

EXPERTISE AND SERVICE PROVISION  
QUALITY OF LABORATORIES

EXTERNAL QUALITY ASSESSMENT  
IN VETERINARY DIAGNOSIS

**DEFINITIVE GLOBAL REPORT**

**Proficiency Testing in Veterinary Diagnosis  
Infectious Bovine Rhinotracheitis (IBR)**

**SURVEY 2020/4**

**Corrected Version**

**Sciensano/PT VET IBR/1-E-CV**

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**Modifications**

Page 4: IDEXX instead of ID-VET

Page 7: modifications in table R2 and Conclusion added

Page 8: conclusion added

Table A5 to table A9: the used methods were corrected

**Authorization to release the report:**By Bernard China, scheme coordinator, on  
15/01/2021.


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/fr/originaux/rapports_annee.htm)  
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## **Introduction**

This survey was dedicated to the detection of antibodies specific to IBR virus in bovine serum using ELISA, gB and gE specific ELISA were evaluated.

## **The samples**

The samples were prepared by the National Reference Laboratory, Enzootic, vector-borne and bee diseases, Infectious diseases in animals Directorate, Sciensano.

### **gB Serology**

#### **Homogeneity**

For gB ELISA, 4 different samples were used: PT2020SER IBRgBNS1 ; PT2020SER IBRgBPS1 ; PT2020SER IBRgBPS2 and PT2020SER IBRgBPS3

PT2020IBRgBPS1, PT2020ASFVIRPS2, PT2020ASFVIRNS3.

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

#### **Target Values**

The target value was determined by the NRL based on the homogeneity tests.  
PT2020SER IBRgBNS1 is negative.  
PT2020SER IBRgBPS1 ; PT2020SER IBRgBPS2 and PT2020SER IBRgBPS3 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**

9 laboratories participated to the IBR Virology survey:  
Sciensano ; Arsia (Ciney) , DGZ (Torhout), Lavetan, Anses (Niort), LMVE (Luxemburg), Biosellal (France), [IDEXX](#) (Switzerland), Hipra (Espagne).

## Randomisation and panel composition

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

	<b>Group 1 97505, 97507, 97509, 97514, 97516, 97518, 97521.</b>	<b>Group 2 97508 and 97513.</b>
<b>Sample Order</b>		
<b>IBRgB2001</b>	PT2020SER IBRgBPS1	PT2020SER IBRgBNS1
<b>IBRgB2002</b>	PT2020SER IBRgBPS2	PT2020SER IBRgBPS1
<b>IBRgB2003</b>	PT2020SER IBRgBPS1	PT2020SER IBRgBNS1
<b>IBRgB2004</b>	PT2020SER IBRgBPS2	PT2020SER IBRgBPS2
<b>IBRgB2005</b>	PT2020SER IBRgBPS3	PT2020SER IBRgBNS1
<b>IBRgB2006</b>	PT2020SER IBRgBPS2	PT2020SER IBRgBPS1
<b>IBRgB2007</b>	PT2020SER IBRgBPS3	PT2020SER IBRgBNS1
<b>IBRgB2008</b>	PT2020SER IBRgBPS2	PT2020SER IBRgBPS2
<b>IBRgB2009</b>	PT2020SER IBRgBPS3	PT2020SER IBRgBPS3
<b>IBRgB2010</b>	PT2020SER IBRgBPS3	PT2020SER IBRgBPS2
<b>IBRgB2011</b>	PT2020SER IBRgBPS3	PT2020SER IBRgBPS3
<b>IBRgB2012</b>	PT2020SER IBRgBPS3	PT2020SER IBRgBPS2
<b>IBRgB2013</b>	PT2020SER IBRgBPS3	PT2020SER IBRgBPS3
<b>IBRgB2014</b>	PT2020SER IBRgBPS3	PT2020SER IBRgBPS3
<b>IBRgB2015</b>	PT2020SER IBRgBPS3	PT2020SER IBRgBPS3
<b>IBRgB2016</b>	PT2020SER IBRgBPS3	PT2020SER IBRgBPS3
<b>IBRgB2017</b>	PT2020SER IBRgBNS1	PT2020SER IBRgBPS3
<b>IBRgB2018</b>	PT2020SER IBRgBNS1	PT2020SER IBRgBPS3
<b>IBRgB2019</b>	PT2020SER IBRgBNS1	PT2020SER IBRgBPS3
<b>IBRgB2020</b>	PT2020SER IBRgBNS1	PT2020SER IBRgBPS3

The panel was constituted of 20 samples of 250 ul.

## **2. gE serology**

### Homogeneity

5 different samples were used: PT2020SER IBRgENS1 ; PT2020SER IBRgENS2; PT2020SER IBRgENS3; PT2020SER IBRgEPS1 and PT2020SER IBRgEPS2.

The homogeneity of the samples were tested by the NRL on 10 exemplars of each sample.

The samples were considered as homogeneous.

### The participants

8 laboratories participated to the IBR gE Serology survey: Sciensano, Arsia (Ciney), DGZ (Torhout), Lavetan, Anses (Niort), LMVE (Luxemburg), Hipra (Espagne), Idexx (Suisse).

### Target values

The target values were determined by the NRL using the homogeneity results.

PT2020SER IBRgENS1, PT2020SER IBRgENS2 and PT2020SER IBRgENS3 are considered as negative. PT2020SER IBRgEPS1 and PT2020SER IBRgEPS2 are considered as positive.

## Stability

The samples were tested before, during and after the survey. The results were compared and the samples were considered as stable.

## Randomisation and panel composition

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

Laboratory	Group 1 97505, 97507, 97509, 97513, 97516, 97518 and 97521	Group 2 97508 and 97513
Sample Order		
IBRgE2001	PT2020SER IBRgENS1	PT2020SER IBRgEPS1
IBRgE2002	PT2020SER IBRgENS3	PT2020SER IBRgEPS1
IBRgE2003	PT2020SER IBRgENS1	PT2020SER IBRgEPS2
IBRgE2004	PT2020SER IBRgENS3	PT2020SER IBRgEPS1
IBRgE2005	PT2020SER IBRgENS2	PT2020SER IBRgEPS1
IBRgE2006	PT2020SER IBRgENS3	PT2020SER IBRgEPS2
IBRgE2007	PT2020SER IBRgENS2	PT2020SER IBRgEPS1
IBRgE2008	PT2020SER IBRgENS3	PT2020SER IBRgEPS1
IBRgE2009	PT2020SER IBRgEPS1	PT2020SER IBRgEPS2
IBRgE2010	PT2020SER IBRgEPS1	PT2020SER IBRgEPS1
IBRgE2011	PT2020SER IBRgEPS2	PT2020SER IBRgEPS1
IBRgE2012	PT2020SER IBRgEPS1	PT2020SER IBRgEPS2
IBRgE2013	PT2020SER IBRgEPS1	PT2020SER IBRgENS1
IBRgE2014	PT2020SER IBRgEPS2	PT2020SER IBRgENS2
IBRgE2015	PT2020SER IBRgEPS1	PT2020SER IBRgENS3
IBRgE2016	PT2020SER IBRgEPS1	PT2020SER IBRgENS2
IBRgE2017	PT2020SER IBRgEPS2	PT2020SER IBRgENS3
IBRgE2018	PT2020SER IBRgEPS2	PT2020SER IBRgENS3
IBRgE2019	PT2020SER IBRgEPS1	PT2020SER IBRgENS3
IBRgE2020	PT2020SER IBRgEPS1	PT2020SER IBRgENS1

The IBRgE serology panel consisted of 20 serum samples of 250 ul.

## **Survey Timeline**

Transfer of the samples from NRL to QL: 07/05/2020  
Randomization of the samples by QL: 7 and 08/05/2020  
sending samples to participants: 11/05/2020. The samples were sent on dry ice.  
Deadline for the results encoding: 30/06/2020  
Preliminary report: 10/07/2020

## Results

### 1.gB serology

#### 1.1.Results per sample

9 laboratories encoded results giving 9 datasets.

Table R1. Results per sample

Sample ID	Expected result	Number of repetitions (total results)	Observed result
PT2020SER IBRgBNS1	Negative	4 (36)	36 negative results
PT2020SER IBRgBPS1	Positive	3 (27)	27 positive results
PT2020SER IBRgBPS2	Positive	5 (45)	45 positive results
PT2020SER IBRgBPS3	Positive	10 (90)	90 positive results

Globally, on 180 encoded results, 100% were correct.

#### 1.2.Used methods

Table R2. Results per method

Method	N	NR	NCR	%
IDEXX IBR(BHV1) gB Antibody test kit X3	7	140	140	100
Biosella BioLisa kit IBR gB Ab	1	20	20	100
Hipra CIVTEST SUIS IBRgB	1	20	20	100
<b>Total</b>	<b>9</b>	<b>180</b>	<b>180</b>	<b>100</b>

NR: number of results, NCR: Number of correct results.

#### 1.3.Conclusion

All the participants gave correct results independently of the used method.

## 2. Serology gE

The Serology gE is used to determine the vaccine status of the animal.

### 2.1. Results per sample

8 laboratories encoded results. Two laboratories encoded 2 datasets. 10 datasets were encoded.

Table R3. Result per sample

Sample	Expected result	Number of repetition	Observed result
PT2020SER IBRgENS1	Negative	2	40 Negative
PT2020SER IBRgENS2	Negative	2	40 Negative
PT2020SER IBRgENS3	Negative	4	80 Negative
PT2020SER IBRgEPS1	Positive	8	160 Positive
PT2020SER IBRgEPS2	Positive	4	80 Negative

On the 200 encoded results, 100% were correct.

### 2.2. Used methods

Table R4. Used methods

Method	N
IDEXX IBR gE Ab test	7
ID Screen gE Competition	2
Hipra CIVTEST SUIS IBR gE	1

### 2.3. Conclusion

All the participants encoded correct results independently of the used method.



**ANNEXES (not under accreditation)**

**Annex 1. Quantitative data for gB serology**

Sample PT2020SER IBRgB NS1

Table A1. Quantitative normalized values (%)

Lab ID	L97505	L97507	L95708	L97509	L97513	L97514	L97516	L97518	L97521
Method	IDEXX-IBR(BHV1) gB Antibody test kit X3					BioLisa kit IBR gB Ab	IDEXX-IBR(BHV1) gB Antibody test kit X3	CIVTEST SUIS IBRgB	IDEXX-IBR(BHV1) gB Antibody test kit X3
R1	-2.282	6.597	15.201	14.555	13.764	-4.716	7.805	2.378	4.037
R2	1.807	6.829	0.549	8.048	-0.209	-9.880	23.512	-2.447	0.928
R3	5.087	9.722	5.128	7.363	-1.981	-7.260	26.634	-2.723	3.387
R4	8.846	3.241	3.114	0.856	-1.668	-7.410	-3.122	-12.651	3.387
Mean	3.364	6.597	5.998	7.705	2.477	-7.317	13.707	-3.861	2.935
SD	4.737	2.651	6.415	5.599	7.565	2.109	13.920	6.311	1.372
CV (%)	140.796	40.185	106.954	72.668	305.457	-28.831	101.551	-163.465	46.766

R1: repetition 1

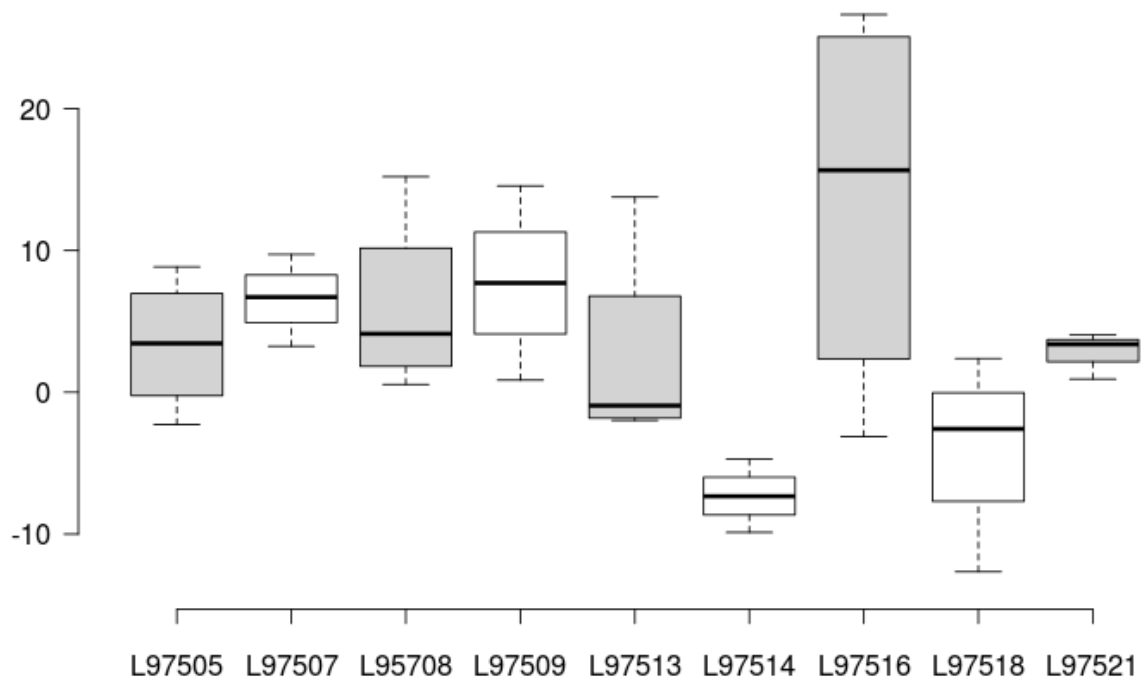


Figure A1. Boxplot dispersion of the results per participant for the sample gBNS1

Sample PT2020SERIBRgB\_PS1

Table A2. Quantitative normalized values (%)

Lab ID	L97505	L9507	L97508	L95709	L97513	L97514	L97516	L97518	L97521
Method	IDEXX-IBR(BHV1) gB Antibody test kit X3					BioLisa kit IBR gB Ab	IDEXX- IBR(BHV1) gB Antibody test kit X3	CIVTEST SUIS IBRgB	IDEXX- IBR(BHV1) gB Antibody test kit X3
R1	98.254	98.611	98.993	94.178	94.265	95.584	97.659	95.726	94.385
R2	98.335	98.264	98.535	94.863	91.032	95.584	97.561	95.932	94.478
Mean	98.295	98.437	98.764	94.521	92.649	95.58383	97.610	95.829	94.431
SD	0.057	0.2456	0.324	0.484	2.286	0	0.069	0.146	0.066
CV(%)	0.058	0.249	0.328	0.512	2.467	0	0.071	0.153	0.070

R1: repetition 1, R2: repetition 2

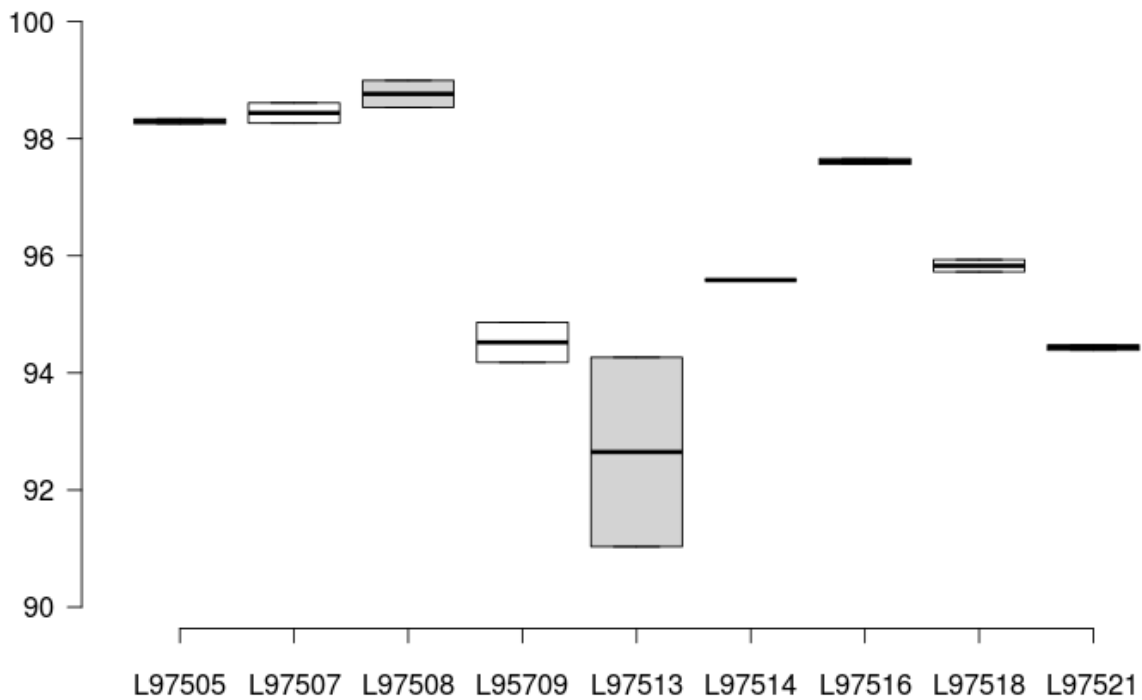


Figure A2. Boxplot distribution of the values (%) per participant

## Sample PT2020SERIBRgB PS2

Table A3. Quantitative normalized results (%)

Lab ID	L97505	L97507	L95708	L97509	L97513	L97514	L97516	L97518	L97521
Method	IDEXX-IBR(BHV1) gB Antibody test kit X3					BioLisa kit IBR gB Ab	IDEXX-IBR(BHV1) gB Antibody test kit X3	CIVTEST SUIS IBRgB	IDEXX-IBR(BHV1) gB Antibody test kit X3
R1	98.124	98.380	98.810	94.692	94.995	95.509	98.049	94.760	94.524
R2	98.283	98.611	98.993	95.034	94.369	95.659	98.244	95.036	94.896
R3	98.360	98.495	98.443	94.435	94.891	95.734	97.756	94.898	94.803
R4	98.275	98.611	98.626	94.521	94.891	95.584	97.951	93.864	95.406
Mean	98.260	98.524	98.718	94.670	94.786	95.621	98.000	94.640	94.907
SD	0.098	0.111	0.236	0.265	0.282	0.097	0.203	0.529	0.368
CV (%)	0.100	0.112	0.240	0.280	0.298	0.101	0.207	0.559	0.388

R1: repetition 1

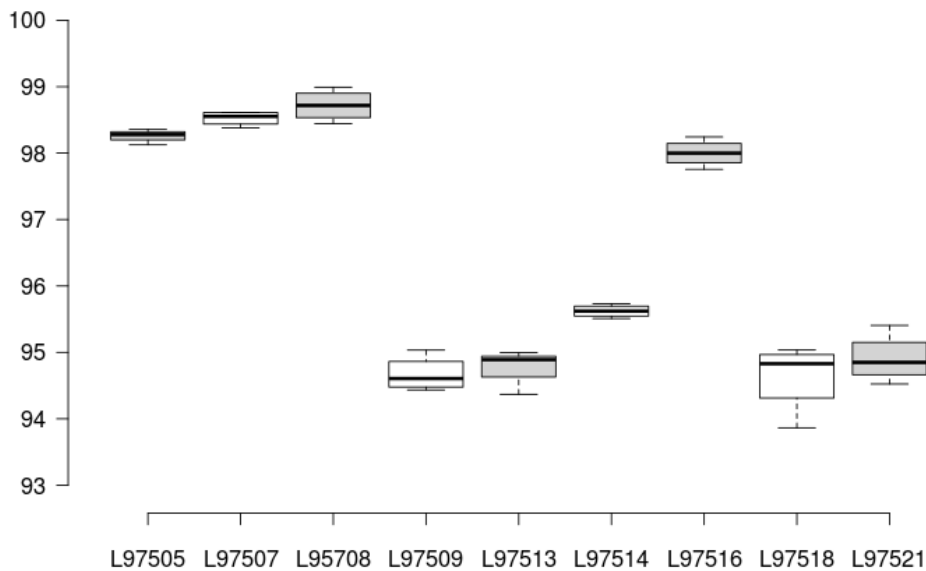


Figure A3. Boxplot dispersion of the values (%) per participant

Sample PT2020SERIBRgB PS3

Table A4. Quantitative normalized values (%)

Lab ID	L97505	L97507	L97508	L97509	L97513	L97514	L97516	L97518	L97521
Method	IDEXX-IBR(BHV1) gB Antibody test kit X3					BioLisa kit IBR gB Ab	IDEXX-IBR(BHV1) gB Antibody test kit X3	CIVTEST SUIS IBRgB	DEXX-IBR(BHV1) gB Antibody test kit X3
R1	98.068	98.264	98.810	94.264	94.056	95.509	97.463	93.175	94.014
R2	98.088	97.917	98.352	94.521	94.161	94.760	97.561	92.761	94.896
R3	97.889	98.264	98.352	94.349	93.952	95.584	97.659	92.485	94.571
R4	98.043	97.338	98.352	94.349	93.535	95.210	97.561	93.037	93.828
R5	97.978	98.380	98.352	94.178	93.326	95.584	97.854	93.175	94.849
R6	98.031	97.569	98.443	94.606	94.056	95.659	98.049	93.106	94.988
R7	98.096	97.801	98.535	94.178	94.369	95.434	97.659	93.106	94.756
R8	98.088	98.148	98.626	94.435	94.265	95.509	97.854	93.313	94.478
R9	98.145	97.569	97.711	94.692	94.369	95.659	97.854	93.382	94.849
R10	98.031	98.264	97.802	94.692	94.578	95.509	97.561	92.692	94.756
Mean	98.046	97.951	98.333	94.426	94.067	95.442	97.707	93.023	94.599
SD	0.071	0.366	0.339	0.195	0.385	0.272	0.185	0.287	0.390
CV (%)	0.073	0.374	0.345	0.207	0.410	0.285	0.190	0.308	0.412

R1: repetition 1, R10: repetition 10.

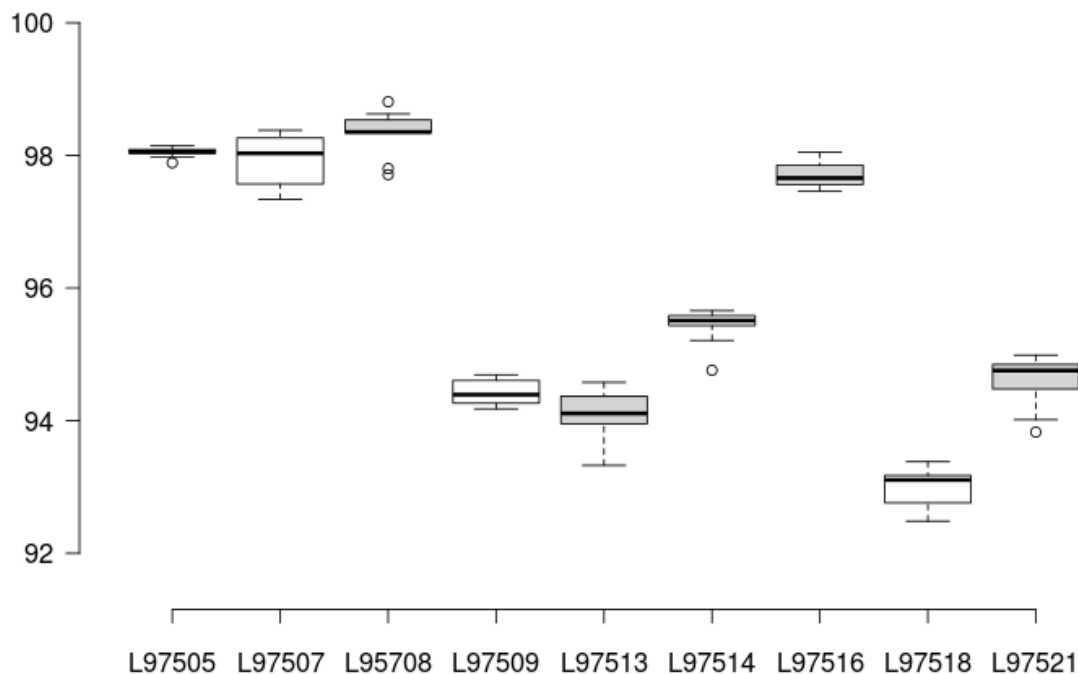


Figure A4. Boxplot dispersion of the values (%) per participant

## Annex 2. Quantitative results for gE serology

Sample PT2020SERIBRgE\_NS1

Table A5. Quantitative normalized value (%)

Lab ID	L97505	L97507.1	L97507.2	L97508.1	L97508.2	L97509	L97513	L97516	L97518	L97521
Method	IDEXX IBR gE Ab test	ID Screen gE Competition	IDEXX IBR gE Ab test	ID Screen gE Competition	IDEXX IBR gE Ab test	IDEXX IBR gE Ab test	IDEXX IBR gE Ab test	IDEXX IBR gE Ab test	CIVTES T SUIIS IBRgE	IDEXX IBR gE Ab test
R1	-6.30	10.09	-1.80	1.99	-5.85	-4.33	1.36	-7.76	-10.74	1.14
R2	2.36	2.74	2.63	-5.47	-7.18	-15.20	1.24	-7.28	-8.75	0.87
mean	-1.97	6.42	0.41	-1.74	-6.51	-9.76	1.30	-7.52	-9.74	1.01
SD	6.12	5.20	3.13	5.28	0.94	7.68	0.08	0.34	1.41	0.19
CV(%)	158.05	12.63	1844.29	174.03	2.22	8.06	4.92	0.59	1.49	18.48

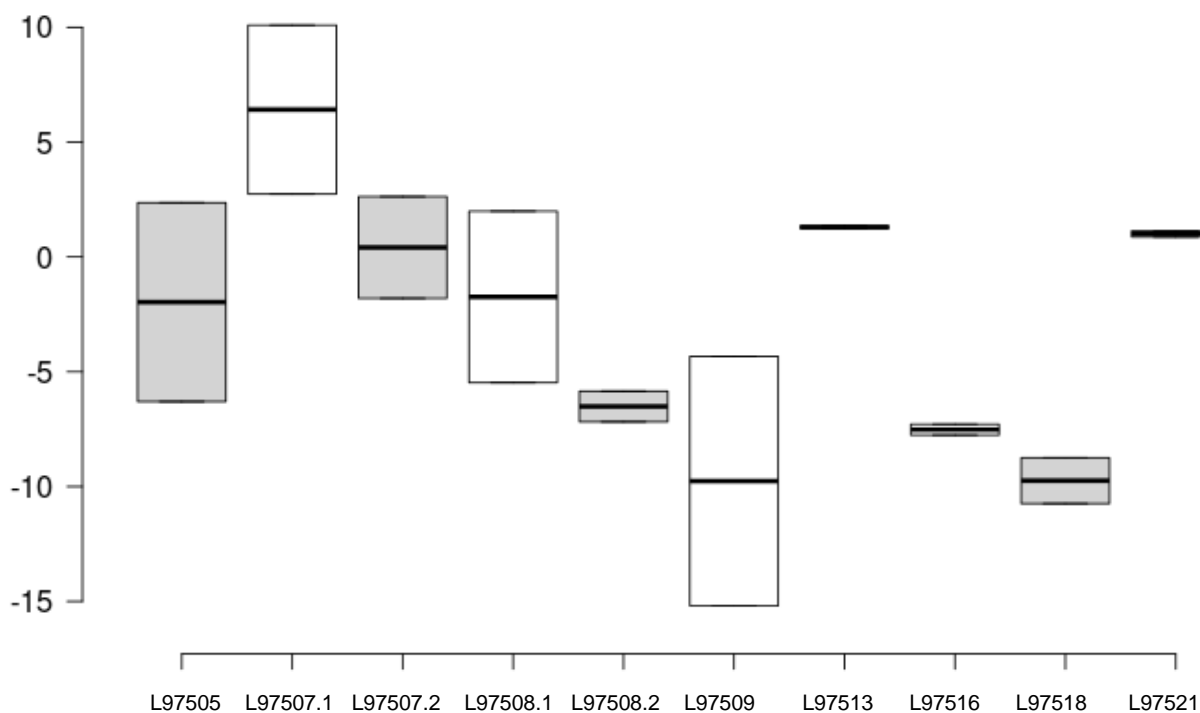


Figure A5. Boxplot distributions of the values (%) per participant

Table A6. Normalized quantitative results (%) per dataset

Lab ID	L97505	L97507.1	L97507.2	L97508.1	L97508.2	L97509	L97513	L97516	L97518	L97521
Method	IDEXX IBR gE Ab test	ID Screen gE Competition	IDEXX IBR gE Ab test	ID Screen gE Competition	IDEXX IBR gE Ab test	IDEXX IBR gE Ab test	IDEXX IBR gE Ab test	IDEXX IBR gE Ab test	CIVTES T SUIS IBRgE	IDEXX IBR gE Ab test
R1	5.91	5.32	5.10	4.69	0.43	-10.21	1.26	-1.74	4.14	1.11
R2	9.06	4.38	5.72	4.34	-7.26	-13.89	1.12	-3.01	4.91	1.03
mean	7.48	4.85	5.41	4.51	-3.41	-12.05	1.19	-2.38	4.53	1.07
SD	2.23	0.66	0.44	0.25	5.44	2.60	0.09	0.90	0.54	0.06
CV(%)	29.77	13.69	8.08	5.57	-159.30	-21.57	7.89	-37.71	11.98	5.82

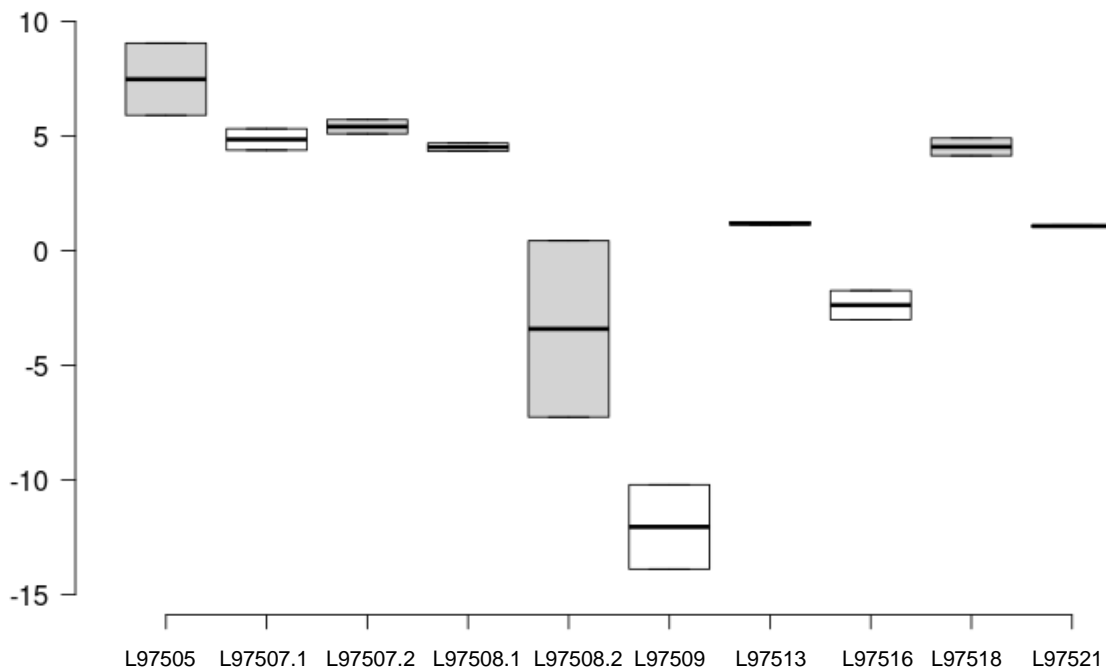


Figure A6. Boxplot of the values (%) dispersion per participant

Table A7. Normalized quantitative results (%) per dataset

Lab ID	L97505	L97507.1	L97507.2	L97508.1	L97508.2	L97509	L97513	L97516	L97518	L97521
<b>Method</b>	IDEXX IBR gE Ab test	ID Screen gE Competition	IDEXX IBR gE Ab test	ID Screen gE Competition	IDEXX IBR gE Ab test	IDEXX IBR gE Ab test	IDEXX IBR gE Ab test	IDEXX IBR gE Ab test	CIVTEST SUIS IBRgE	IDEXX IBR gE Ab test
<b>R1</b>	11.02	5.71	7.99	8.88	-6.24	-7.27	1.07	-4.04	4.55	1.04
<b>R2</b>	0.00	10.25	11.08	7.75	-3.96	-5.31	1.13	3.40	5.63	1.00
<b>R3</b>	10.24	11.82	10.66	8.03	-3.49	-11.60	1.16	0.63	2.40	1.02
<b>R4</b>	-5.12	5.09	-1.08	8.88	-5.61	-1.80	1.19	-2.06	0.51	1.01
<b>Mean</b>	4.04	8.22	7.16	8.39	-4.83	-6.50	1.14	-0.51	3.27	1.02
<b>SD</b>	7.90	3.32	5.66	0.59	1.31	4.09	0.05	3.24	2.28	0.02
<b>CV</b>	195.83	40.47	79.09	6.99	-27.11	-62.95	4.23	- 629.39	69.56	1.56

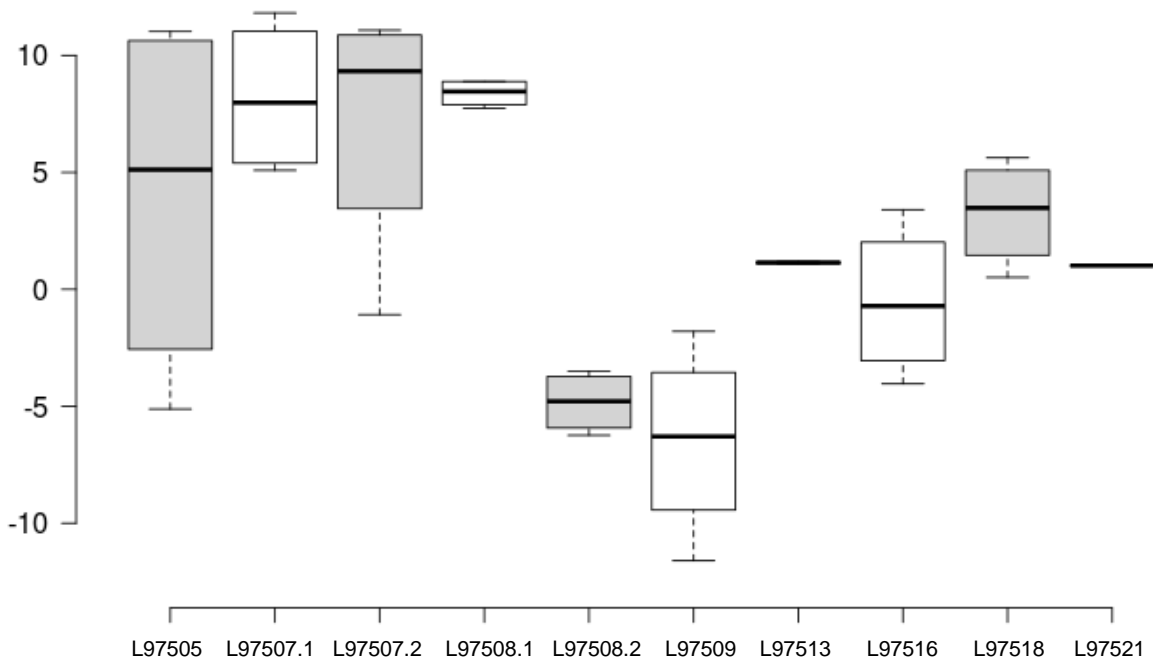


Figure A7. Boxplots of the values dispersion per dataset

Table A8. Normalized quantitative values (%)

Lab ID	L97505	L97507.1	L97507.2	L97508.1	L97508.2	L97509	L97513	L97516	L97518	L97521
Method	IDEXX IBR gE Ab test	ID Screen gE Competition	IDEXX IBR gE Ab test	ID Screen gE Competition	IDEXX IBR gE Ab test	IDEXX IBR gE Ab test	IDEXX IBR gE Ab test	IDEXX IBR gE Ab test	CIVTEST SUIS IBRgE	IDEXX IBR gE Ab test
R1	73.62	57.20	73.83	46.20	71.99	69.69	0.29	75.77	70.03	0.25
R2	79.13	47.10	74.45	47.12	74.34	74.35	0.29	74.27	69.82	0.25
R3	79.92	48.83	78.16	43.99	73.56	70.18	0.29	74.58	70.38	0.29
R4	78.74	48.28	74.55	44.49	74.42	71.57	0.30	79.73	71.66	0.26
R5	76.38	49.53	74.65	44.42	72.70	72.22	0.27	75.61	71.10	0.25
R6	76.77	47.81	77.54	44.85	72.54	71.90	0.27	73.79	69.62	0.24
R7	75.59	49.37	74.55	46.84	74.11	70.34	0.28	77.59	71.41	0.28
R8	67.72	45.77	73.83	44.85	73.40	71.73	0.30	74.19	70.08	0.24
Mean	75.98	49.24	75.19	45.34	73.38	71.50	0.29	75.69	70.51	0.26
SD	3.93	3.45	1.68	1.20	0.90	1.47	0.01	2.04	0.77	0.02
CV (%)	5.17	7.00	2.23	2.64	1.23	2.06	4.67	2.69	1.10	7.18

NB: the data from the same kit are different due to the formula used to normalized the data

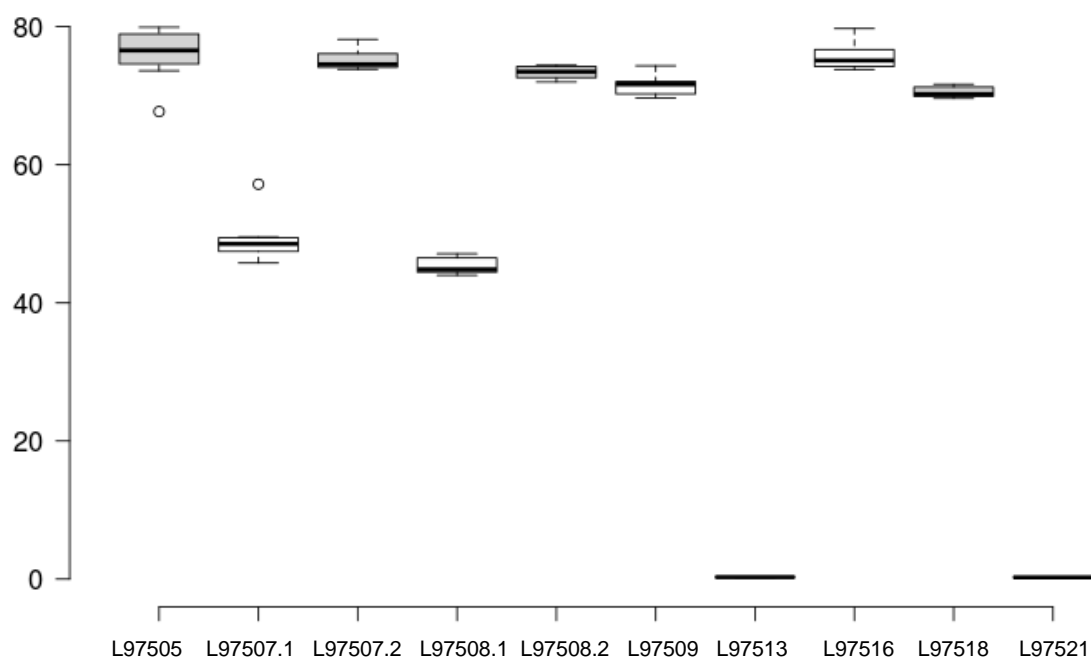


Figure A8. Boxplots of the values distribution per dataset.



Sample PT2020SERIBRgE PS2

Table A9. Normalized quantitative results per datasets.

Lab ID	L97505	L97507.1	L97507.2	L97508.1	L97508.2	L97509	L97513	L97516	L97518	L97521
Method	IDEXX IBR gE Ab test	ID Screen gE Competiti on	IDEXX IBR gE Ab test	ID Screen gE Competiti on	IDEXX IBR gE Ab test	IDEXX IBR gE Ab test	IDEXX IBR gE Ab test	IDEXX IBR gE Ab test	CIVTEST SUIS IBRgE	IDEXX IBR gE Ab test
R1	92.520	91.784	88.047	92.111	92.625	92.320	0.140	92.162	71.714	0.095
R2	92.913	91.236	90.726	92.253	93.331	92.075	0.091	92.478	69.616	0.100
R3	92.520	91.549	88.047	91.898	92.154	92.647	0.101	92.162	71.611	0.091
R4	92.126	91.784	88.150	91.613	92.703	91.585	0.087	92.082	70.793	0.096
mean	92.520	91.588	88.743	91.969	92.703	92.157	0.105	92.221	70.934	0.096
SD	0.321	0.260	1.323	0.278	0.484	0.447	0.024	0.176	0.970	0.004
CV (%)	0.347	0.283	1.491	0.303	0.522	0.486	23.300	0.190	1.367	3.871

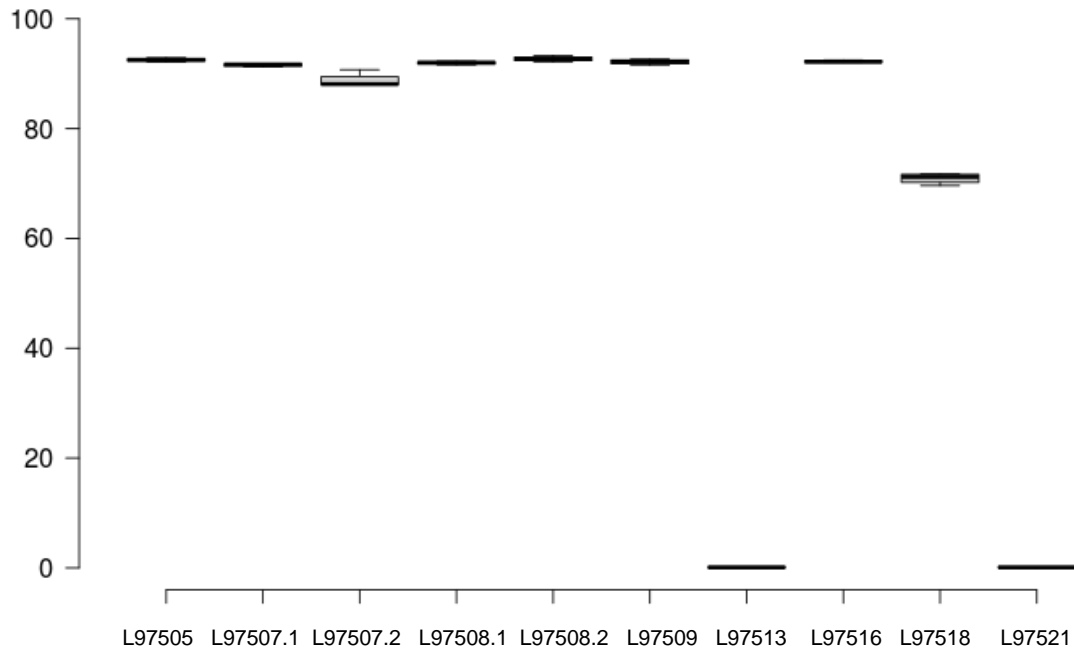


Figure A9. Boxplot of the values distribution per dataset.

## **Annex 3: 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](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:

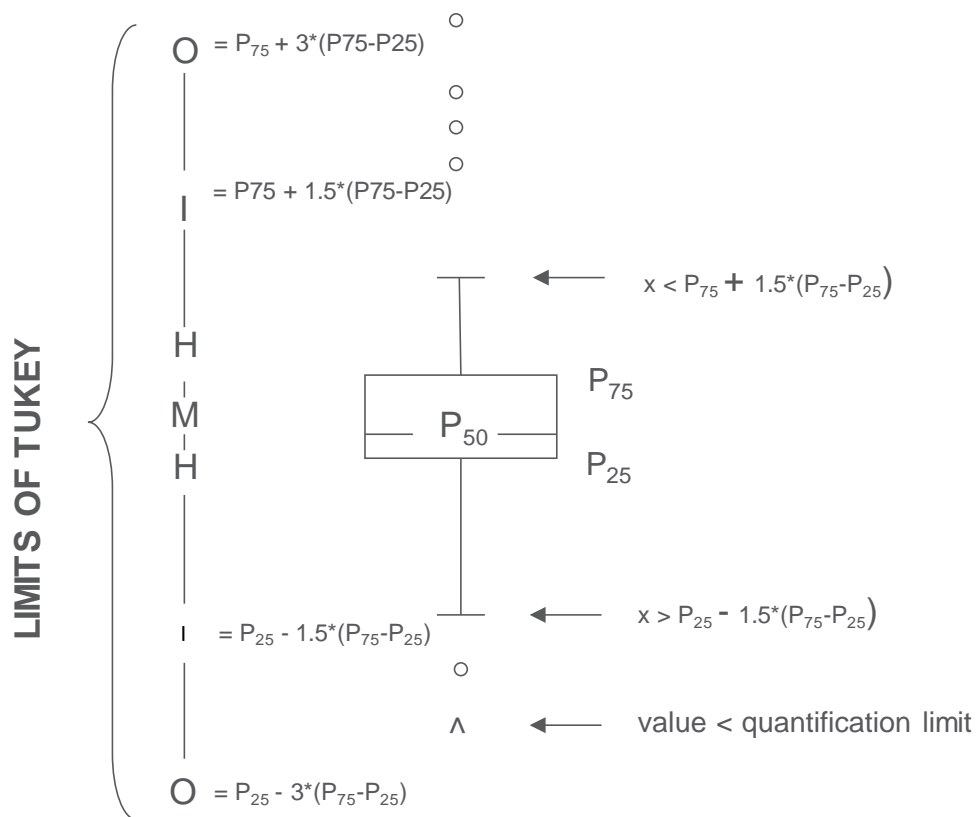
The link is:

[https://www.wiv-isp.be/QML/activities/external\\_quality/calendar/calender\\_PT%20VET/fr/Calendrier\\_2020-PT%20VET%202.htm](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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