

**EXPERTISE AND SERVICE PROVISION
QUALITY OF LABORATORIES**

**EXTERNAL QUALITY ASSESSMENT
IN VETERINARY DIAGNOSIS**

DEFINITIVE GLOBAL REPORT

**Proficiency Testing in Veterinary Diagnosis
Blue Tongue Virus (BTV)**

SURVEY 2020/8

Sciensano/PT VET BTV/1-E

Expertise and service provision
Quality of laboratories
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Authorization to release the report:

By Bernard China, scheme coordinator, on 27/10/2020.



All the reports are also available on our webpage:

https://www.wiv-isp.be/QML/activities/PT%20VET/fr/originaux/rapports_annee.htm

https://www.wiv-isp.be/QML/activities/PT%20VET/nl/originaux/rapports_annee.htm

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Introduction

This survey was dedicated to the detection of antibodies specific to Blue Tongue Virus in serum using ELISA.

The samples

The samples were prepared by the National Reference Laboratory, Exotic viruses and particular diseases, Infectious diseases in animals Directorate, Sciensano. Six reference serum samples of bovidae origin, either free from detectable BTV-specific antibodies (n=2; coded 'PT2020BLTSERNS1' and 'PT2020BLTSERNS2') or containing detectable BTV-specific antibodies (n=4; coded 'PT2020BLTSERPS1', 'PT2019BLTSERPS2', 'PT2020BLTSERPS4' and 'PT2020BLTSERPS5'), were used. In total, 50 aliquots were distributed to 5 participating laboratories. All participants received 10 aliquots: 2 aliquots of the reference samples PT2020BLTSERNS1, PT2020BLTSERPS1, PT2020BLTSERPS4 and PT2020BLTSERPS5 and 1 aliquot of the reference samples PT2020BLTSERNS2 and PT2020BLTSERPS2.

For each reference serum sample, a certificate containing the status of the sample (= 'golden standard') was made. The status of the reference serum samples was based on (i) the historical background of the animals and (ii) the results obtained during pre-verification, hereby using the ID Screen® Bluetongue Competition kit from ID.VET.

Table S1. Overview of the reference samples

| Sample ID | Origine | Background | Status |
|------------------------|----------------|-------------------------|---------------|
| PT2020BLTSERNS1 | bovine | Uninfected/unvaccinated | negative |
| PT2020BLTSERNS2 | ovine | Uninfected/unvaccinated | negative |
| PT2020BLTSERPS1 | ovine | vaccinated | positive |
| PT2020BLTSERPS2 | ovine | vaccinated | positive |
| PT2020BLTSERPS4 | bovine | vaccinated | positive |
| PT2020BLTSERPS5 | bovine | vaccinated | positive |

Homogeneity

The homogeneity of the samples were tested by the NRL before the survey on 10 replicates. The samples were considered as homogeneous.

Target Values

The target value was determined by the NRL based on the homogeneity tests. PT2020BLTSERNS1, PT2020BLTSERNS2 are negative
PT2020BLTSERPS1, PT2020BLTSERPS2, PT2020BLTSERPS4 and PT2020BLTSERPS5 are positive

Stability

The stability was determined by comparison of the pre-survey results and the results obtained by the NRL during and after the survey. The samples were considered as stable.

The participants

5 laboratories participated to the IBR Virology survey:
Sciensano ; Arsia (Ciney) , DGZ (Torhout), Lavetan, LMVE (Luxemburg)

Threshold for qualification

Following the procedure, a participating laboratory is only qualified if the level of agreement for the 20 reference samples is at least 90%.

Randomisation and panel composition

Since a specific number has been assigned to each laboratory, the randomisation has been performed as follow:

| | Group 1 97506, 97508 and 97516 | Group 2 97507 and 97509. |
|---------------------|---|-------------------------------------|
| Sample Order | | |
| BTVSERB2001 | PT2020BLTSERNS1 | PT2020BLTSERPS1 |
| BTVSERB2002 | PT2020BLTSERNS1 | PT2020BLTSERPS1 |
| BTVSERB2003 | PT2020BLTSERNS2 | PT2020BLTSERPS2 |
| BTVSERB2004 | PT2020BLTSERPS1 | PT2020BLTSERPS4 |
| BTVSERB2005 | PT2020BLTSERPS1 | PT2020BLTSERPS4 |
| BTVSERB2006 | PT2020BLTSERPS2 | PT2020BLTSERPS5 |
| BTVSERB2007 | PT2020BLTSERPS4 | PT2020BLTSERPS5 |
| BTVSERB2008 | PT2020BLTSERPS4 | PT2020BLTSERNS2 |
| BTVSERB2009 | PT2020BLTSERPS5 | PT2020BLTSERNS1 |
| BTVSERB2010 | PT2020BLTSERPS5 | PT2020BLTSERNS1 |

The panel was constituted of 10 samples of 500 µl.

Survey Timeline

Transfer of the samples from NRL to QL: 18/06/2020

Randomization of the samples by QL: 7 and 19/06/2020

sending samples to participants: 22/06/2020. The samples were sent on dry ice.

Deadline for the results encoding: 17/07/2020

Preliminary report: 22/07/2020

Results

Results per sample

5 laboratories encoded results, 4 encoded one dataset and 1 encoded 2 datasets giving 6 datasets.

Table R1. Results per sample

| Sample ID | Expected result | Number of repetitions (total results) | Observed result |
|------------------------|------------------------|--|------------------------|
| PT2020BLTSERNS1 | Negative | 2 (12) | 12 negative results |
| PT2020BLTSERNS2 | Negative | 1 (6) | 6 negative results |
| PT2020BLTSERPS1 | Positive | 2 (12) | 12 positive results |
| PT2020BLTSERPS2 | Positive | 1 (6) | 6 positive results |
| PT2020BLTSERPS4 | Positive | 2 (12) | 12 positive results |
| PT2020BLTSERPS5 | Positive | 2 (12) | 12 positive results |

Globally, on 60 encoded results, 100% were correct.

1.1.Used methods

Table R2. Results per method

| Method | N |
|---|----------|
| ID Screen Bluetongue Competition | 5 |
| IDEXX Bluetongue competition (VP7) Ab test | 1 |
| Total | 6 |

Conclusion

According to the procedure currently in force, the performance of a participating laboratory is satisfactory if at least 90% of the results provided by this laboratory is in agreement with the status of the reference samples assigned by the BTV reference laboratory of the Scientific Directorate Infectious Diseases in Animals of Sciensano. Consequently, all participants achieved a satisfactory performance for the detection of BTV-specific antibodies in reference serum samples.

ANNEXES

Annex 1. Quantitative data for BTV serology

Sample PT2020BLTSERNS1

Table A1. Quantitative normalized values (%)

| Lab ID | L97506 | L97507 | L95708 | L97508 | L97509 | L97516 |
|--------|----------------------------------|--------|--|----------------------------------|--------|--------|
| Method | ID Screen Bluetongue Competition | | IDEXX Bluetongue competition (VP7) Ab test | ID Screen Bluetongue Competition | | |
| R1 | 107.74 | 120.70 | 116.71 | 113.65 | 113.69 | 115.30 |
| R2 | 110.43 | 123.18 | 116.87 | 110.03 | 112.09 | 111.71 |
| Mean | 109.08 | 121.94 | 116.79 | 111.84 | 112.89 | 113.51 |
| SD | 1.90 | 1.75 | 0.11 | 2.56 | 1.13 | 2.54 |
| CV (%) | 1.75% | 1.43% | 0.10% | 2.29% | 1.00% | 2.23% |

Rn: repetition n

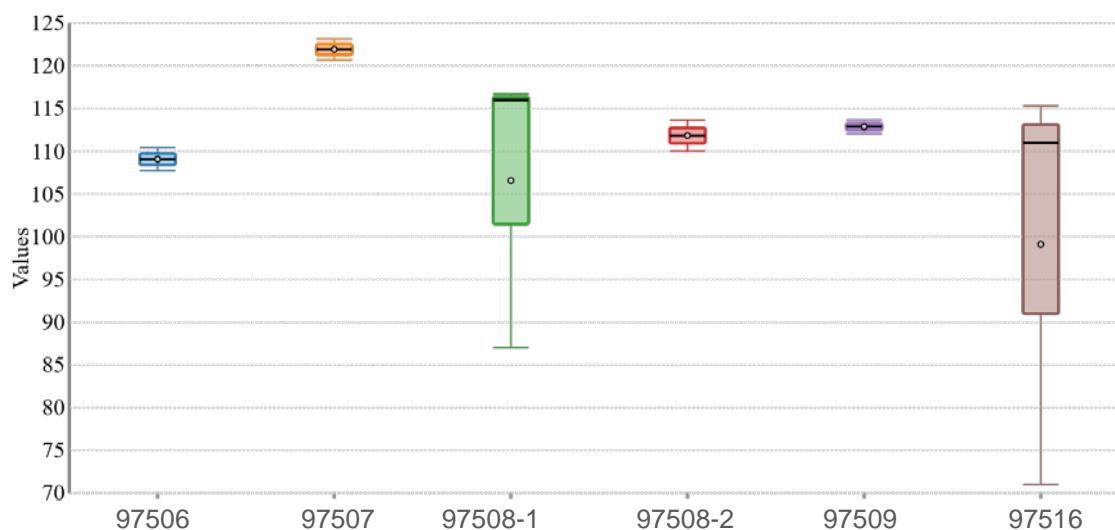


Figure A1. Boxplot dispersion of the results per participant for the sample PT2020BLTSERNS1

Sample PT2020BLTSERPS1

Table A2. Quantitative normalized values (%)

| Lab ID | L97506 | L97507 | L95708 | L97508 | L97509 | L97516 |
|--------|----------------------------------|--------|--|----------------------------------|--------|--------|
| Method | ID Screen Bluetongue Competition | | IDEXX Bluetongue competition (VP7) Ab test | ID Screen Bluetongue Competition | | |
| R1 | 6.02 | 8.59 | 25.41 | 7.53 | 4.69 | 11.35 |
| R2 | 6.70 | 9.05 | 24.93 | 7.36 | 4.53 | 10.03 |
| Mean | 6.36 | 8.82 | 25.17 | 7.44 | 4.61 | 10.69 |
| SD | 0.49 | 0.32 | 0.34 | 0.12 | 0.12 | 0.93 |
| CV (%) | 7.64% | 3.65% | 1.35% | 1.64% | 2.54% | 8.72% |

R1: repetition 1, R2: repetition 2

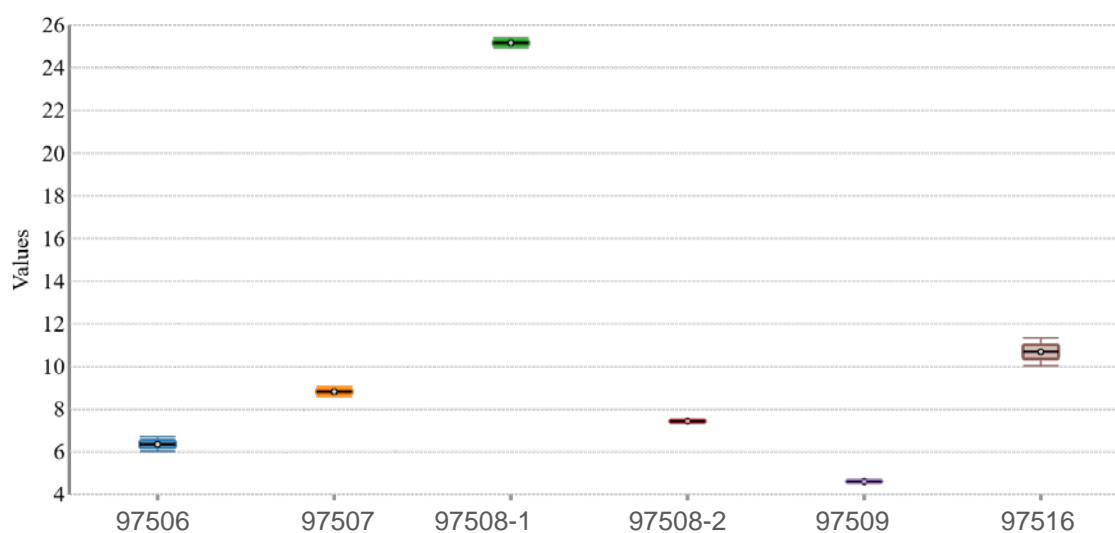


Figure A2. Boxplot distribution of the values (%) per participant

Sample PT2020BLTSERPS4

Table A3. Quantitative normalized results (%)

| Lab ID | L97506 | L97507 | L95708 | L97508 | L97509 | L97516 |
|--------|----------------------------------|--------|--|----------------------------------|--------|--------|
| Method | ID Screen Bluetongue Competition | | IDEXX Bluetongue competition (VP7) Ab test | ID Screen Bluetongue Competition | | |
| R1 | 4.13 | 8.20 | 18.92 | 4.89 | 3.92 | 6.30 |
| R2 | 4.41 | 8.27 | 16.99 | 4.60 | 4.14 | 7.17 |
| Mean | 4.27 | 8.24 | 17.96 | 4.74 | 4.03 | 6.73 |
| SD | 0.20 | 0.05 | 1.36 | 0.20 | 0.16 | 0.62 |
| CV (%) | 4.75% | 0.56% | 7.58% | 4.29% | 3.87% | 9.22% |

R1: repetition 1, R2: repetition 2

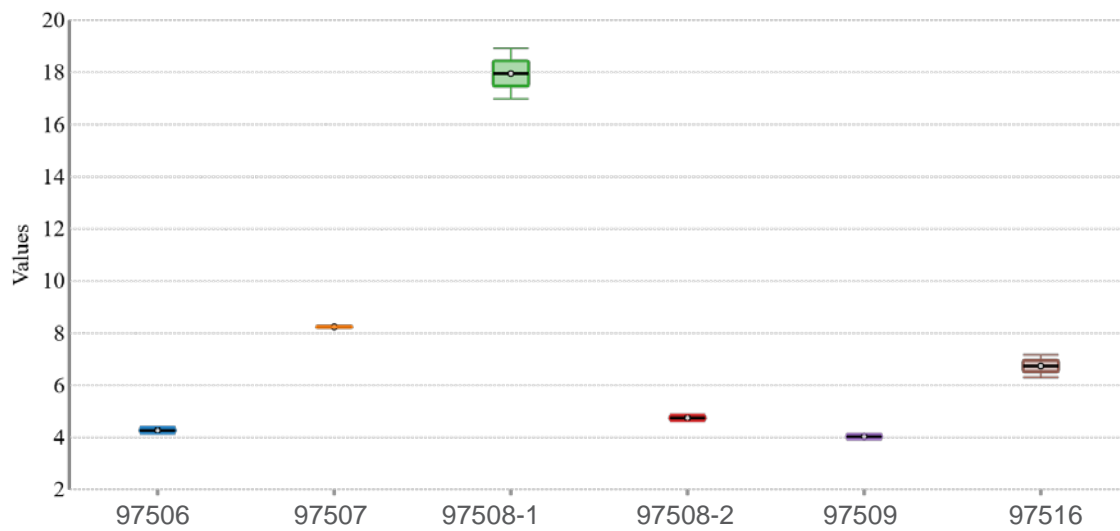


Figure A3. Boxplot dispersion of the values (%) per participant

Sample PT2020BLTSERPS5

Table A4. Quantitative normalized values (%)

| Lab ID | L97506 | L97507 | L95708 | L97508 | L97509 | L97516 |
|--------|----------------------------------|--------|--|----------------------------------|--------|--------|
| Method | ID Screen Bluetongue Competition | | IDEXX Bluetongue competition (VP7) Ab test | ID Screen Bluetongue Competition | | |
| R1 | 15.24 | 8.20 | 18.92 | 4.89 | 3.92 | 6.30 |
| R2 | 15.19 | 8.27 | 16.99 | 4.60 | 4.14 | 7.17 |
| Mean | 15.21 | 8.24 | 17.96 | 4.74 | 4.03 | 6.73 |
| SD | 0.04 | 0.05 | 1.36 | 0.20 | 0.16 | 0.62 |
| CV (%) | 0.27% | 0.56% | 7.58% | 4.29% | 3.87% | 9.22% |

R1: repetition 1, R2: repetition 2.

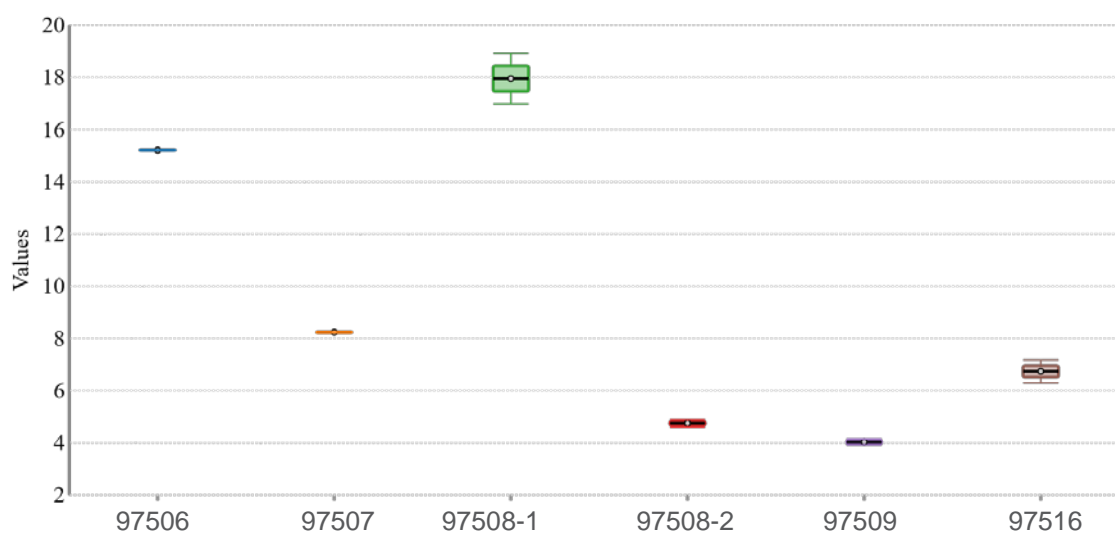


Figure A4. Boxplot dispersion of the values (%) per participant

Annex 2: additional information

PRELIMINARY REPORT

The preliminary report of this survey is available on our website via the following link:

https://www.wiv-isp.be/QML/activities/PT%20VET/fr/originaux/rapports_annee.htm

The calendar for Proficiency Testing in Veterinary diagnosis is available on our website:

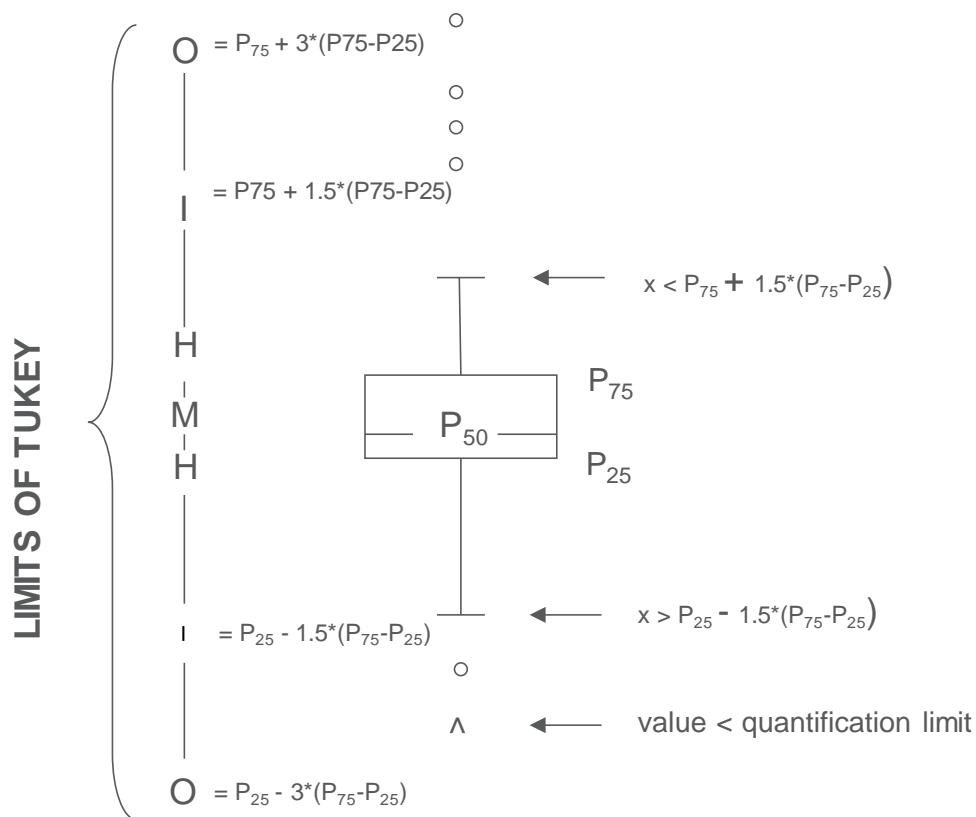
The link is:

https://www.wiv-isp.be/QML/activities/external_quality/calendar/calender_PT%20VET/ fr/Calendrier_2020-PT%20VET%202.htm

Graphical representation

Besides the tables with the results a "Box and whisker" plot is added. It contains the following elements for the methods with at least 6 participants:

- a rectangle ranging from percentile 25 (P_{25}) to percentile 75 (P_{75})
- a central line representing the median of the results (P_{50})
- a lower limit showing the smallest value $x > P_{25} - 1.5 * (P_{75} - P_{25})$
- an upper limit representing the largest value $x < P_{75} + 1.5 * (P_{75} - P_{25})$
- all points outside this interval are represented by a dot.



Corresponding limits in case of normal distribution

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