

Monthly Report: Surveillance Project SB4008 IFNg tests for bovine tuberculosis

(TC0651 and TC0751)

Number 142

Report Period 1st - 30th June 2018

Issued 10 July 2018

Operational notes on terminology, definitions, re-test and re-samples test outcomes:

- “Samples” refers to an individual tube of blood taken from an individual animal which is subsequently submitted for testing. It is generally assumed that the number of samples and the number of animals are analogous as any duplicate sample blood tube from the same animal will not be tested. However, minor discrepancies may occur where the same animal is tested more than once due to a request for a resample or the animal is tested twice under different categories (for example, as a PAR-RAPID and then as part of a PAR-HERD-S).
- “Submissions” refers to an individual batch or set of samples received for testing. Submissions may comprise 1 or more samples (for example, if an entire herd is being tested it is usually sent as 1 submission). It is generally assumed that the number of submissions and the number of herds are analogous.
- Retests are samples where the first ELISA assay fails and the same sample is retested on a new ELISA plate. Each sample can be retested only once. A retest is not a reportable test outcome.
- Resamples are where a sample has been retested and failed a second time, so that the lab requests a new sample. This is a reportable test outcome.
- Rejects are samples that are not tested by the lab for one of the following reasons: blood collected into wrong type of vacutainer, samples that have not been maintained at the appropriate temperature range ($22\pm5^{\circ}\text{C}$), unlabelled samples, broken or cracked tubes, blood that is extensively clotted (small clots are OK), samples received after 4pm on the day after sample collection. Such samples are reported separately in the tables and in figure 5.
- POS (pokeweed mitogen) is a sample positive control reagent which provides a measure of the quality/viability of the blood sample. A POS fail (< 0.45 optical density reading) may indicate compromised blood quality as a result of collection/transportation conditions or due to the animal having an unusually low/suppressed cellular immune response.
- NEG (no-antigen control) is a sample negative control which provides a measure of the background antigen-independent IFN- responses. A NEG fail (> 0.3 optical density reading) may indicate a laboratory procedures problem (normally resolved during re-test) or that an animal has unusually high background levels of IFN-g.

Test Criteria

Submission Reason	Explanation	Mandatory?
Possible Herd Slaughter (PAR-HERD-S)	Parallel interferon-gamma blood testing of skin test negative cattle to inform whole or partial herd slaughters decisions	YES, if APHA are contemplating a herd slaughter
Persistent TB breakdowns (OTF status withdrawn) (PAR-P-CONF) N.B. PAR-PERSIS from 1st April 2017	Parallel blood testing of skin test-negative cattle in persistently infected herds that have failed to resolve by repeated short-interval skin testing and fulfill a minimum of biosecurity standards.	NO (APHA discretion)
Parallel - Low Incidence (PAR-LOW-IN) N.B. PAR-NEW-IN from 1st April 2017	Parallel blood testing to maximise the probability of removing all infected cattle in a new herd breakdown as soon as possible after confirmation of TB.	YES in Area of Low Incidence
Rapid Testing of twice IR's (PAR-RAPID)	Parallel blood testing of two-times IRs identified under the severe interpretation of the skin test used in Wales.	YES (Wales only)
PAR-CUL-N	Parallel blood testing to maximise the probability of removing all infected cattle in a new breakdown as soon as possible after confirmation of TB where herd is situated in badger control areas of England that have completed at least 2 effective culls.	YES (in eligible badger control areas of England)
PAR-CUL-P	Parallel blood testing to maximise the probability of removing all infected cattle in a persistent confirmed breakdown where herd is situated within badger control areas of England that have completed at least 2 effective culls	NO (APHA discretion)
Parallel Other (PAR-OTHER)	Other parallel blood testing not covered in any of the other scenarios	NO (APHA discretion)
'NSR' Herds (SER-NSR)	Modified serial blood testing of individual skin test reactors and/or IRs in unconfirmed TB breakdown herds to clarify their infection status where there is evidence of non-specific sensitisation to bovine tuberculin (the "non-specific reactor" procedure)	NO (APHA discretion)
Suspected Fraud (SER-FRAUD)	Modified serial blood test of suspected fraudulent reactors to the skin test (animals with abnormal skin swellings), in confirmed or unconfirmed TB incidents.	NO (APHA discretion to firm up or rule out any suspicion of fraud and support any investigations)
Serial Other (SER-OTHER)	Serial test – other reasons	NO (APHA Discretion)
SER-FLEXI	Extended blood test to provide flexible test readout in a confirmed M. bovis-infected herd where Johne's (M. a. paratuberculosis) infection or vaccination is suspected to be interfering with M. bovis infection detection	NO (APHA discretion)

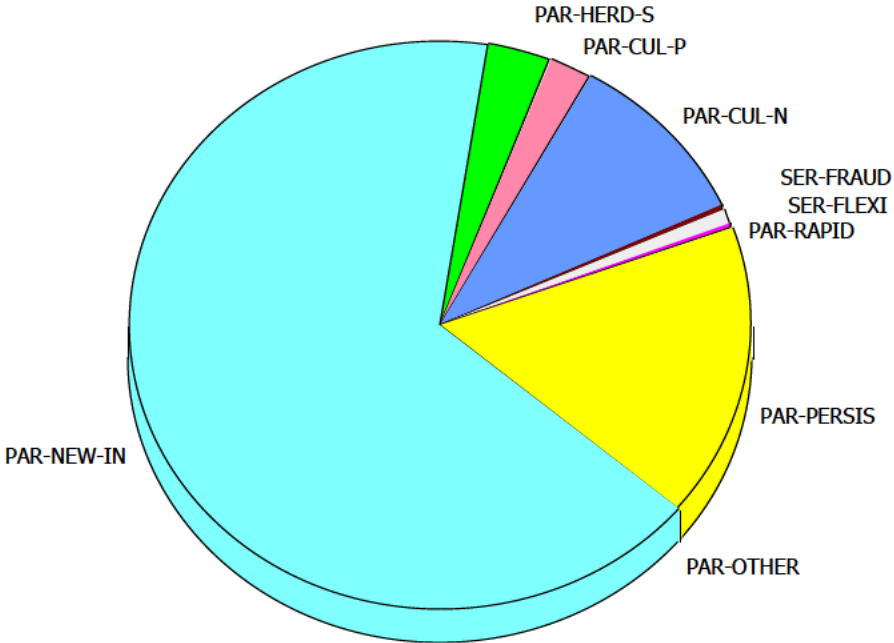
Table 1. Monthly Totals for June 2018

		Num samples June 2018	%	Total 2018	%
Submissions		187		1234	
Samples	Total (%)	18891	100.00 %	118235	100.00 %
	England	15519	82.15 %	89794	75.95 %
	Wales	3345	17.71 %	26623	22.52 %
	Scotland	27	0.14 %	1818	1.54 %
Parallel Tests	PAR-CUL-N	1874	9.92 %	9275	7.84 %
	PAR-CUL-P	426	2.26 %	3901	3.30 %
	PAR-HERD-S	589	3.12 %	2632	2.23 %
	PAR-NEW-IN	12554	66.45 %	64190	54.29 %
	PAR-OTHER	23	0.12 %	1298	1.10 %
	PAR-PERSIS	3152	16.69 %	32313	27.33 %
	PAR-RAPID	61	0.32 %	732	0.62 %
	Total(% of all samples)	18679	98.88 %	114341	96.71 %
Serial/Extended Tests	SER-FLEXI	144	0.76 %	3646	3.08 %
	SER-FRAUD	68	0.36 %	229	0.19 %
	SER-NSR	0	0.00 %	19	0.02 %
	SER-OTHER	0	0.00 %		
	Total(% of all samples)	212	1.12 %	3894	3.29 %
	Total	18891	100.00 %	118235	100.00 %
Retests	Total (% of all samples)	1825	9.66 %	8384	7.09 %
	England	1426	7.55 %	6330	5.35 %
	Wales	382	2.02 %	1894	1.60 %
	Scotland	17	0.09 %	160	0.14 %
Resamples	Total (% of all samples)	1326	7.02 %	6167	5.22 %
	England	1005	5.32 %	4583	3.88 %
	Wales	309	1.64 %	1473	1.25 %
	Scotland	12	0.06 %	111	0.09 %
Rejects	Total (% of all samples)	3	0.02 %	1778	1.50 %
	England	3	0.02 %	724	0.61 %
	Wales	0	0.00 %	1054	0.89 %
	Scotland	0	0.00 %		

PAR-HERD-S: potential herd slaughter, PAR-P-CONF (PAR-PERSIS from 1 April 2017): persistent TB breakdown OTFW, PAR-LOW-IN (PAR-NEW-IN from 1 April 2017): parallel low incidence, PAR-RAPID: rapid testing of twice IRs, PAR-CUL-N: new infection in cull area, PAR-CUL-P: persistent infection in cull area, PAR-OTHER: parallel other, SER-FLEXI: flexible extended test in confirmed herds with concurrent Johne's infection/vaccination, SER-NSR: serial non-specific reactor, SER-FRAUD: serial potential fraud, SER-OTHER: serial other

Figure 1. Number of samples submitted in each category during June 2018

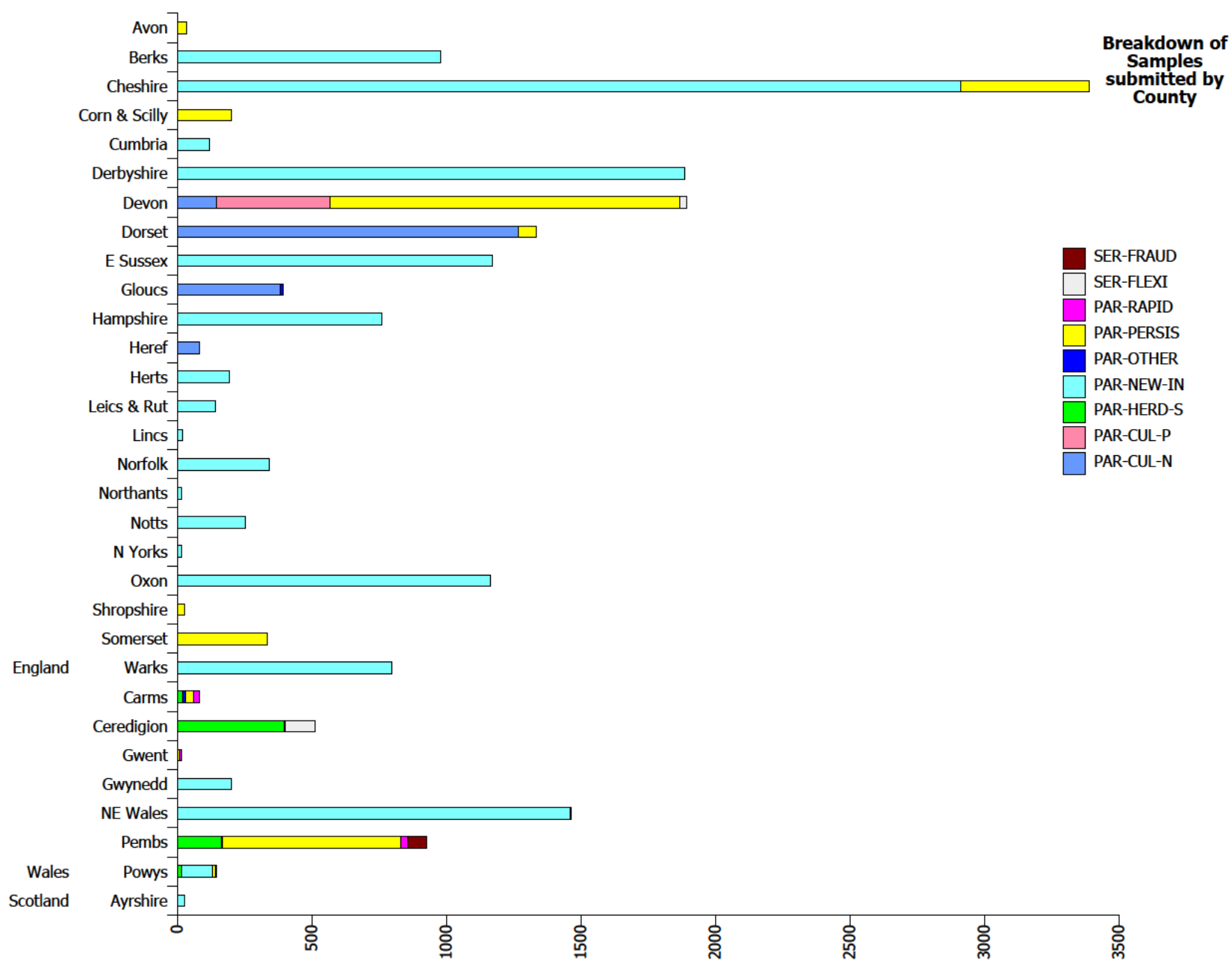
Breakdown of Reason for submission



PAR-CUL-N	1874	9.9 %
PAR-CUL-P	426	2.3 %
PAR-HERD-S	589	3.1 %
PAR-NEW-IN	12554	66.5 %
PAR-OTHER	23	0.1 %
PAR-PERSIS	3152	16.7 %
PAR-RAPID	61	0.3 %
SER-FLEXI	144	0.8 %
SER-FRAUD	68	0.4 %
Total	18891	100.00 %

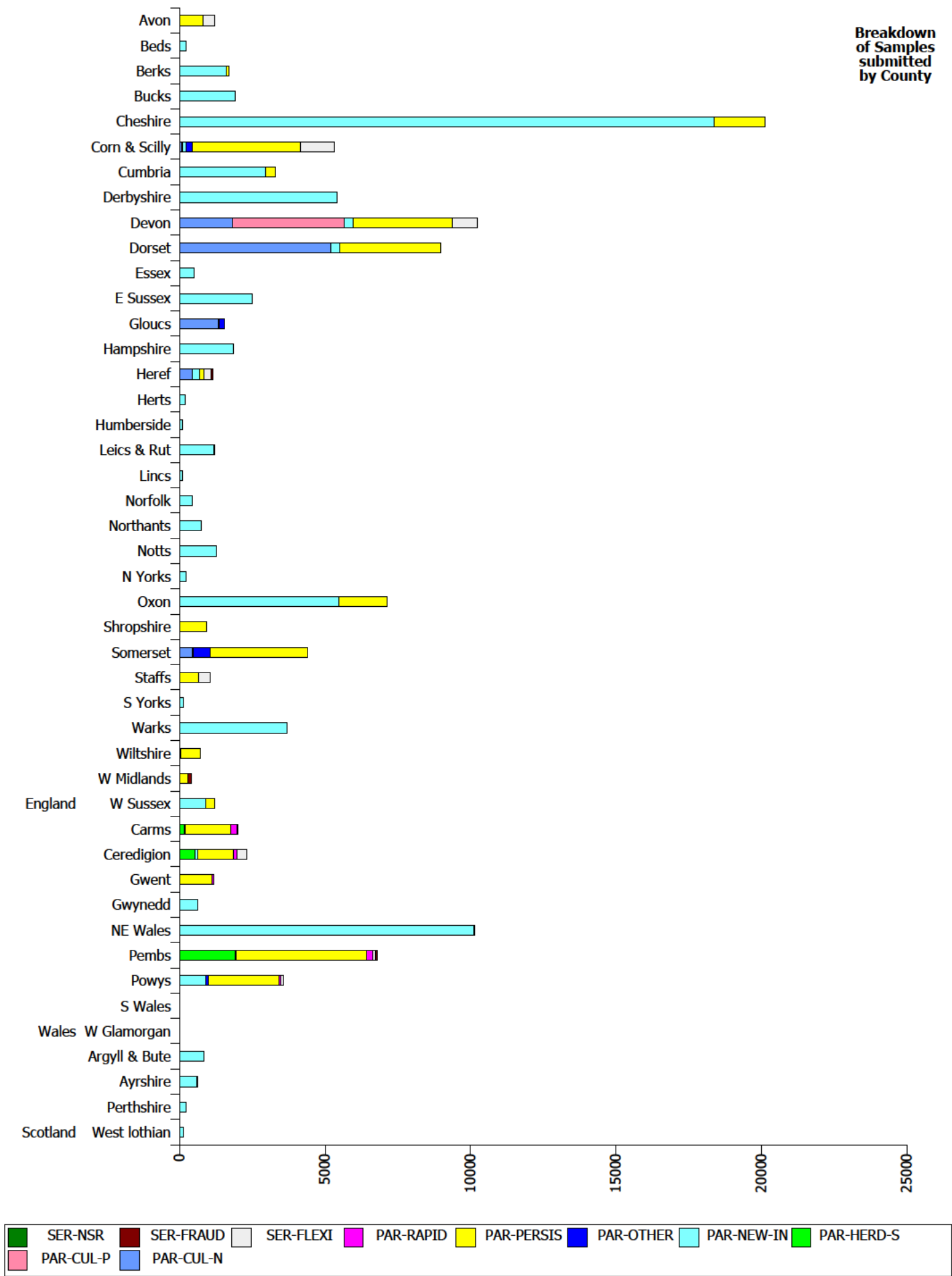
PAR-HERD-S: potential herd slaughter, PAR-P-CONF (PAR-PERSIS from 1 April 2017): persistent TB breakdown OTFW, PAR-LOW-IN (PAR-NEW-IN from 1 April 2017): parallel low incidence, PAR-RAPID: rapid testing of twice IRs, PAR-CUL-N: new infection in cull area, PAR-CUL-P: persistent infection in cull area, PAR-OTHER: parallel other, SER-FLEXI: flexible extended test in confirmed herds with concurrent Johne's infection/vaccination, SER-NSR: serial non-specific reactor, SER-FRAUD: serial potential fraud, SER-OTHER: serial other

Figure 2. Number of samples submitted in each category by County during June 2018



PAR-HERD-S: potential herd slaughter, PAR-P-CONF (PAR-PERSIS from 1 April 2017): persistent TB breakdown OTFW, PAR-LOW-IN (PAR-NEW-IN from 1 April 2017): parallel low incidence, PAR-RAPID: rapid testing of twice IRs, PAR-CUL-N: new infection in cull area, PAR-CUL-P: persistent infection in cull area, PAR-OTHER: parallel other, SER-FLEXI: flexible extended test in confirmed herds with concurrent Johne's infection/vaccination, SER-NSR: serial non-specific reactor, SER-FRAUD: serial potential fraud, SER-OTHER: serial other

Figure 3. Number of samples submitted in each category by County during 2018



PAR-HERD-S: potential herd slaughter, PAR-P-CONF (PAR-PERSIS from 1 April 2017): persistent TB breakdown OTFW, PAR-LOW-IN (PAR-NEW-IN from 1 April 2017): parallel low incidence, PAR-RAPID: rapid testing of twice IRs, PAR-CUL-N: new infection in cull area, PAR-CUL-P: persistent infection in cull area, PAR-OTHER: parallel other, SER-FLEXI: flexible extended test in confirmed herds with concurrent Johne's infection/vaccination, SER-NSR: serial non-specific reactor, SER-FRAUD: serial potential fraud, SER-OTHER: serial other

Table 2a. Summary by County for June 2018

Country	County	Submission Reasons*	No. subs	Samples		Gamma Positive		Gamma Negatives		Retest*		Resample		Reject	
				n	% of total	n	%	n	%	n	%				
England - HRA	Avon	PAR-PERSIS	1	34	0.18 %	0	0.00 %	31	91.18 %	4	11.76 %	3	8.82 %	0	0.00 %
	Corn & Scilly	PAR-PERSIS	2	199	1.05 %	8	4.02 %	182	91.46 %	9	4.52 %	9	4.52 %	0	0.00 %
	Devon	PAR-CUL-N	3	144	0.76 %	17	11.81 %	119	82.64 %	27	18.75 %	8	5.56 %	0	0.00 %
		PAR-CUL-P	1	424	2.24 %	9	2.12 %	402	94.81 %	18	4.25 %	13	3.07 %	0	0.00 %
		PAR-PERSIS	7	1,298	6.87 %	52	4.01 %	1178	90.76 %	89	6.86 %	68	5.24 %	0	0.00 %
		SER-FLEXI	1	26	0.14 %	0	0.00 %	25	96.15 %	1	3.85 %	1	3.85 %	0	0.00 %
	Dorset	PAR-CUL-N	5	1,268	6.71 %	32	2.52 %	1156	91.17 %	102	8.04 %	80	6.31 %	0	0.00 %
		PAR-PERSIS	1	67	0.35 %	3	4.48 %	46	68.66 %	26	38.81 %	18	26.87 %	0	0.00 %
	Gloucs	PAR-CUL-N	10	381	2.02 %	35	9.19 %	311	81.63 %	66	17.32 %	35	9.19 %	0	0.00 %
		PAR-CUL-P	1	2	0.01 %	0	0.00 %	2	100.00 %	0	0.00 %	0	0.00 %	0	0.00 %
		PAR-OTHER	1	8	0.04 %	0	0.00 %	7	87.50 %	4	50.00 %	1	12.50 %	0	0.00 %
	Heref	PAR-CUL-N	4	81	0.43 %	5	6.17 %	65	80.25 %	14	17.28 %	11	13.58 %	0	0.00 %
	Shropshire	PAR-PERSIS	2	26	0.14 %	2	7.69 %	19	73.08 %	5	19.23 %	5	19.23 %	0	0.00 %
	Somerset	PAR-PERSIS	3	333	1.76 %	34	10.21 %	268	80.48 %	46	13.81 %	31	9.31 %	0	0.00 %
England - Edge	Berks	PAR-NEW-IN	5	976	5.17 %	62	6.35 %	829	84.94 %	130	13.32 %	85	8.71 %	0	0.00 %
	Cheshire	PAR-NEW-IN	13	2,910	15.40 %	72	2.47 %	2701	92.82 %	202	6.94 %	137	4.71 %	0	0.00 %
		PAR-PERSIS	1	479	2.54 %	3	0.63 %	437	91.23 %	45	9.39 %	37	7.72 %	2	0.42 %
	Derbyshire	PAR-NEW-IN	14	1,886	9.98 %	80	4.24 %	1677	88.92 %	179	9.49 %	129	6.84 %	0	0.00 %
	E Sussex	PAR-NEW-IN	5	1,170	6.19 %	49	4.19 %	1069	91.37 %	71	6.07 %	52	4.44 %	0	0.00 %
	Hampshire	PAR-NEW-IN	7	761	4.03 %	16	2.10 %	724	95.14 %	40	5.26 %	21	2.76 %	0	0.00 %
	Leics & Rut	PAR-NEW-IN	1	140	0.74 %	7	5.00 %	105	75.00 %	37	26.43 %	28	20.00 %	0	0.00 %
	Northants	PAR-NEW-IN	1	16	0.08 %	0	0.00 %	12	75.00 %	6	37.50 %	4	25.00 %	0	0.00 %
	Notts	PAR-NEW-IN	4	252	1.33 %	6	2.38 %	227	90.08 %	28	11.11 %	19	7.54 %	0	0.00 %
	Oxon	PAR-NEW-IN	7	1,163	6.16 %	53	4.56 %	1015	87.27 %	118	10.15 %	95	8.17 %	0	0.00 %
	Warks	PAR-NEW-IN	9	796	4.21 %	23	2.89 %	715	89.82 %	80	10.05 %	57	7.16 %	1	0.13 %
England - LRA	Cumbria	PAR-NEW-IN	3	117	0.62 %	3	2.56 %	111	94.87 %	10	8.55 %	3	2.56 %	0	0.00 %
	Herts	PAR-NEW-IN	1	191	1.01 %	2	1.05 %	172	90.05 %	20	10.47 %	17	8.90 %	0	0.00 %
	Lincs	PAR-NEW-IN	1	19	0.10 %	0	0.00 %	15	78.95 %	6	31.58 %	4	21.05 %	0	0.00 %
	Norfolk	PAR-NEW-IN	1	339	1.79 %	7	2.06 %	300	88.50 %	38	11.21 %	32	9.44 %	0	0.00 %
	N Yorks	PAR-NEW-IN	1	13	0.07 %	0	0.00 %	11	84.62 %	5	38.46 %	2	15.38 %	0	0.00 %
England			116	15519	82.15 %	580	3.74 %	13931	89.77 %	1426	9.19 %	1005	6.48 %	3	0.02 %
Wales - High TB	Carms	PAR-HERD-S	2	17	0.09 %	1	5.88 %	16	94.12 %	0	0.00 %	0	0.00 %	0	0.00 %
		PAR-OTHER	2	13	0.07 %	1	7.69 %	12	92.31 %	1	7.69 %	0	0.00 %	0	0.00 %
		PAR-PERSIS	3	31	0.16 %	3	9.68 %	26	83.87 %	7	22.58 %	2	6.45 %	0	0.00 %
		PAR-RAPID	4	20	0.11 %	4	20.00 %	16	80.00 %	0	0.00 %	0	0.00 %	0	0.00 %
		SER-FLEXI	1	2	0.01 %	0	0.00 %	2	100.00 %	0	0.00 %	0	0.00 %	0	0.00 %
	Ceredigion	PAR-HERD-S	1	1	0.01 %	0	0.00 %	1	100.00 %	0	0.00 %	0	0.00 %	0	0.00 %
		PAR-RAPID	2	3	0.02 %	1	33.33 %	2	66.67 %	0	0.00 %	0	0.00 %	0	0.00 %
	Gwent	PAR-PERSIS	1	9	0.05 %	2	22.22 %	5	55.56 %	3	33.33 %	2	22.22 %	0	0.00 %
		PAR-RAPID	3	7	0.04 %	1	14.29 %	6	85.71 %	0	0.00 %	0	0.00 %	0	0.00 %
	Pembs	PAR-HERD-S	1	164	0.87 %	6	3.66 %	152	92.68 %	7	4.27 %	6	3.66 %	0	0.00 %
		PAR-OTHER	1	2	0.01 %	0	0.00 %	2	100.00 %	0	0.00 %	0	0.00 %	0	0.00 %
		PAR-PERSIS	7	663	3.51 %	19	2.87 %	620	93.51 %	35	5.28 %	24	3.62 %	0	0.00 %
		PAR-RAPID	13	28	0.15 %	7	25.00 %	21	75.00 %	0	0.00 %	0	0.00 %	0	0.00 %
		SER-FRAUD	1	68	0.36 %	55	80.88 %	13	19.12 %	1	1.47 %	0	0.00 %	0	0.00 %
	Powys	PAR-HERD-S	2	13	0.07 %	1	7.69 %	12	92.31 %	0	0.00 %	0	0.00 %	0	0.00 %
		PAR-PERSIS	2	10	0.05 %	0	0.00 %	9	90.00 %	1	10.00 %	1	10.00 %	0	0.00 %
		SER-FLEXI	1	6	0.03 %	0	0.00 %	6	100.00 %	0	0.00 %	0	0.00 %	0	0.00 %
Wales - Intermediate TB	Ceredigion	PAR-HERD-S	3	394	2.09 %	1	0.25 %	270	68.53 %	132	33.50 %	123	31.22 %	0	0.00 %
		PAR-PERSIS	1	3	0.02 %	0	0.00 %	3	100.00 %	0	0.00 %	0	0.00 %	0	0.00 %
		SER-FLEXI	2	110	0.58 %	3	2.73 %	102	92.73 %	6	5.45 %	5	4.55 %	0	0.00 %
	NE Wales	PAR-NEW-IN	10	1,225	6.48 %	11	0.90 %	1110	90.61 %	122	9.96 %	104	8.49 %	0	0.00 %
		PAR-RAPID	2	3	0.02 %	0	0.00 %	3	100.00 %	0	0.00 %	0	0.00 %	0	0.00 %
	Powys	PAR-NEW-IN	2	116	0.61 %	1	0.86 %	114	98.28 %	14	12.07 %	1	0.86 %	0	0.00 %
Wales - Low TB	Gwynedd	PAR-NEW-IN	1	201	1.06 %	1	0.50 %	186	92.54 %	20	9.95 %	14	6.97 %	0	0.00 %
	NE Wales	PAR-NEW-IN	2	236	1.25 %	3	1.27 %	206	87.29 %	33	13.98 %	27	11.44 %	0	0.00 %
Wales			70	3345	17.71 %	121	3.62 %	2915	87.14 %	382	11.42 %	309	9.24 %	0	0.00 %
Scotland - Scotland	Ayrshire	PAR-NEW-IN	1	27	0.14 %	0	0.00 %	15	55.56 %	17	62.96 %	12	44.44 %	0	0.00 %
Scotland			1	27	0.14 %	0	0.00 %	15	55.56 %	17	62.96 %	12	44.44 %	0	0.00 %
Grand Total		Sum:	187	18891		701		16861		1825		1326		3	

*For test criteria please refer to Operational notes.

* Sufficient plasma supernatant is collected and stored following the overnight culture stage of the assay such that if the sample fails any of the QC criteria, it is possible for the laboratory to 're-test' the original sample. Depending on the outcome of a retest, a resample (if QC criteria fail to be met), a positive or a negative result will be reported. Therefore, the total number of samples = the sum of positive, negative, resample and reject samples only.

PAR-HERD-S: potential herd slaughter, PAR-P-CONF (PAR-PERSIS from 1 April 2017): persistent TB breakdown OTFW, PAR-LOW-IN (PAR-NEW-IN from 1 April 2017): parallel low incidence, PAR-RAPID: rapid testing of twice IRs, PAR-CUL-N: new infection in cull area, PAR-CUL-P: persistent infection in cull area, PAR-OTHER: parallel other, SER-FLEXI: flexible extended test in confirmed herds with concurrent Johne's infection/vaccination, SER-NSR: serial non-specific reactor, SER-FRAUD: serial potential fraud, SER-OTHER: serial other

England: HRA (High Risk Area), LRA (Low Risk Area), Edge (Edge Area) Wales: High TB (Area), Low TB (Area), Int. TB (Intermediate TB Area)

Table 3a. Summary of IFN Gamma results by country and protocol June 2018

Country	Protocol	No submissions	Samples		Positive		Negatives		Retest*		Resample		Reject	
			n	% of total	n	%	n	%	n	%	n	%	n	%
England	Parallel	115	15493	99.8%	580	3.7%	13906	89.8%	1425	9.2%	1004	6.5%	3	0.0%
	Serial/Extended	1	26	0.2%	0	0.0 %	25	96.2%	1	3.8%	1	3.8%	0	0.0 %
	Total	116	15519	100.0%	580	3.7%	13931	89.8%	1426	9.2%	1005	6.5%	3	0.0%
Scotland	Parallel	1	27	100.0%	0	0.0 %	15	55.6%	17	63.0%	12	44.4%	0	0.0 %
	Serial/Extended	0	0	0.0 %	0	0.0 %	0	0.0 %	0	0.0 %	0	0.0 %	0	0.0 %
	Total	1	27	100.0%	0	0.0 %	15	55.6%	17	63.0%	12	44.4%	0	0.0 %
Wales	Parallel	65	3159	94.4%	63	2.0%	2792	88.4%	375	11.9%	304	9.6%	0	0.0 %
	Serial/Extended	5	186	5.6%	58	31.2%	123	66.1%	7	3.8%	5	2.7%	0	0.0 %
	Total	70	3345	100.0%	121	3.6%	2915	87.1%	382	11.4%	309	9.2%	0	0.0 %
GB	Parallel	181	18679	98.9%	643	3.4%	16713	89.5%	1817	9.7%	1320	7.1%	3	0.0%
	Serial/Extended	6	212	1.1%	58	27.4%	148	69.8%	8	3.8%	6	2.8%	0	0.0 %
	Total	187	18891	100.0%	701	3.7%	16861	89.3%	1825	9.7%	1326	7.0%	3	0.0%

* Sufficient plasma supernatant is collected and stored following the overnight culture stage of the assay such that if the sample fails any of the QC criteria, it is possible for the laboratory to 're-test' the original sample. Depending on the outcome of a retest, a resample (if QC criteria fail to be met), a positive or a negative result will be reported. Therefore, the total number of samples = the sum of positive, negative, resample and reject samples only.

Table 3b. Summary of IFN Gamma results by country and protocol (Total 2018)

Country	Protocol	No submissions	Samples		Positive		Negatives		Retest*		Resample		Reject	
			n	% of total	n	%	n	%	n	%	n	%	n	%
England	Parallel	635	86519	96.4%	4453	5.1%	76923	88.9%	6122	7.1%	4430	5.1%	713	0.8%
	Serial/Extended	34	3275	3.6%	334	10.2%	2777	84.8%	208	6.4%	153	4.7%	11	0.3%
	Total	669	89794	100.0%	4787	5.3%	79700	88.8%	6330	7.0%	4583	5.1%	724	0.8%
Scotland	Parallel	23	1818	100.0%	159	8.7%	1548	85.1%	160	8.8%	111	6.1%	0	0.0 %
	Serial/Extended	0	0	0.0 %	0	0.0 %	0	0.0 %	0	0.0 %	0	0.0 %	0	0.0 %
	Total	23	1818	100.0%	159	8.7%	1548	85.1%	160	8.8%	111	6.1%	0	0.0 %
Wales	Parallel	524	26004	97.7%	954	3.7%	22615	87.0%	1859	7.1%	1448	5.6%	987	3.8%
	Serial/Extended	18	619	2.3%	98	15.8%	429	69.3%	35	5.7%	25	4.0%	67	10.8%
	Total	542	26623	100.0%	1052	4.0%	23044	86.6%	1894	7.1%	1473	5.5%	1054	4.0%
GB	Parallel	1182	114341	96.7%	5566	4.9%	101086	88.4%	8141	7.1%	5989	5.2%	1700	1.5%
	Serial/Extended	52	3894	3.3%	432	11.1%	3206	82.3%	243	6.2%	178	4.6%	78	2.0%
	Total	1234	118235	100.0%	5998	5.1%	104292	88.2%	8384	7.1%	6167	5.2%	1778	1.5%

* Sufficient plasma supernatant is collected and stored following the overnight culture stage of the assay such that if the sample fails any of the QC criteria, it is possible for the laboratory to 're-test' the original sample. Depending on the outcome of a retest, a resample (if QC criteria fail to be met), a positive or a negative result will be reported. Therefore, the total number of samples = the sum of positive, negative, resample and reject samples only.

Table 4a. Summary of IFN Gamma results by submission reason (June 2018)

	Submission Reason	No submissions	Samples		Gamma Positive		Gamma Negatives		Retest		Resample		Reject	
			n	% of total	n	%	n	%	n	%	n	%	n	%
GB														
	Extended Flexible IFN-GAMMA test	5	144	0.8%	3	2.1%	135	93.8%	7	4.9 %	6	4.2 %	0	
	Parallel - Herd or Group Slaughter	9	589	3.1%	9	1.5%	451	76.6%	139	23.6 %	129	21.9 %	0	
	Parallel New Infection	89	12554	66.5%	396	3.2%	11314	90.1%	1176	9.4 %	843	6.7 %	1	0.0 %
	Parallel - new infection cull area	22	1874	9.9%	89	4.7%	1651	88.1%	209	11.2 %	134	7.2 %	0	
	Parallel - Other	4	23	0.1%	1	4.3%	21	91.3%	5	21.7 %	1	4.3 %	0	
	Parallel Persistent Infection	31	3152	16.7%	126	4.0%	2824	89.6%	270	8.6 %	200	6.3 %	2	0.1 %
	Parallel - persistent infection cull area	2	426	2.3%	9	2.1%	404	94.8%	18	4.2 %	13	3.1 %	0	
	Parallel - Rapid Testing Two-times IRs	24	61	0.3%	13	21.3%	48	78.7%	0		0		0	
	Serial - Anomalous Reaction	1	68	0.4%	55	80.9%	13	19.1%	1	1.5 %	0		0	
	Total	187	18891	100.0%	701	3.7%	16861	89.3%	1825	9.7 %	1326	7.0 %	3	0.0 %
England - HRA	Extended Flexible IFN-GAMMA test	1	26	0.1%	0	0.0 %	25	96.2%	1	3.8 %	1	3.8 %	0	
	Parallel - new infection cull area	22	1874	9.9%	89	4.7%	1651	88.1%	209	11.2 %	134	7.2 %	0	
	Parallel - Other	1	8	0.0%	0	0.0 %	7	87.5%	4	50.0 %	1	12.5 %	0	
	Parallel Persistent Infection	16	1957	10.4%	99	5.1%	1724	88.1%	179	9.1 %	134	6.8 %	0	
	Parallel - persistent infection cull area	2	426	2.3%	9	2.1%	404	94.8%	18	4.2 %	13	3.1 %	0	
England - HRA		42	4291	22.7%	197	4.6%	3811	88.8%	411	9.6 %	283	6.6 %	0	
England - Edge	Parallel New Infection	66	10070	53.3%	368	3.7%	9074	90.1%	891	8.8 %	627	6.2 %	1	0.0 %
	Parallel Persistent Infection	1	479	2.5%	3	0.6%	437	91.2%	45	9.4 %	37	7.7 %	2	0.4 %
England - Edge		67	10549	55.8%	371	3.5%	9511	90.2%	936	8.9 %	664	6.3 %	3	0.0 %
England - LRA	Parallel New Infection	7	679	3.6%	12	1.8%	609	89.7%	79	11.6 %	58	8.5 %	0	
England - LRA		7	679	3.6%	12	1.8%	609	89.7%	79	11.6 %	58	8.5 %	0	
Wales - High TB	Extended Flexible IFN-GAMMA test	2	8	0.0%	0	0.0 %	8	100.0%	0		0		0	
	Parallel - Herd or Group Slaughter	6	195	1.0%	8	4.1%	181	92.8%	7	3.6 %	6	3.1 %	0	
	Parallel - Other	3	15	0.1%	1	6.7%	14	93.3%	1	6.7 %	0		0	
	Parallel Persistent Infection	13	713	3.8%	24	3.4%	660	92.6%	46	6.5 %	29	4.1 %	0	
	Parallel - Rapid Testing Two-times IRs	22	58	0.3%	13	22.4%	45	77.6%	0		0		0	
	Serial - Anomalous Reaction	1	68	0.4%	55	80.9%	13	19.1%	1	1.5 %	0		0	
Wales - High TB		47	1057	5.6%	101	9.6%	921	87.1%	55	5.2 %	35	3.3 %	0	
Wales - Intermediate TB	Extended Flexible IFN-GAMMA test	2	110	0.6%	3	2.7%	102	92.7%	6	5.5 %	5	4.5 %	0	
	Parallel - Herd or Group Slaughter	3	394	2.1%	1	0.3%	270	68.5%	132	33.5 %	123	31.2 %	0	
	Parallel New Infection	12	1341	7.1%	12	0.9%	1224	91.3%	136	10.1 %	105	7.8 %	0	
	Parallel Persistent Infection	1	3	0.0%	0	0.0 %	3	100.0%	0		0		0	
	Parallel - Rapid Testing Two-times IRs	2	3	0.0%	0	0.0 %	3	100.0%	0		0		0	
Wales - Intermediate TB		20	1851	9.8%	16	0.9%	1602	86.5%	274	14.8 %	233	12.6 %	0	
Wales - Low TB	Parallel New Infection	3	437	2.3%	4	0.9%	392	89.7%	53	12.1 %	41	9.4 %	0	
Wales - Low TB		3	437	2.3%	4	0.9%	392	89.7%	53	12.1 %	41	9.4 %	0	
Scotland - Scotland	Parallel New Infection	1	27	0.1%	0	0.0 %	15	55.6%	17	63.0 %	12	44.4 %	0	
Scotland - Scotland		1	27	0.1%	0	0.0 %	15	55.6%	17	63.0 %	12	44.4 %	0	

Table 4b. Summary of IFN Gamma results by submission reason (Total 2018)

	Submission Reason	No submissions	Samples		Gamma Positive		Gamma Negatives		Retest		Resample		Reject	
			n	% of total	n	%	n	%	n	%	n	%	n	%
GB														
	Extended Flexible IFN-GAMMA test	42	3646	3.1%	374	10.3%	3024	82.9%	230	6.3%	170	4.7%	78	2.1%
	Parallel - Herd or Group Slaughter	38	2632	2.2%	59	2.2%	1996	75.8%	247	9.4%	212	8.1%	365	13.9%
	Parallel New Infection	541	64190	54.3%	2560	4.0%	57720	89.9%	4862	7.6%	3492	5.4%	418	0.7%
	Parallel - new infection cull area	96	9275	7.8%	603	6.5%	8033	86.6%	669	7.2%	485	5.2%	154	1.7%
	Parallel - Other	35	1298	1.1%	143	11.0%	993	76.5%	75	5.8%	54	4.2%	108	8.3%
	Parallel Persistent Infection	247	32313	27.3%	1774	5.5%	28385	87.8%	2081	6.4%	1601	5.0%	553	1.7%
	Parallel - persistent infection cull area	16	3901	3.3%	254	6.5%	3432	88.0%	166	4.3%	115	2.9%	100	2.6%
	Parallel - Rapid Testing Two-times IRs	209	732	0.6%	173	23.6%	527	72.0%	41	5.6%	30	4.1%	2	0.3%
	Serial - Anomalous Reaction	7	229	0.2%	58	25.3%	163	71.2%	13	5.7%	8	3.5%	0	
	Serial - Suspected NSR Herd	3	19	0.0%	0	0.0%	19	100.0%	0		0		0	
	Total	1234	118235	100.0%	5998	5.1%	104292	88.2%	8384	7.1%	6167	5.2%	1778	1.5%
England - HRA	Extended Flexible IFN-GAMMA test	25	3095	2.6%	331	10.7%	2608	84.3%	196	6.3%	145	4.7%	11	0.4%
	Parallel New Infection	12	1196	1.0%	82	6.9%	1040	87.0%	91	7.6%	62	5.2%	12	1.0%
	Parallel - new infection cull area	96	9275	7.8%	603	6.5%	8033	86.6%	669	7.2%	485	5.2%	154	1.7%
	Parallel - Other	15	1064	0.9%	89	8.4%	818	76.9%	67	6.3%	49	4.6%	108	10.2%
	Parallel Persistent Infection	87	17415	14.7%	1083	6.2%	15553	89.3%	1046	6.0%	752	4.3%	27	0.2%
	Parallel - persistent infection cull area	16	3901	3.3%	254	6.5%	3432	88.0%	166	4.3%	115	2.9%	100	2.6%
	Serial - Anomalous Reaction	6	161	0.1%	3	1.9%	150	93.2%	12	7.5%	8	5.0%	0	
England - Edge	Parallel New Infection	330	43800	37.0%	1911	4.4%	39281	89.7%	3381	7.7%	2401	5.5%	207	0.5%
	Parallel - Other	2	2	0.0%	0	0.0%	1	50.0%	1	50.0%	1	50.0%	0	
	Parallel Persistent Infection	22	3508	3.0%	198	5.6%	2956	84.3%	282	8.0%	252	7.2%	102	2.9%
	Serial - Suspected NSR Herd	3	19	0.0%	0	0.0%	19	100.0%	0		0		0	
England - LRA	Parallel New Infection	52	5731	4.8%	216	3.8%	5228	91.2%	386	6.7%	284	5.0%	3	0.1%
	Parallel Persistent Infection	3	627	0.5%	17	2.7%	581	92.7%	33	5.3%	29	4.6%	0	
England		669	89794	75.9%	4787	5.3%	79700	88.8%	6330	7.0%	4583	5.1%	724	0.8%
Wales - High TB	Extended Flexible IFN-GAMMA test	15	441	0.4%	40	9.1%	314	71.2%	28	6.3%	20	4.5%	67	15.2%
	Parallel - Herd or Group Slaughter	32	2096	1.8%	56	2.7%	1602	76.4%	100	4.8%	74	3.5%	364	17.4%
	Parallel New Infection	15	610	0.5%	8	1.3%	577	94.6%	34	5.6%	25	4.1%	0	
	Parallel - Other	16	184	0.2%	14	7.6%	166	90.2%	6	3.3%	4	2.2%	0	
	Parallel Persistent Infection	133	10673	9.0%	455	4.3%	9226	86.4%	719	6.7%	568	5.3%	424	4.0%
	Parallel - Rapid Testing Two-times IRs	184	633	0.5%	149	23.5%	454	71.7%	39	6.2%	29	4.6%	1	0.2%
	Serial - Anomalous Reaction	1	68	0.1%	55	80.9%	13	19.1%	1	1.5%	0		0	
Wales - Intermediate TB	Extended Flexible IFN-GAMMA test	2	110	0.1%	3	2.7%	102	92.7%	6	5.5%	5	4.5%	0	
	Parallel - Herd or Group Slaughter	6	536	0.5%	3	0.6%	394	73.5%	147	27.4%	138	25.7%	1	0.2%
	Parallel New Infection	76	7067	6.0%	142	2.0%	6526	92.3%	485	6.9%	354	5.0%	45	0.6%
	Parallel Persistent Infection	2	90	0.1%	21	23.3%	69	76.7%	1	1.1%	0		0	
	Parallel - Rapid Testing Two-times IRs	22	85	0.1%	22	25.9%	61	71.8%	2	2.4%	1	1.2%	1	1.2%
Wales - Low TB	Parallel New Infection	34	4014	3.4%	81	2.0%	3527	87.9%	326	8.1%	255	6.4%	151	3.8%
	Parallel - Other	1	2	0.0%	1	50.0%	1	50.0%	0		0		0	
	Parallel - Rapid Testing Two-times IRs	3	14	0.0%	2	14.3%	12	85.7%	0		0		0	
Wales		542	26623	22.5%	1052	4.0%	23044	86.6%	1894	7.1%	1473	5.5%	1054	4.0%
Scotland - Scotland	Parallel New Infection	22	1772	1.5%	120	6.8%	1541	87.0%	159	9.0%	111	6.3%	0	
	Parallel - Other	1	46	0.0%	39	84.8%	7	15.2%	1	2.2%	0		0	
Scotland		23	1818	1.5%	159	8.7%	1548	85.1%	160	8.8%	111	6.1%	0	

Table 5a. Summary of PM and culture results for IFNg positive animals.

Year	Month	Herds sampled	Samples tested	Herds with positives	IFNg+ samples	Wrong Eartags	No PM No Cult	No PM Cult Pend	No PM Cult Neg	No PM Cult Mb	No PM Cult Other	VL No Cult	VL Cult Neg	VL Cult Pend	VL Cult Mb	VL Cult Other	NVL No Cult	NVL Cult Pend	NVL Cult Neg	NVL Cult Mb	NVL Cult Other
2017	July	162	11556	81	437		1	0	0	0	0	33	3	0	2	0	324	0	70	0	3
	August	150	10915	97	560		1	0	0	0	0	23	0	0	5	0	439	1	74	0	3
	September	150	10922	94	664	2	10	0	0	0	0	30	1	0	1	0	564	0	56	0	0
	October	148	14754	96	971	7	8	0	0	0	0	50	1	0	4	0	862	0	38	0	0
	November	157	10666	108	961	2	24	0	0	0	0	87	3	0	8	0	800	0	31	1	0
	December	114	9478	81	668		43	0	0	0	0	29	2	0	1	0	562	0	28	1	1
2018	January	207	19678	140	969	5	3	0	0	0	0	80	1	8	5	2	756	24	84	0	0
	February	206	20791	130	1229	2	23	0	0	0	0	72	6	2	8	0	1075	1	35	0	4
	March	189	17292	131	1199	2	3	0	0	0	0	121	2	2	4	2	987	2	71	0	2
	April	195	20517	118	953	4	17	0	0	0	0	116	0	0	0	1	747	28	32	1	7
	May	250	21066	131	947	1	37	0	0	0	0	108	0	5	0	0	759	37	0	0	0
	June	187	18891	110	701	317	210	0	0	0	0	3	0	1	0	0	64	0	0	0	0
	Totals (last 12 months)	2115	186526	1317	10259	342	380	0	0	0	0	752	19	18	38	5	7939	93	519	3	20

Table 5b. Summary of culture results for IFNg positive animals (Samples received in last 12 months)

Country	Herds sampled	Samples tested	Herds with positives	IFNg+ samples	No PM No Cult	No PM Cult Pend	No PM Cult Neg	No PM Cult Mb	No PM Cult Other	VL No Cult	VL Cult Neg	VL Cult Pend	VL Cult Mb	VL Cult Other	NVL No Cult	NVL Cult Pend	NVL Cult Neg	NVL Cult Mb	NVL Cult Other
England	1055	140066	778	7812	246	0	0	0	0	671	11	7	27	1	6374	8	36	0	4
Scotland	33	2856	23	337	47	0	0	0	0	33	2	10	0	0	173	27	35	1	2
Wales	1027	43604	516	2110	87	0	0	0	0	48	6	1	11	4	1392	58	448	2	14
Totals	2115	186526	1317	10259	380	0	0	0	0	752	19	18	38	5	7939	93	519	3	20

Figure 4a. Number of herds sampled for IFNg and numbers of herds with any positive IFNg results.

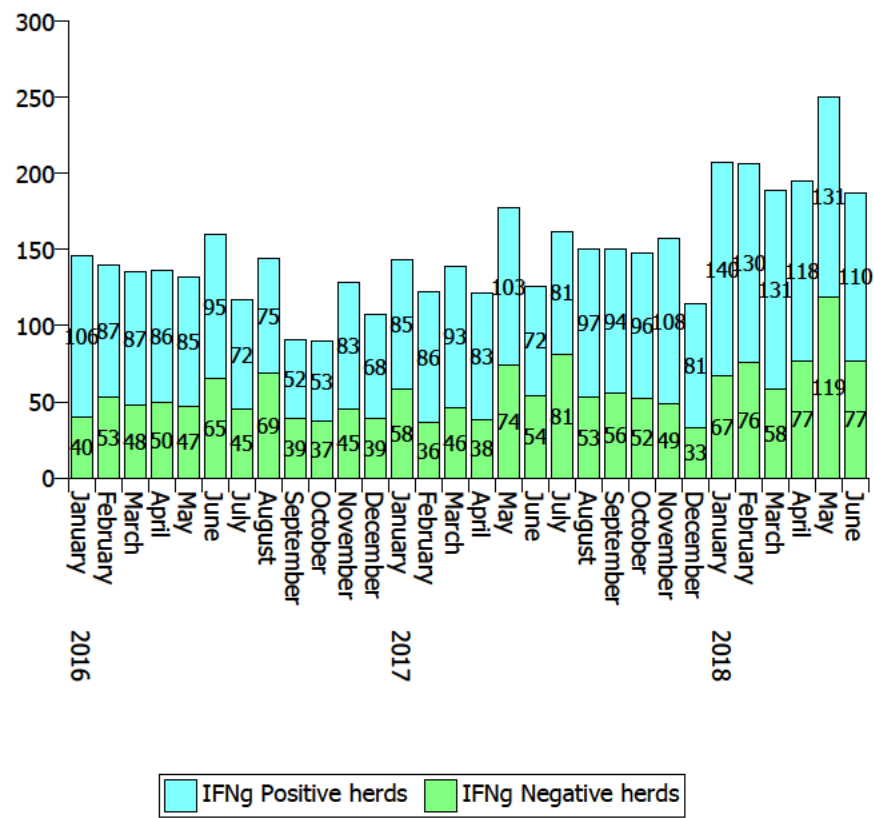
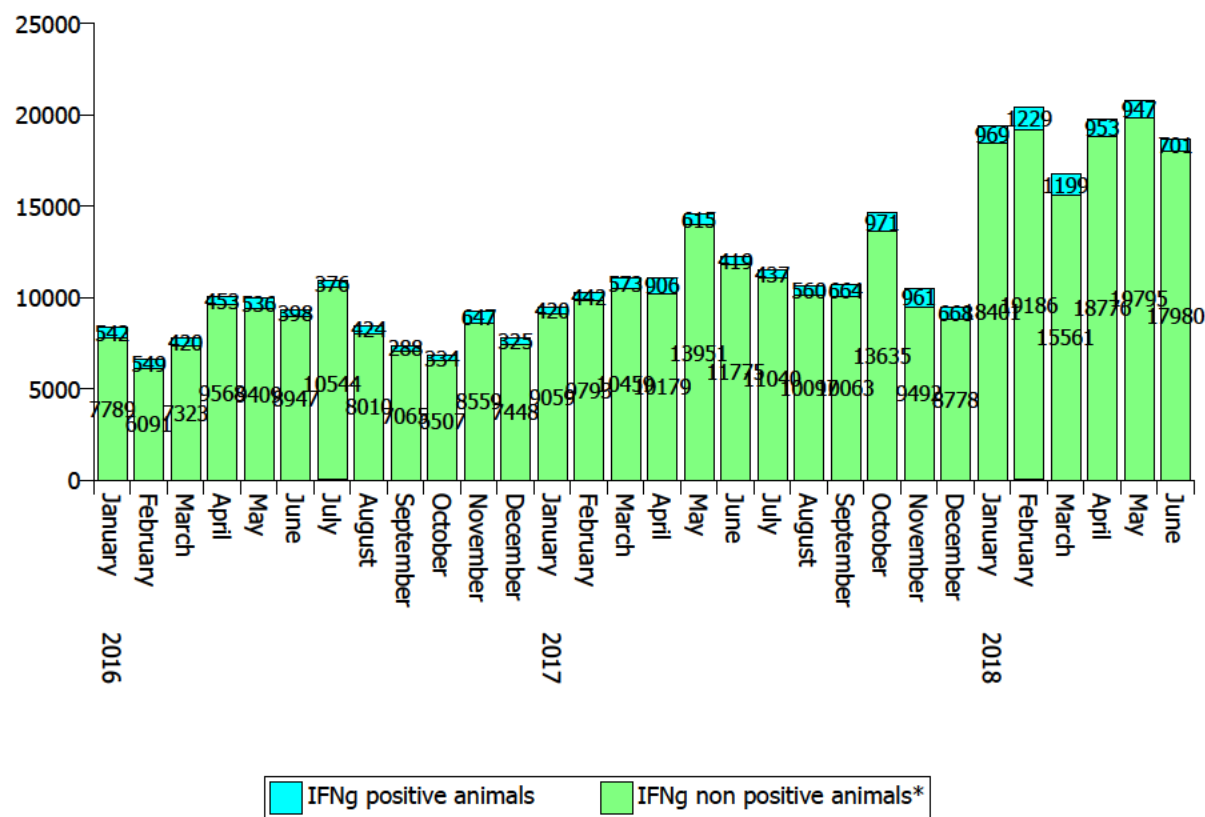


Figure 4b. Number of animals sampled for IFNg and numbers of animals with positive IFNg results.



*Includes all animals with IFNg test negative, resample and reject outcomes

Figure 5. Rates of resamples including the fail rates broken down for positive (POS) and negative (NEG) controls.

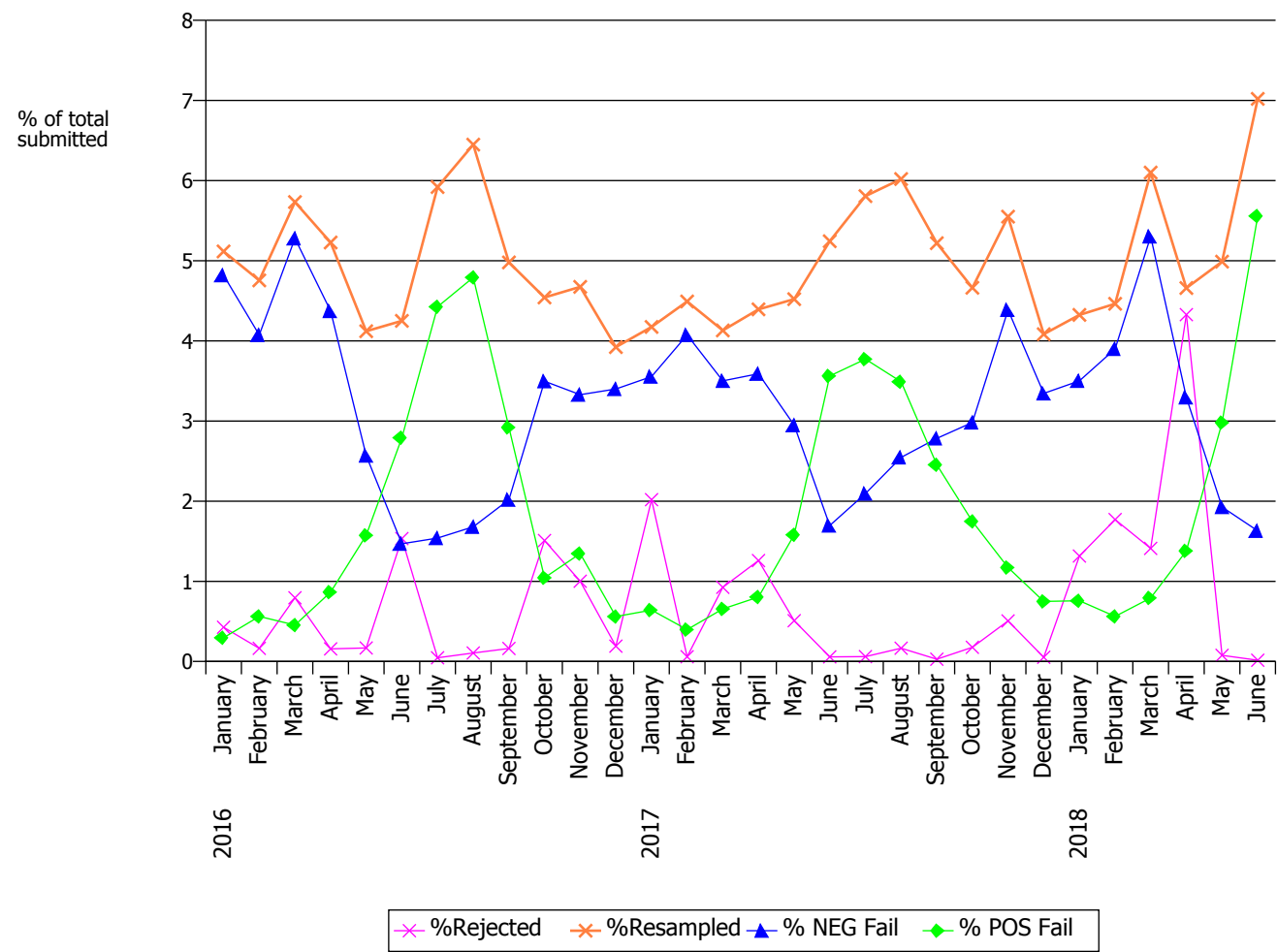
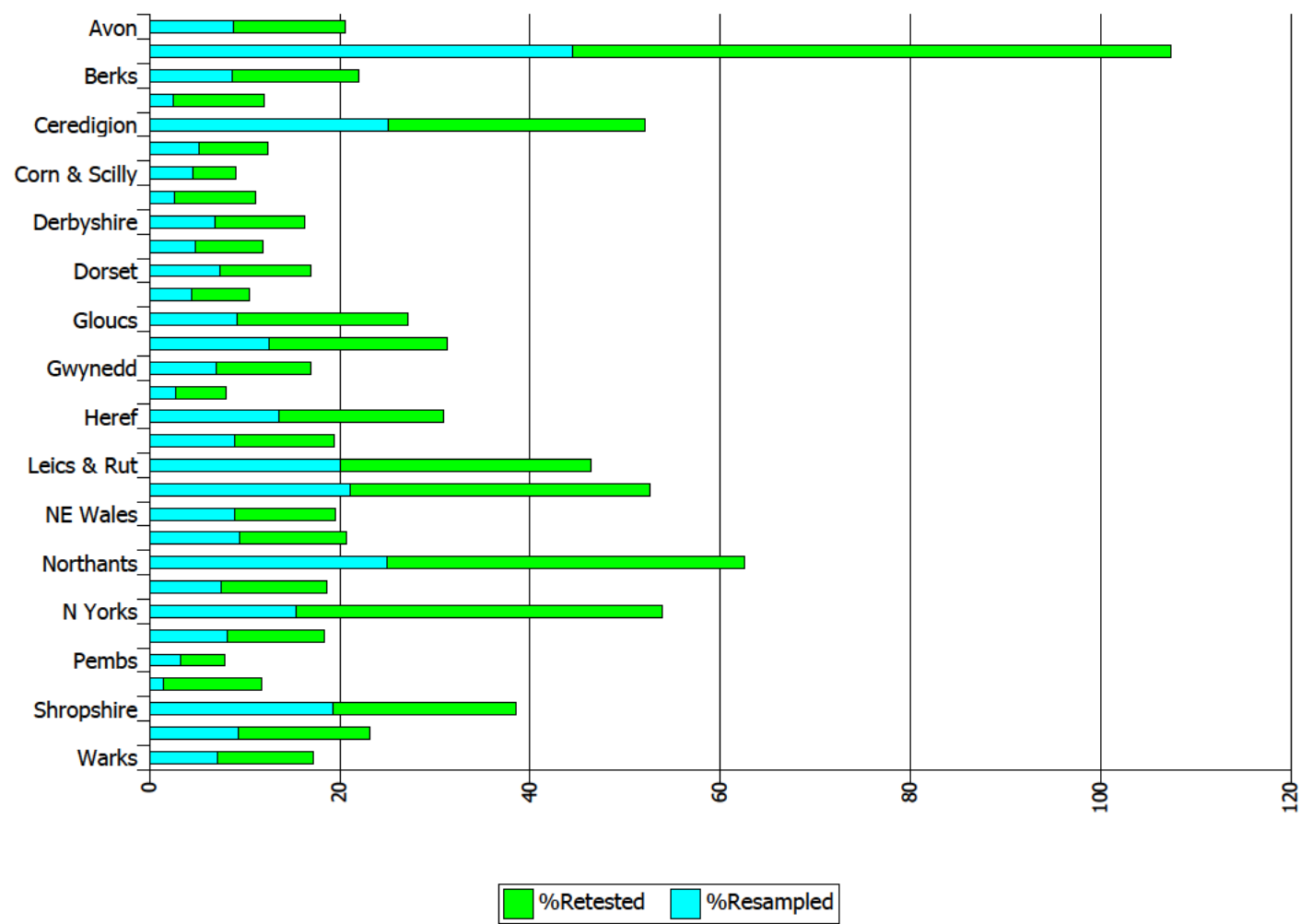


Figure 6. Proportion of samples retested, or requiring a resample, during June 2018 (% submission per County)



County	%Resampled	%Retested
Avon	8.82 %	11.76 %
Ayrshire	44.44 %	62.96 %
Berks	8.71 %	13.32 %
Carms	2.41 %	9.64 %
Ceredigion	25.05 %	27.01 %
Cheshire	5.13 %	7.29 %
Corn & Scilly	4.52 %	4.52 %
Cumbria	2.56 %	8.55 %
Derbyshire	6.84 %	9.49 %
Devon	4.76 %	7.14 %
Dorset	7.34 %	9.59 %
E Sussex	4.44 %	6.07 %
Gloucs	9.21 %	17.90 %
Gwent	12.50 %	18.75 %
Gwynedd	6.97 %	9.95 %
Hampshire	2.76 %	5.26 %
Heref	13.58 %	17.28 %
Herts	8.90 %	10.47 %
Leics & Rut	20.00 %	26.43 %
Lincs	21.05 %	31.58 %
NE Wales	8.95 %	10.59 %
Norfolk	9.44 %	11.21 %
Northants	25.00 %	37.50 %
Notts	7.54 %	11.11 %
N Yorks	15.38 %	38.46 %
Oxon	8.17 %	10.15 %
Pembs	3.24 %	4.65 %
Powys	1.38 %	10.34 %
Shropshire	19.23 %	19.23 %
Somerset	9.31 %	13.81 %
Warks	7.16 %	10.05 %

Table 6a (i): Number of animals and submissions tested in June 2018

Country	No. animals	No of IFHg+ animals	% Positive animals	No. samples	No of IFHg+ samples	% Positive samples
England	15360	580	3.8%	15519	580	3.7%
Wales	3294	121	3.7%	3345	121	3.6%
Scotland	27	0	0.0 %	27		0.0 %
GB	18681	701	3.8%	18891	701	3.7%

Table 6a (ii): Number of animals and submissions tested in June 2017

Country	No. animals	No of IFHg+ animals	% Positive animals	No. samples	No of IFHg+ samples	% Positive samples
England	8563	249	2.9%	8583	249	2.9%
Wales	3152	156	4.9%	3201	156	4.9%
Scotland	479	14	2.9%	479	14	2.9%
GB	12194	419	3.4%	12263	419	3.4%

Table 6b (i): Number of animals and submissions tested in 2018 Up to end of June

Country	No. animals	No of IFHg+ animals	% Positive animals	No. samples	No of IFHg+ samples	% Positive samples
England	82251	4787	5.8%	89794	4787	5.3%
Wales	24567	1052	4.3%	26623	1052	4.0%
Scotland	1691	159	9.4%	1818	159	8.7%
GB	108498	5998	5.5%	118235	5998	5.1%

Table 6b (ii): Number of animals and submissions tested in 2017 Up to end of June

Country	No. animals	No of IFHg+ animals	% Positive animals	No. samples	No of IFHg+ samples	% Positive samples
England	41848	2069	4.9%	48257	2069	4.3%
Wales	17192	1256	7.3%	18679	1256	6.7%
Scotland	2179	50	2.3%	2229	50	2.2%
GB	61217	3375	5.5%	69165	3375	4.9%

Table 7a Number of private samples June 2018

	* Test type	Num Submissions	Num Sample	Num Positives Private	% Positive
Cheshire	PRV-SP	1	1		0
	Total	1	1		0

Table 7b Number of private samples 2018

	* Test type	Num Submissions	Num Samples	Num Positives Private	% Positive
Buckinghamshire	PRV-SE	1	1		0
Cheshire	PRV-SP	1	1		0
Isle of Man	SER-IOM	9	22		0
Northern Somerset & South Glou	PRV-SE	2	46	8	17.39 %
Oxfordshire	PRV-SE	1	38	4	10.53 %
Somerset excl North	PRV-SE	2	45	3	6.67 %
	PRV-SP	1	1		0
Suffolk	PRV-SP	2	11		0
	Total	19	165	15	9.09 %

*SER-IOM: Serial High Specificity test – Isle of Man; PRV-SE: Private High Sensitivity test - England;
PRV-SP: Private High Specificity test – England

Table 8a Number of Cattle Antibody Tests June 2018

Test	County	Num Submissions	Num Samples Tested	Num Positive Samples	% Positive
TC0077	Pembrokeshire	1	164	3	1.8 %
TC0077		Sum:	164	3	1.8 %

Table 8b Number of Cattle Antibody Tests 2018

Test	County	Num Submissions	Num Samples Tested	Num Positive Samples	% Positive
TC0077	Carmarthenshire	1	125	2	1.6 %
	Ceredigion	1	85	4	4.7 %
	Pembrokeshire	1	164	3	1.8 %
TC0077		Sum:	374	9	2.4 %