Animal & Plant Health Agency

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

Regional Office:

Yorkshire, comprising North Yorkshire (48 and 50) / West Yorkshire (49) / South Yorkshire (47) and Humberside (51)

Mid-year report for 2018:

Report from 1 January until 30 June 2018.

1. Cattle Industry in the Region

The Yorkshire cattle industry is large and diverse, with 50% of registered herds being beef rearing and finishing herds, 33% being beef breeding herds and the remainder being dairy herds. Bovine tuberculosis (bTB) is found predominantly in beef fattening/finishing units which abound, taking advantage of abundant co-products from the low ground arable sector. To maintain throughput, some of these herds source animals fairly indiscriminately from multiple sources, many from the endemic bTB areas in the West and South West of England / Wales. Very large units (1000+) are becoming more common. By contrast, in some areas of North and West Yorkshire, a high density of smaller herds can still be found.

Most breeding replacement movements take place via local routes, with some imports from other countries. Buyers are generally well aware of the bTB risk. Beef cattle buying follows the general English pattern of West / South West England and Wales to East / North East England. Market movements are frequent and this is further facilitated by dealers who buy from holdings and markets in the West / South West and facilitate supply to finishers in the North and East. The larger beef finishing units, often permanently housed and committed to supply contracts with beef processors, will prioritise semi-continual availability of cattle in their preferred specification over perceived bTB disease risk.

Currently there are fifteen Licensed Finishing Units (LFU) in the region for fattening of cattle from OTF premises under biosecure conditions. We have had enquiries from other farmers in the region to set up other similar units, which we are currently assessing.

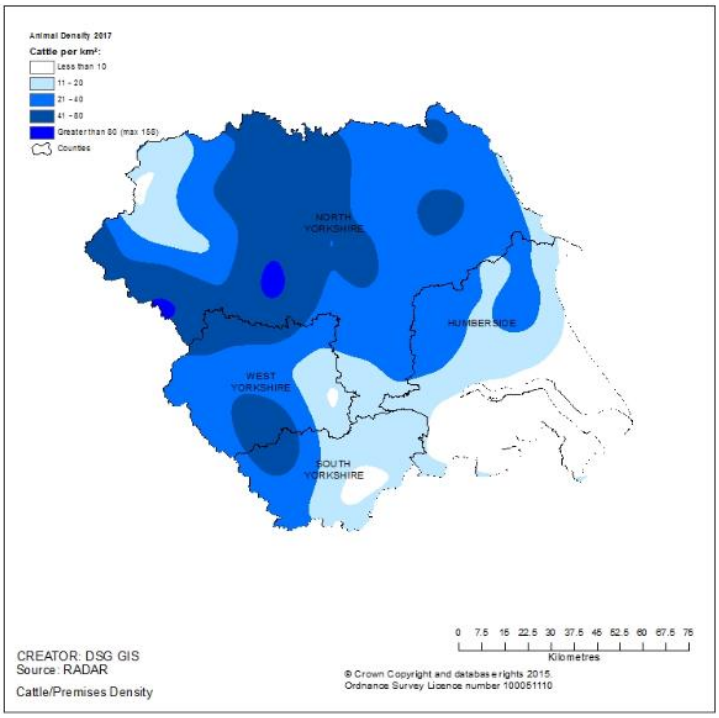
Number of cattle premises by size band in the division at 1 January of the reporting year.

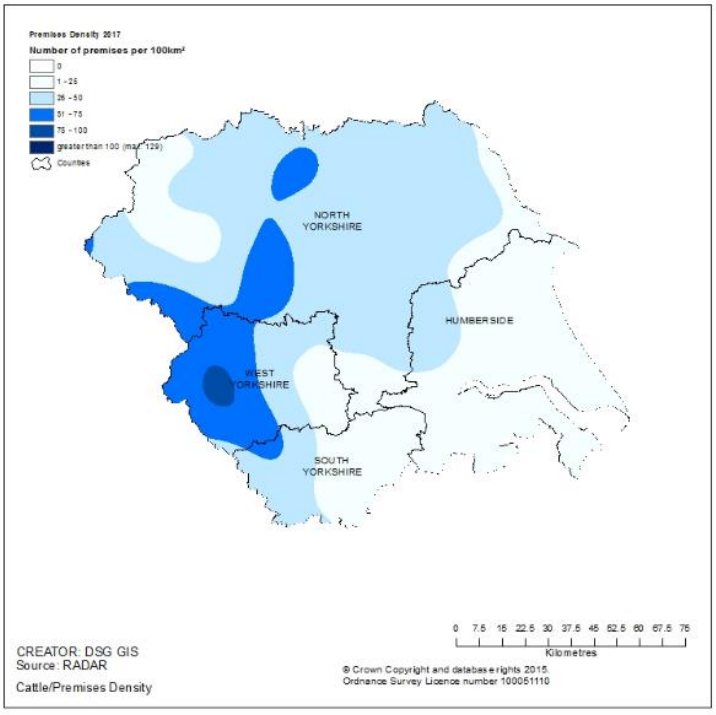
Cattle per premises	0	1 - 50	51 - 100	101 - 200	201 - 350	351 - 500	501+	All	Mean	Median
South Yorkshire 47	3	217	89	64	33	11	7	424	85	44
North Yorkshire 48	30	1346	580	562	325	111	101	3055	118	61
West Yorkshire 49	5	685	160	102	56	17	11	1036	64	25
East Yorkshire 50	3	102	35	20	15	7	6	188	93	42
Humberside 51	10	364	130	118	55	16	11	704	85	45

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

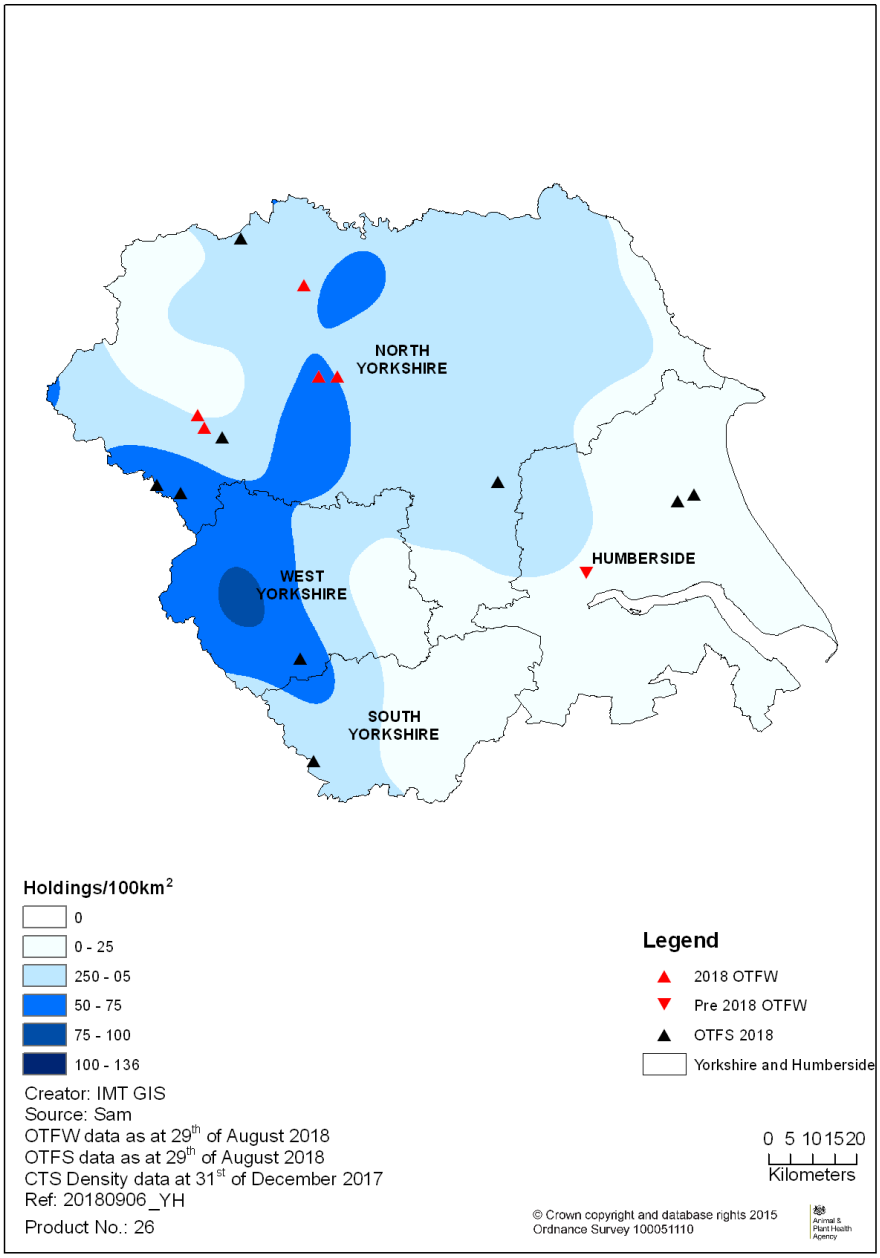
	Beef	Dairy	Dual purpose	Unknown	Total
South Yorkshire 47	23770 (65.7%)	10874 (30.1%)	1539 (4.3%)	1 (0.0%)	36184
North Yorkshire 48	214672(59.7%)	136587(38.0%)	8502 (2.4%)	42 (0.0%)	359803
West Yorkshire 49	42674 (64.0%)	20750 (31.1%)	3238 (4.9%)	20 (0.0%)	66682
East Yorkshire 50	12013 (68.9%)	4927 (28.3%)	492 (2.8%)	1 (0.0%)	17433
Humberside 51	45986 (76.8%)	12320 (20.6%)	1534 (2.6%)	3 (0.0%)	59843

Density of cattle and cattle premises at 1 January of the reporting year.





2. Geographical Distribution of Bovine TB Breakdowns in the Region



3. Summary of the Regional Headline Cattle TB Statistics

Yorkshire has a relatively small number of bTB incidents. Eradication of infection from these has so far been relatively easily achieved, by application of standard testing regimes. The majority result from direct movement of infected beef fattening animals from endemic bTB areas. There are a small but significant subset of cases that have resulted from movement of infected animals between herds within the region prior to their detection. There is currently no convincing evidence of wildlife infection.

From 1st January 2018 until 30th of June 2018 there were 14 new herd incidents of which five had animals with TB lesions or culture-positive results (OTF status withdrawn). This compares with the 31 new TB herds incidents in 2017 of which 6 were confirmed. In comparison there were 7 OTFW cases in 2016 and 15 in 2015 in this region. Eight more cases that had started in 2017 ended in the first half of 2018. Three of them were confirmed and one of them was still ongoing as at 30th of June 2018.

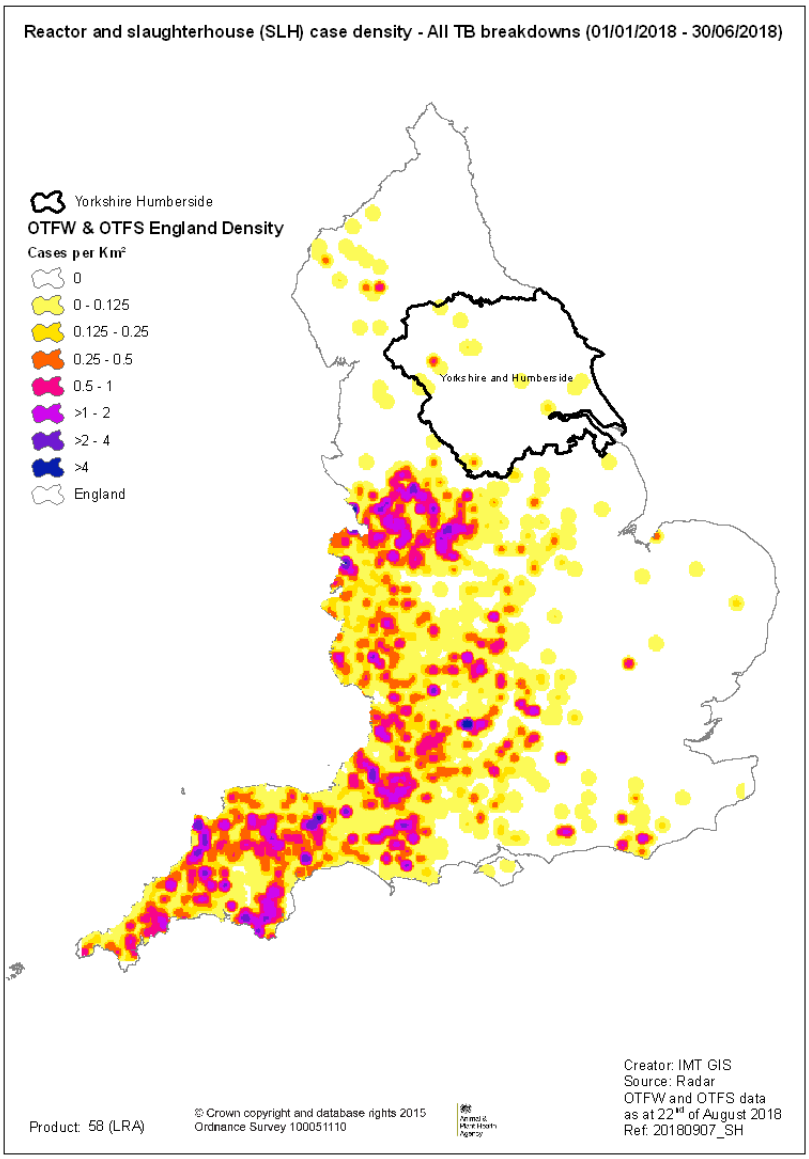
Radial surveillance testing was not undertaken around one of the new OTFW incidents, based on a favourable veterinary risk assessment (VRA). To date no additional incidents have been revealed in the three radial surveillance zones instigated so far in this region.

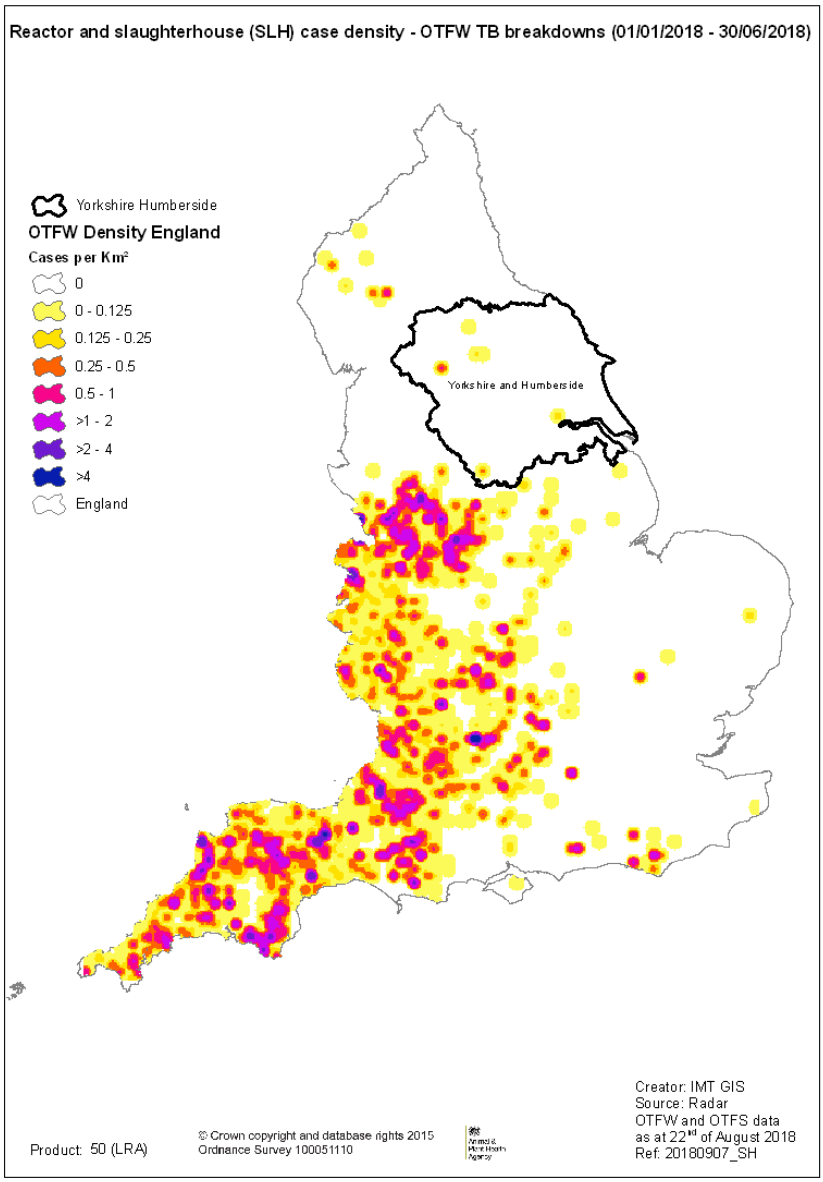
More details of the five OTFW incidents detected in the reporting period can be found in the case reviews in section 8.

Herd-level statistics	**South Yorkshire 47**	**North Yorkshire 48+50**	**West Yorkshire 49**	**Humberside /East Yorkshire 51**
(a) *Total number of cattle herds live on Sam at the end of the reporting period*	504	3781	1232	851
(b) *Total number of cattle herds subject to annual TB testing at the end of the reporting period (any reason)*	67	235	30	58
(c) *Total number of herd tests carried out in the period*	183	884	188	225
(d) *Total number of OTF cattle herds TB tested during the period for any reason*	87	559	167	133
(e) *Total number of OTF cattle herds at the end of the report period (i.e. herds not under any type of TB2 restrictions)*	488	3745	1219	842
(f) *Total number of cattle herds that were not under restrictions due to an ongoing TB breakdown at the end of the report period.*	498	3760	1232	848
(g) *Total number of new TB breakdowns detected in cattle herds during the report period*	1	10	1	2
• *OTF status suspended (OTFS)*	1	5	1	2
• *OTF status withdrawn (OTFW)*	0	5	0	0
(h) Of the new OTFW herd breakdowns, how many:				
• occurred in a holding affected by another OTFW breakdown in the previous three years?	0	0	0	0
• could be considered secondary to a primary breakdown based on current evidence?	0	0	0	0
• were triggered by skin test reactors or 2xIRs at routine herd tests?	0	0	0	0
• were triggered by skin test reactors or 2xIRs at other TB test types (forward and back-tracings, contiguous, check tests, post-movement, etc.)?	0	0	0	0
• were first detected through routine slaughterhouse TB surveillance?	1	0	0	0
(i) Number of new breakdowns revealed by enhanced TB surveillance (radial testing) conducted around those OTFW herds	0	2	0	0
• OTFS	0	2	0	0
• OTFW	0	0	0	0
(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)*	0	4	0	1
(k) New confirmed (positive *Mycobacterium. bovis* culture) incidents in non-bovine species detected during the report period (indicate host species involved)	0	0	0	0

Animal-level statistics (cattle)				
(a) *Total number of cattle tested in the period (animal tests)*	6378	53223	7585	9169
(b) *Reactors detected:*	10	34	2	10
• *tuberculin skin test*	0	18	2	3
• *additional IFN-gamma blood test reactors (skin-test negative or IR animals)*	10	16	0	7
(c) *Reactors per breakdown*	10	3	2	5
(d) *Reactors per 1000 animal tests*	1.57	0.64	0.26	1.09
(e) *Additional animals identified for slaughter for TB control reasons (DCs, including any first-time IRs)*	0	0	0	0
(f) *SLH cases (tuberculous carcases) reported by FSA*	0	8	0	0
(g) *SLH cases confirmed by culture of M. bovis*	0	3	0	0

Density of TB reactors and slaughterhouse cases in TB breakdowns per km²





4. Suspected Sources of *M. bovis* Infection for all the New OTFW Breakdowns Identified in the Report Period

Most likely origin	Provisional	Final
Introduction (e.g. purchase) of infected animal(s)	2	3
Local - lateral spread from neighbouring holdings:	0	0
• exposure to infected wildlife e.g. badgers	0	0
• other farmed species	0	0
• recrudescence of residual infection from a previous TB breakdown	0	0
• infected human source	0	0
Undetermined/obscure	0	0
Other (explain)	0	0

		Probability of isolated, sporadic ('one-off') breakdown, without secondary local spread from the index case		
		Likely (no secondary breakdowns detected)	**Possible (no secondary breakdowns detected, but dataset incomplete)**	**Not likely (secondary spread from the index case, or exposure to a common wildlife source has occurred)**
Probability of introduced *M. bovis* infection introduced via cattle movements	**Definite**	2	0	0
	Likely	1	0	0
	Possible	2	0	0
	Not likely (indigenous infection in the locality)	0	0	

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

5. Overview of the bTB Control Programme in the Region

Background four-yearly routine surveillance testing across the region.

- Enhanced bTB herd surveillance (radial testing) instigated for all OTFW breakdowns by default, with any exemptions subject to VRA by the case Veterinary Officer.
- Three exemptions were granted from radial surveillance within the reporting period. Licensed Finishing Units have been encouraged so that slaughterhouse cases from those units will not generate radial surveillance or enhanced testing of neighbouring herds.
- Pre-movement testing requirements (supplemented by post-movement testing from April 2016) have not been a major issue, as far as we are aware, in the region.
- No interferon-gamma testing exemptions applied for in any of the OTFW breakdown herds.
- TB in other species: see Section 7 below.
- No confirmed or suspected cases of zoonotic (human) *M. bovis* infection.
- No suspected cases of non-specific or fraudulent skin test reactors.
- No bTB breakdowns involving producer-retailers and unpasteurised cheese-makers or open farms during the reporting period.
- The first meeting of the TB Eradication Group for the Yorkshire area took place on Thursday 9th November at the York NFU office. Key stakeholders were involved and the general opinion was that it was a useful meeting. Further meetings will be organised as the perceived need indicates which will be driven by local issues and national policy development.

6. Wildlife

No confirmed *M. bovis* infection has been detected in wildlife in the area.

7. Other Susceptible Species

None to date.

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 North Yorkshire

8.1.1 Keighley, North Yorkshire, BD (new case in 2017)

This is a family run dairy herd comprising 195 cattle and approximately 20 calves. It has been a closed herd since 2013. Cattle are grazing during spring and summer in the fields surrounding the main premises and they are housed during winter. This was the first TB breakdown in this particular premises. The OTF status was withdrawn following the disclosure of four homebred reactors (all twice IRs) with two of them presenting with visible lesions at PM examination. Reactors were revealed during a CT-LRA-SA on the 10/07/2017 that the farmer was advised by his PVS to perform before selling calves through a dispersal market. The culture results were reported with a big delay on the 13/12/2017 and both reactors were culture negative (another type of bacteria was detected but not acid fast).

The first SIT at severe was completed on the 19/09/2017 and disclosed 2 IRs. The parallel IFN-γ revealed 35 reactors (including one of the IRs). All 35 reactor animals were homebred and NVL on post mortem meat inspection. The second SIT at severe was carried out on the 27/11/2017, disclosing one NVL Rractor. The third SIT was completed with negative results on 12/2/18 and therefore the restrictions were lifted on 19/2/18. The 6M test completed in the holding on 28/08/2018 with negative results.

The last time the farmer bought in cattle was on 14/09/2013. In particular, two animals were brought in from another farm in North Yorkshire. This holding of origin had recently (in November 2017) completed a clear radial testing regime and has not had any TB breakdown in the past. In addition, all Pre-Movement test have been clear. According to the movement records, the purchased animal during its residential period in holding (from 02/11/2006 until 14/09/2013) has been several times in animal gatherings (shows). This animal had only been tested twice with clear results; once on the 05/02/2013 while in a holding and most recently in holding on 28/01/2014 and was slaughtered on the 15/09/2015.

Considering the above, the most possible source of introduction of the disease within the herd could be due to the purchase of an infected animal (or animals).

The 3km Radial zone has been triggered due to this being a confirmed incident. 65 holdings are currently subject to the radial testing regime. At the point of writing, two OTFS incidents were disclosed due to the disclosure of NVL and culture-negative reactors at this point.

8.1.2 Skipton, North Yorkshire BD (new case in 2017)

This holding operates as a Licenced Finishing Unit (LFU) with the capacity of approximately 250 cattle. A 2 year-old male animal was purchased on the farm on 8/8/17 and sent for slaughter on 7/9/17. This was reported as a slaughterhouse case that subsequently was culture positive with genotype 12:a confirmed. The animal, before being introduced to LFU, had been on two holdings, both located in the LRA. Last holding had a clear Check Test on 21/11/2017. None of the previous holdings have had a TB incident in the past.

No further TB testing and Radial testing is required at this stage, as this is an LFU.

As this is an LFU it is most likely that the disease was introduced into the unit from a purchased infected animal, although it has not been confirmed that this particular young bull was the actual source of the infection.

8.1.3 Ripon, North Yorkshire, HG

The farm, is a small pedigree suckler herd of less than 20 cattle. Calves produced on farm are sold privately, directly from the farm. The farm comprises some buildings (pens consisting of three solid walls and a front fence) and some paddocks around them, with approximate 15 acres of land. Cattle are housed during the winter (November to April) and grazing during the summer (paddock grazing). Calving takes place usually at spring.

Five reactors were identified during a RHT on 16/04/18. Three of them were disclosed as VL. Positive culture was obtained. Genotype available for one of the animals has been confirmed as 10:a. In addition to the reactors, some animals were also slaughtered as direct contacts and they were NVL on post mortem meat inspection.

Regarding TB testing and history for the holdings where all the positive cattle have been previously:
-Holding where the UK animal has been in the past, was OTFS in June 2018.

-Holding from which another animal originated, has undergone several contiguous tests since 2013.
– 2 Holdings where an animal had been for a short period, have had a check test with negative results in 2015 due to a confirmed slaughterhouse case in the vicinity (genotype 11:a). Also another holding has been under Radial testing regime since 2015 due to another confirmed incident in the area (genotype 17:a). None of the above holdings have had a confirmed TB incident.

A clear check test for all animals that were not tested in the RHT was completed on 23/4/18. The mandatory interferon gamma parallel test was completed on 23/5/18 with negative results.

To date the first SIT was completed on 3/7/18 and was negative. Second SIT is due for 02/10/2018. At present the origin of this incident has been assessed as obscure.

8.1.4 Ripon, North Yorkshire HG

This holding operates as a Licenced Finishing Unit. On 8/1/18 one male animal was found to have visible lesions at the slaughterhouse. Culture was positive and genotype 25:b identified.

This particular animal had been on two holdings prior the LFU, both of which located in the homerange of (and had TB breakdowns with) genotype 25:a in 2015 and 2017. Therefore, the source of infection for this particular incident has been assessed as the purchase of the animal from the HRA.

Due to the fact that this is an LFU, additional TB testing and radial testing have not been instigated.

8.1.5 Skipton, North Yorkshire, BD

This is a dairy herd of 200 cattle. They breed their own replacements and use mainly AI. They occasionally buy in from other farms in the LRA a dairy bull and cow or heifer for genetic improvement.

On 13/3/18 a slaughterhouse case was identified. This animal was homebred. Culture results were positive for *M. bovis* of genotype 25:a.

Last bull purchased on the 20/11/17. This holding has no history of TB and last RHT completed on 23/11/15.

Regarding previous TB history for this farm: on 8/7/14 three cattle were tested as 2xIRs. All reactors were homebred heifers within the same epidemiological group and were born on December 2012. All three were NVL at slaughter and culture negative. Short-interval testing identified no more reactors. The current slaughterhouse case was also born in 2012 but in July. According to the owner due to difference in age, she was probably not reared in the same epidemiological group as the previous reactors. However, she will have been in similar locations on the premises. This holding had been under a radial testing regime in 2015 and 2016, due to an OTFW incident on a neighbouring farm – culture was negative). This particular premises have had a clear radial test on 15/05/2018.

Large numbers of spread tracings are required due to the partial dispersal sale in October 2017 of approximately 200 breeding cattle. At present there are no reports of any reactor animal, but all tests have not been completed yet.

The first SIT and interferon-gamma tests were undertaken on 21/5/2018. One TB skin, NVL reactor and 16 IFN-gamma test positive animals (all NVL) were disclosed.

The origin of this breakdown remains obscure.

Radial testing within the 3km radial zone has revealed another OTFW incident with negative culture results at, Farm below.

8.1.6 Skipton, North Yorkshire, BD

The main business is a beef suckler herd comprising approximately 90 cattle. They are managed as three separate herds of 31, 21, 20 cows mainly by breed type; 2 Blue/Grey groups (A&C) and 1 Angus group (B). The herds A&C are generally grazed very extensively and not closely supervised. Calves are weaned at the end of December and sold March/April as stores usually through an agent. The best animals are sold as stores through Skipton market.

Record keeping is limited especially the recording of deaths. Actual numbers of stock are only checked at TB testing or rounding up cattle to move them.

Mr Carlisle does contract work locally, mainly tractor work cutting silage and baleing. He does tractor work for an OTFW case on another Farm.

A radial test that was triggered from the above confirmed incident, (8.1.5; Farm) was completed on 23/5/18 disclosing three reactors. One of the cattle was VL at post-mortem meat inspection. The other two cattle were NVL and both homebred.

The one animal was purchased from the LRA in 2014. No live calves born to this cow. Clear skin test completed on 9/12/14, 12/5/16 & 17/6/16. Herd of birth appears to be no longer active.

Restrictions were served on 26/5/18.

CTS discrepancies have been identified. SITs have not been completed yet.

Origin of infection at this point is obscure - genotype for comparison with the TB confirmed incident, (25:a) awaited.

8.1.7 Richmond, North Yorkshire DL

On 5/6/18 a slaughterhouse case was revealed. The animal was born in Northern Ireland on 31/03/2016 and imported to a farm in the south of Scotland on 06/04/17. After 14 months it was sold at Applegarth Mart before arriving at Manor house on 09/08/2017.

The first part of the SIT in August 2018 revealed 4 NVL reactors and 1 IR. These four animals were all born in April-May 2017 and had each originated from separate cattle farms in the LRA (three in Cumbria and one in Northumberland), none of which has a history of TB incidents.

Interferon-gamma testing on 20th and 22nd of August 2018 revealed seven more reactors, six NVL and one VL.

The gamma positive VL animal was born on another farm on 07/06/17 and sold via market to this farm on 26/04/2018. On 03/09/18 it was sent to the slaughterhouse and killed the following day. The animal had been tested clear twice at farm of origin. Thompson House farm has never had a TB incident.

Three of the other gamma positive cattle had been tested historically with clear results and the other 3 had no testing history.

The culture of the slaughterhouse case came back positive with spoligotype 9. This spoligotype is widespread in West Wales and the west of England. Genotyping is still pending and probably will provide more details for the origin of the infection. The culture results for the gamma positive VL animal is still pending. Up to now spoligotype 9 has been only once reported in North Yorkshire (9:b) andit has been recorded also in four cases (9:d) in Dumfriesshire (Southern Scotland). Several isolated cases have also been recorded with this spoligotype in Cumbria, a county not far from the farm of origin of the slaughterhouse case in Scotland.

The source of disease is considered most likely to have come from a purchased animal.

8.2 West Yorkshire

No new cases so far this year.

8.3 South Yorkshire

8.3.1 Sheffield, South Yorkshire, S6 (new case in 2017)

This is a suckler/ finishing herd which had a slaughterhouse case on 19/9/17. The animal was bought as a calf in February 2016. This herd has a clear testing history with the last test (before the slaughterhouse case) in this herd being a RAD12 in 2015.

The herd of origin has a clear testing history

Restrictions were served on 20/9/17.

The slaughterhouse case was culture positive for *M. bovis* and the isolate was of genotype 65:a. This is an unusual genotype rarely seen. There were no reports of this spoligotype in 2016 and one in Oxfordshire in 2015. The source of the infection remains unclear. The original farm that triggered the radial surveillance had spoligotype 25:a.

Most animals are bought from the LRA and of those that were not sourced from the LRA the farms or origin have clear testing histories except for one that has had spoligotype 25:a in 2012 and again in 2018.

The CT, first SIT and second SIT were all clear (severe reading), including an in-house test (2nd SIT done by VO). The interferon gamma tests resulted in 7 positives at first sampling and 4 positives out of 8 re-samples out of 123 animals (equating to nearly 10% gamma positive). All positive gamma animals were slaughtered and were NVL. No further cultures were requested from these animals. The third SIT completed with clear results and restrictions were therefore lifted on the 05/06/2018.

8.4 Humberside/East Yorkshire

8.4.1 Brough, East Yorkshire HU (new case in 2017)

This is a cattle grower/fattening herd, cattle are kept always indoors in non-wildlife-proof buildings. On 21/11/17 a slaughterhouse case was revealed and restrictions were served on 24/11/17.

The farmer buys in calves – originally from the HRA – but recently from the LRA, and fattens them until they are ready for slaughter. He sells through dedicated slaughter markets (so called red markets) only.

The 1st SIT was conducted on 05/02/2018 in conjunction with an interferon-gamma parallel test. It revealed one skin reactor, which was also gamma reactor. Animal was slaughtered and a positive culture result was received on 12/04/2018, genotype 25:a.

The 2nd SIT and gamma test was done on 8/5/2018. Skin test clear but 7 NVL gamma reactors were disclosed.

The 3rd SIT completed on 24/7/2018 with clear results, and restrictions were lifted on 10/08/2018.

All affected animals were purchased. The slaughterhouse case culture result yielded genotype 25a – this is the same genotype as disclosed at the farm of origin; thus origin of this infection is considered to be purchased infected cattle.

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.