

bTB Epidemiology Report

3 [redacted]

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1. Executive Summary

- a) On the 18th and 19th of April 2017, during a routine herd test, 8 Reactors and 4 Inconclusive Reactors were disclosed at CPH [redacted].. This is a mixed stock farm situated in [redacted], Skye. Because of the location and the high number of Reactors at disclosing test, the case assumed since the beginning unusual connotations.

On 7/5/2017 Visible Lesions were found at Post Mortem Examination and the status of the farm was changed to Officially Tuberculosis Free Withdrawn (OTFW). Up to now, following Check Test and Gamma sampling, and a first Short Interval Test, 21 animals have been removed and 2 further Short Interval tests are required. All samples from initial reactors were cultured and HAIN PCR was done, but all results were negative.

Table 1 – Significant events prior to and following disclosure of bTB

<u>Date</u>	<u>Event</u>
19/3/2013	Last clear Routine Heard Test (RHT48), 53 of 103 animals tested
21/11/2014	4 bulls bought from [redacted]. [redacted] will become reactor following the reinterpretation of test done on 18/05/2017

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19/10/2015	[redacted] moved from [redacted], currently on holding
16/11/2015	[redacted] and [redacted], originally from [redacted], moved from [redacted], still in the herd. Other animals from [redacted] ([redacted], herd moved from Argyll) were moved on and off between 2009 and 2011
18/04/2017	3 Reactors (R) and 2 Inconclusive Reactors (IR) on Part 1 of RHT48 test
19/04/2017	5 Rs and 2 IRs on C2
02/05/2017	DRF visit carried out. Officially Tuberculosis Free status (OTF) suspended. The 8 animals were valued and slaughter was arranged.
07/05/2017	Post Mortem Examination (PME) Results: 3 animals presented visible lesions, all animals sampled for culture.
07/05/2017	OTF status withdrawn because of PME results. Disclosing test was re-interpreted at Severe. 3 new Reactors disclosed (previously IRs): [redacted], [redacted], [redacted]
12/05/2017	Check Test completed, 1 IR disclosed and isolated.
22/05/2017	PME Results: No visible Lesions found at Post Mortem of the 3 additional Reactors at Severe
12/06/2017	Part 1 of Gamma test sampling: 59 bloods were submitted
13/06/2017	Part 2 of Gamma test sampling: 48 bloods were submitted
19/06/2017	Gamma results received 6 Positives ([redacted], [redacted], [redacted], [redacted], [redacted], [redacted]) 2 animals require to be resampled at Sort Interval Test (SIT) ([redacted] and [redacted]). No visible Lesions found at PME
25/07/2017	1 st Short Interval Test: 123 animals tested, 4 Reactors disclosed: [redacted], [redacted], [redacted], [redacted]; [redacted], previously IR at CHT, was clear at retest. Gamma resamples: [redacted] to be resampled, [redacted] negative
11/08/2017	[redacted] was contacted during the week and the TB case in Skye hit the media. Reports on BBC and other media.
21/08/2017	Meeting between [redacted] (Case vet), [redacted]) and [redacted], and agri advisor [redacted] required by the farmer. Future testing, exit strategies and possible licenses to help the business in the next future discussed
22/08/2017	Culture results received for the first 12 R: all negative (still awaiting for the last 4 Rs) All 12 samples were also tested by HIAN PCR and were negative for the presence of mycobacteria
24/08/2017	Letter from [redacted] asking for future communication to be through him. All communications regarding testing arrangements, and all standard results letters will continue be sent to [redacted] as per standard procedure.
25/09/2017	1 st SIT was read at Sev interpretation to reduce the risk of IRs left in the herd. 120 animals tested, CLEAR TEST. second SIT scheduled for 24/11/17 or later
28/10/2107	Last 4 culture results received. All negative
28/11/2017	Clear 2 nd SIT. Farmer contacted asking to send valid BT05
11/12/2017	Valid BT05 received. TB10 served, follow-up RHT12 scheduled for 28/11/2017. BREAKDOWN CONCLUDED

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2. Background

- a) [redacted] owns a beef herd of approximately 140 animals. Mostly homebred with calving period in spring, with really occasional animals bought in: last 4 in 2014 from Aberdeenshire, just after the last clear Routine Herd Test. Animals are reared and fattened, then sold at the market in October. Livestock are of good quality and well looked after. The farm and sheds are situated in the valley, next to the river, ; the animals pass winter in the shed, with possibility of going out to the fields in front of the sheds, being fed with silage and spent grains from distilling. They are then turned out to the hill, where they graze during spring and summer period. No previous TB outbreaks in the area. This farm is adjacent to 2 other beef cattle farms that were tested clear at contiguous test when the status was changed to OTFW. Although a reported increase in wild deer in the area, there is no wildlife that can spread TB in the area, and that is anyway a negligible risk in Scotland.

3. bTB disclosure, Reactor and IR details

- a) The details for each Reactor are detailed in Table 4 that can be found in Appendix 1.
- b) In summary they are all homebred, apart from [redacted] which was purchased from [redacted] in Aberdeenshire in 2014.
- c) There is not a defined pattern to the reactors disclosed, with ages ranging from 11 years to 10 months. They are all females, some of them were with calf at foot when they were disclosed as Reactors, all fat and with good body condition.

d) Laboratory Results:

All 12 Reactors initially disclosed were cultured as normal procedure, results were negative.

AF-12-00858-17 : the spoligotyping was done on this sample. It is a Fail (not a surprise, as it was from liquid media).

The 3 VL's submitted:

AF-12-00854-17, Negative for solid and Liquid culture at 6 weeks. RC completed negative, insufficient sample so no Histology taken.

AF-12-00857-17, Negative for solid and Liquid culture at 6 weeks. RC completed negative, insufficient sample so no Histology taken

AF-12-00861-17, suspicious colonies present at 6 weeks, AF+ RS set up Negative at further 6 week read. MGIT also had the presence of AF+, I did re-sow this directly and this was also -ve at 6 weeks. Histology was taken and sent came back TYPTB AF-, but as culture failed to grow reported Negative as per SOP.

The atypical lesions and locations, insufficient samples (particularly for the VLs) may have influenced the culture times and results.

Considering the case was agreed the use of HAIN PCR. The 12 samples were tested

The details of the laboratory results can be found in Annex 3

Cultures from the 16 Reactors sent to the lab were negative.

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4. Spread tracings

- a) Window Dates: 60 days prior to date of last clear herd test that was carried out on 19/03/2013
- b) [redacted] usually sells store cattle annually through Thainstone Market in October;
- c) SCC Cardiff asked to proceed with Spread tracings on 9/05/2017, 2 days after OTFW status was confirmed.

5. Possible Sources of Infection

- a) Spoligotype/Genotype: no genotype was found out of 16 cultures

Most of the animals are homebred, but a small number of animals was moved/ bought some years ago:

[redacted], moved in July 2009 from [redacted], currently at [redacted].

[redacted], moved in April 2008 from [redacted], dead.

[redacted], moved from [redacted], previously at [redacted], currently at [redacted].

[redacted], moved from [redacted] through Stirling Auction Mart [redacted],

currently at [redacted]

[redacted], moved from [redacted], dead

All these animals were transferred from Argyll when the owner of CPH [redacted] moved to Skye and kept at [redacted] and other locations on the island. The owner of [redacted] confirmed some moves from England in the past. Testing history for this herd is not available.

[redacted] was bought in November 2014 from [redacted] with other 3 bulls. Clear herd with animals bought in from Ireland and England.

[redacted] was moved from [redacted] in October 2015

Also, [redacted] and [redacted], originally from [redacted], were moved from [redacted] in November 2015.

Although the culture results were not satisfactory, the various moves involving animals from [redacted], and the animals bought in from [redacted] have to be considered as the possible origin of the TB breakdown in Skye.

The fact that all the lab tests did not produce a positive *M bovis* culture represents nowadays the main issue in this case. The fact that 2 of the 3 VL were from mediastinal lymph nodes could represent the cause of possible uncertain results and difficulties in culturing.

Non Specific Reactor Procedure was considered as exit strategy..

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Considering that normally all reactors or IRs slaughtered at the first three tests must have been NVL on PME/PMI and have had negative culture results, this exemption had to be agreed with Veterinary Lead Scotland and Scottish Government.

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Table 2 – Reactors/IR’s movement and test background

Reactor id/ SH Case id	Date moved to	Source of animal	Comments.
[redacted]	21/11/2014	[redacted]	Part of a group of 4 bulls bought from a clear herd in Aberdeenshire. Various Trace tests and movements from England and Ireland registered for [redacted]. This animal was initially IR but became R at reinterpretation. All the other Reactors, including the VLs are homebred.

b) Contiguous herds

2 contiguous premises were considered during initial visit:

- [redacted], CPH [redacted], owned by [redacted];
- [redacted] [redacted], CPH [redacted], owned by [redacted];

No contact between herds during the last months, mostly because cattle were housed for winter. Because during the previous 4 years all herds passed most of the time hill grazing, and some boundaries on the hills are single fenced, the risk of direct contact and spread of the disease in such a long time window had to be considered.

Contiguous tests for both herds were scheduled and carried on at the beginning of June. Both herds were clear and were returned to their previous testing regime.

c) Wildlife

Farmer addressed increasing presence of deer in the surrounding area. The risk of wildlife spreading TB is considered negligible in the area and on the island of Skye.

d) Indirect Contact

No indirect contact source has been identified that could explain the disclosure of bovine TB on this holding

e) Conclusion

Currently we are still awaiting 4 culture results. One histology result confirming the presence of acid fast bacteria has been received, but it was then registered as Negative. The possibility of reculturing is currently being considered.

It is likely that infection has been brought into the herd and remained undisclosed until now. The infection has spread within the herd whilst the primary case has left the herd undetected is the most plausible source of risk.

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6. Discussion (including exit strategy)

;The initial objective was to lift restrictions before the middle of October, when [redacted] plans to sell animals to the market. Case Vet established a relatively invasive testing regime that planned in removing all possible risks before the Short Interval Tests.

4 Reactors were found at SIT, triggering 2 further tests.

Positive cultures would be important, [redacted]

Current action plan:

- a) Check test on animals that were not included in RHT48 (completed)
- b) Gamma test to clean up any possible undisclosed/residual infection (completed)
- c) Culture of Reactors disclosed at RHT48
- d) 1st SIT at Severe interpretation (4 Reactors disclosed)
- e) 2 further SIT
- f) Following the negative culture and PCR results, the possibility of non specific reactors procedures could be discussed, depending from next test results.

7. Conclusion

Clear 2nd SIT on 28th November 2017 . 141 animals tested. A valid BT05 was required to the farmer because the previous was sent before the disclosure of other Reactors.

Valid BT05 was received on 11/12/2017 and restrictions were lifted on the same day. Follow-up RHT 12 test scheduled for 28/11/2018.

The high number of Reactors removed, and the absence of a positive culture for *M. bovis* made it a quite difficult case with no clear indication regarding the origin of the breakdown.

Various options were considered, including non-specific reactors.

At this stage and with the evidence collected, the various indirect movements of animals from low risk areas and Scottish borders, and their introduction in the local herds, represents the most possible cause of infection.

[redacted].

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Appendix 1 DRF map 1

[redacted]

Map 2 - contiguous to [redacted]

[redacted]

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Appendix 2

Table 2: Reactor details

Test date	Test type	ID	Origin	Sex	DOB	Age at removal (mths)	Result Severe Standard	Reactions	PME	Culture
19/04/2017	RHT48	[redacted]	Homebred	F	20/04/2009	8 years	Std	A: 8 9 N B: 8 16 SO	NVL	negative
19/04/2017	RHT48	[redacted]	Homebred	F	06/02/2012	5 years	Std	A; 7 10 SO B: 7 20 SO	MES D 2 Y Gr A	negative
19/04/2017	RHT48	[redacted]	Homebred	F	23/05/2014	38 months	Std	A: 8 9 N B: 8 14 SO	NVL	negative
19/04/2017	RHT48	[redacted]	Homebred	F	30/10/2011	6 years	Std	A: 8 9 N B: 8 12 SO	NVL	negative
19/04/2017	RHT48	[redacted]	Homebred	F	21/04/2015	24 months	Std	A: 8 8 N B: 7 17 SO	RP D 2 Y Ca T~MES D 3 Y P A	negative
19/04/2017	RHT48	[redacted]	Homebred	F	01/04/2015	38 months	Std	A: 8 9 N B: 9 17 SO	NVL	negative
18/04/2017	RHT48	[redacted]	Homebred	F	15/05/2008	9 years	Std	A: 7 12 SO B: 7 17 SO	NVL	negative
18/04/2017	RHT48	[redacted]	Homebred	F	15/11/2008	8 ½ years	Std	A: 7 10 SO B: 7 16 SO	NVL	negative
18/04/2017	RHT48	[redacted]	Homebred	F	16/05/2006	11 years	Std	A: 8 8 N B: 7 17	MES D 3 Y P A	negative
18/04/2017	RHT48	[redacted]	Purchased from [redacted]	F	10/03/2013	49 months	Sev	A: 7 7 N B: 8 12 N	NVL	negative
18/04/2017	RHT48	[redacted]	Homebred	F	30/12/2007	10 years	Sev	A: 7 9 SO B: 8 13 SO	NVL	negative
12/6/2017	IFN	[redacted]	Homebred	F	9/04/2014	38 months	gamma	na	NVL	NA
12/06/2017	IFN	[redacted]	Homebred	F	18/10/2013	44 months	gamma	na	NVL	NA
12/06/2017	IFN	[redacted]	Homebred	F	22/04/2015	26 months	gamma	na	NVL	NA
12/06/2017	IFN	[redacted]	Homebred	F	05/04/2015	26 months	gamma	na	NVL	NA
13/06/2017	IFN	[redacted]	Homebred	F	08/10/2016	8 months	gamma	na	NVL	NA
13/06/2017	IFN	[redacted]	Homebred	F	15/03/2014	39 months	Gamma, was IR at RHT48	Na	NVL	NA
25/07/2017	SIT	[redacted]	Homebred	F	10/11/2008	8 ½ years	Sev	A: 7 11 C B: 6 20	NVL	negative

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