-gamma blood test reactors (skin-test negative or IR animals)</td>
<td>36</td>
<td>40</td>
</tr>
<tr>
<td>(c) Reactors per breakdown</td>
<td>5.38</td>
<td>7</td>
</tr>
<tr>
<td>(d) Reactors per 1000 animal tests</td>
<td>1.67</td>
<td>3.54</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>1</td>
</tr>
<tr>
<td>(f) SLH cases (tuberculous carcases) reported by FSA</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>(g) SLH cases confirmed by culture of M. bovis</td>
<td>3</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 (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></td>
<td></td>
</tr>
<tr>
<td>Other (explain)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Categorisation of all new OTFW TB breakdowns identified in the Midlands Region LRA using the following risk matrix, according to (a) the probability of them being the result of introduced infection (inward cattle movements) and (b) the strength of evidence that we are dealing with an isolated incident without further propagation from the index farm to neighbouring herds (or vice versa). The corresponding numbers of breakdowns have been entered in the relevant boxes. Any OTFW breakdowns falling in the greyed-in boxes may be removed from the county bTB incidence calculations for the purposes of EU reporting:

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

5. Overview of the bTB Control Programme in the Region

- No ad hoc background testing interval changes for specific herds or parishes
- One exemption applied to the deployment of the IFN-γ blood test
- Overall results of radial bTB surveillance - all radial tests clear at present. Testing ongoing.
- No unusual breakdowns
- No confirmed or suspected cases of zoonotic (human) *M. bovis* infection
- No suspected cases of non-specific and fraudulent skin test reactors
- No breakdowns involving producer-retailers and unpasteurised cheese-makers, open farms, etc
- Regular quarterly meetings are held with the NFU in both the East and the West of the Midlands Region. APHA have given specific support and encouragement to the Lincolnshire branch of the NFU in their drive to keep TB out of the LRA. Contact with OVs through OV newsletter, mailshots from the Regional mailbox or direct one-to-one contact in areas such as changes to TB policy, TB testing protocol. On-going audit programme of OVs for compliance with TB testing protocol.
- Quarterly meetings with local Trading Standards Departments with whom we work actively on TB enforcement. Contact on an as-needs basis re individual casework. Routine liaison with CCDC and PHE.
- No significant risks or issues concerning the delivery of TB control policies in the region.

6. Wildlife

No laboratory confirmed isolations of M. bovis in wild animals such as badgers, wild deer or wild boar carcases and no obvious evidence of indigenous reservoir of M. bovis infection in the local wildlife populations.

No voluntary badger BCG vaccination known to have taken place.

No evidence of ‘infection creep’ from the annual testing zone.

7. Other Susceptible Species

No evidence of TB (M. bovis infection) in any other animal species, including domestic non-bovine farm animals (camelids, goats, sheep, pigs), pets, zoo animal collections, captive (farmed/park) deer holdings and captive wild boar farms.

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

Carried over from 2014:

Market Rasen,

Large beef suckler and fattening herd - run from 5 main locations

Index case disclosed on 5/8/14 at SLH (VL broncho-mediastinal lymph nodes, culture positive) was purchased 24 months previously and kept housed since. The premises of origin (Derbyshire) had an OTFW breakdown (3 reactors, 1 VL) in January 2011 which ended May 2011, after the index case was born.

Genotype is 25:a which is within the homer range of the premises of origin

Imported case, excluded from the 2016 calculation

Breakdown testing is complete with 54 (4 skin test, 50 gamma test) reactors all NVL.

Radial testing is complete, with 4 skin tests completed so far out of 4 eligible herds; no reactors to date.

TB10 date: 7/5/2015

6MT completed clear.

Boston, Lincolnshire

Beef suckler herd.

Index case disclosed on 18/9/14 at SLH (VL broncho-mediastinal lymph nodes, culture positive) was a homebred animal.

Genotype is 25:b, only one other case confirmed ever in Lincolnshire in 2010, no relation to this farm.
Very few purchases, all have come from clear premises in LRA; all bought in stock have come either through Louth Market (LRA) or Newark Market (Edge Area). One tenuous link to a confirmed (25:a) Cheshire breakdown (singleton reactor) which sold approx 8 cattle to another Lincs holding, which subsequently sold 2 own-bred cattle to the Lincs b/down case. The two groups of cattle never had direct contact, and the traced cattle tested clear and those still alive continue to test clear in 2016.

Origin of infection remains obscure, not excluded from the 2016 calculation.

Breakdown testing is complete; no reactors found.

Parallel interferon gamma test completed and negative.

Radial testing is complete, with 3 tests completed out of 3 eligible herds; no reactors to date.

TB10 date: 19/5/2015

6MT completed clear

**Breakdowns disclosed 2015:**

**Boston Lincolnshire**

Beef suckler herd and fattening unit with several discrete premises with CTS links to the main CPH. Cattle for the fattening unit are purchased from Louth (LRA), Melton, Newark (Edge Area), Bakewell and Cirencester Markets (HRA), but occasionally also from local farms.

Index case disclosed on 16/2/15 at SLH (VL broncho-mediastinal lymph nodes, culture positive, Genotype is 25:a)

Index case came in June 2014 from a herd in Staffordshire (High Risk Area, 25:a is endemic) which previously had clear CON test (due to genotype 25:a).

Imported case, excluded from the 2016 calculation

Breakdown testing is complete; no skin reactors and 3 IRs to date, IRs were privately slaughtered, NVL.

Parallel interferon gamma test disclosed 6 reactors, all NVL.

Radial testing still active, with 11 eligible herds; no reactors to date.

TB10 date: 6/7/2015

6MT completed clear

**Lincolnshire**

Beef suckler herd and fattening unit with CTS links to the main CPH. Most of the fattening stock comes from market (HRA)

Index case disclosed on 20/05/15 at SLH (VL retro-pharyngeal lymph nodes, culture positive, Genotype: 9:c)

SLH case purchased 12 months prior to disclosure from Dorset holding which had 2 resolving IRs immediately prior to selling this clear-testing animal. The IRs were both purchased - one from place of birth in Somerset 36/022/0167 which was regularly OTFS but is OTFW for first time in Feb 2016 - no genotype yet. Other IR from a Somerset clear testing holding but had been born on a Devon holding which has had 9:a and 11:a breakdowns (in 2006 and 2011 respectively). 9:c is not native to any of the above mentioned counties. Genotype for OTFW b/down may help to rule this in or out.

gIFN reactor in Lincs b/down came from a Wiltshire herd which has had both 9:d (2014) and 17:a (2012). However the Lincs b/down holding does purchase finishing cattle from several HRA herds, some cattle having moved several times in their life before arriving at the Lincs holding. It is likely therefore that this infection was either introduced by the index case itself or via another purchased but undisclosed animal.

Imported case, excluded from the 2016 calculation.

First CT has been clear, breakdown testing has disclosed no skin reactors to date, but parallel interferon gamma has disclosed 19 positive animals, one of them was VL (no culture).

Radial testing still active, with 4 eligible herds.
and had 5 SLH cases with 4 confirmed breakdowns. The whole unit is surrounded by arable land, no badgers or deer in the local area.

Index case: 20 months old heifer was bought in on 24/4/15, VL (Broncho-mediastinal) on 8/10/15, Culture positive, Genotype 9:f
Animal had been traced back after confirmed breakdown at farm of origin (Dorset- HRA, genotype of origin breakdown 9:f) and sent to slaughter
Imported case, excluded from the 2016 calculation

IFN- gamma parallel test limited to the cohort group, completed on 8 animals including skin test, clear.
Pending completion of first SIT (skin test) on rest of the herd.

RAD test not instigated (no other cattle in RAD area)

**Summary map of RAD tests in Lincolnshire**
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.