

**EXPERTISE AND SERVICE PROVISION
QUALITY OF LABORATORIES**

**EXTERNAL QUALITY ASSESSMENT
IN VETERINARY DIAGNOSIS**

DEFINITIVE GLOBAL REPORT

**Proficiency Testing in Veterinary Diagnosis
Bovine Viral Diarrhoea Virus
SURVEY 2020/10**

Sciensano/PT VET BVD/1-E

Expertise and service provision
Quality of laboratories
J. Wytsmanstreet, 14
1050 Bruxelles | Belgique

www.sciensano.be

COMMITTEE OF EXPERTS

Sciensano					
Secretariat		PHONE:	02/642.55.22	FAX:	02/642.56.45
Name scheme coordinator	Bernard China	PHONE:	02 642 53 85		
		e-mail:	Bernard.China@sciensano.be		
Name alternate scheme coordinator	Arnaud Capron	PHONE:			
		e-mail:	Arnaud.Capron@sciensano.be		
Experts	Institute				
Ann Brigitte Cay	Sciensano				
Marylene Tignon	Sciensano				
Muriel Verhoeven	Sciensano				

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Introduction

This survey was dedicated to the detection of BVDV in Blood, serum and ear notches by PCR and ELISA

The samples

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

PCR on blood

Homogeneity

For PCR in blood, 5 different samples were used: PT2020BVDVIRNB1, PT2020BVDVIRNB2, PT2020BVDVIRPB1, PT2020BVDVIRPB2, PT2020BVDVIRPB3

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.

PT2020BVDVIRNB1 and PT2020BVDVIRNB2 are negative.

PT2020BVDVIRPB1, PT2020BVDVIRPB2 and PT2020BVDVIRPB3 are positive.

Stability

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

The participants

4 laboratories participated to the IBR Virology survey:

Sciensano ; Arsia (Ciney) , DGZ (Torhout) and LMVE (Luxemburg)

Randomisation and panel composition

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

Sample Order	Group 1 97505 and 97507,	Group 2 97508 and 97516
BVDBLOODPCR2001	PT2020BVDVIRNB1	PT2020BVDVIRPB1
BVDBLOODPCR2002	PT2020BVDVIRNB2	PT2020BVDVIRPB2
BVDBLOODPCR2003	PT2020BVDVIRNB2	PT2020BVDVIRPB3
BVDBLOODPCR2004	PT2020BVDVIRNB1	PT2020BVDVIRPB2
BVDBLOODPCR2005	PT2020BVDVIRPB1	PT2020BVDVIRPB3
BVDBLOODPCR2006	PT2020BVDVIRPB2	PT2020BVDVIRPB1
BVDBLOODPCR2007	PT2020BVDVIRPB3	PT2020BVDVIRNB1
BVDBLOODPCR2008	PT2020BVDVIRPB2	PT2020BVDVIRNB2
BVDBLOODPCR2009	PT2020BVDVIRPB3	PT2020BVDVIRNB2
BVDBLOODPCR2010	PT2020BVDVIRPB1	PT2020BVDVIRNB1

The panel was constituted of 10 samples of 250 ul.

PCR on Sera

Homogeneity

4 different samples were used: PT2020BVDAgSERNS1, PT2020BVDAgSERNS2, PT2020BVDAgSERPS1 and PT2020BVDAgSERPS2

The homogeneity of the samples were tested by the NRL on replicates of each sample. The samples were considered as homogeneous.

The participants

3 laboratories participated to the BVD PCR on serum survey: Sciensano, Arsia (Ciney), DGZ (Torhout).

Target values

The target values were determined by the NRL using the homogeneity results. PT2020BVDAgSERNS1 and PT2020BVDAgSERNS2 are considered as negative. PT2020BVDAgSERPS1 and PT2020BVDAgSERPS2 are considered as positive.

Stability

The samples were tested before and during 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 and 97507	Group 2 97508
Sample Order		
BVDSERPCR2001	PT2020BVDAgSERNS1	PT2020BVDAgSERNS2
BVDSERPCR2002	PT2020BVDAgSERNS2	PT2020BVDAgSERNS1
BVDSERPCR2003	PT2020BVDAgSERNS1	PT2020BVDAgSERNS2
BVDSERPCR2004	PT2020BVDAgSERNS2	PT2020BVDAgSERNS1
BVDSERPCR2005	PT2020BVDAgSERNS2	PT2020BVDAgSERNS2
BVDSERPCR2006	PT2020BVDAgSERPS1	PT2020BVDAgSERPS2
BVDSERPCR2007	PT2020BVDAgSERPS2	PT2020BVDAgSERPS1
BVDSERPCR2008	PT2020BVDAgSERPS2	PT2020BVDAgSERPS1
BVDSERPCR2009	PT2020BVDAgSERPS2	PT2020BVDAgSERPS2
BVDSERPCR2010	PT2020BVDAgSERPS1	PT2020BVDAgSERPS2

The PCR on serum panel consisted of 10 serum samples of 500 ul.

PCR on ear notches

Homogeneity

9 different samples were used: PT2020BVDVIREP1, PT2020BVDVIREP2, PT2020BVDVIREP3, PT2020BVDVIREP4, PT2020BVDVIREP5, PT2020BVDVIREN1, PT2020BVDVIREN2, PT2020BVDVIREN3 and PT2020BVDVIREN4

The homogeneity of the samples were tested by the NRL on replicates of each sample. The samples were considered as homogeneous.

The participants

6 laboratories participated to the BVD PCR on serum survey: Sciensano, Arsia (Ciney), DGZ (Torhout), LNCR / ACSEDIATE(France), LMVE (Luxemburg), IDEXX (Switzerland).

Target values

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

PT2020BVDVIREN1, PT2020BVDVIREN2, PT2020BVDVIREN3 and PT2020BVDVIREN4 are considered as negative.

PT2020BVDVIREP1, PT2020BVDVIREP2, PT2020BVDVIREP3, PT2020BVDVIREP4 and PT2020BVDVIREP5 are considered as positive.

Stability

The samples were tested before and during 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 and 97521	Group 2 97508 , 97510 and 97516
Sample Order		
BVDENPCR2001	PT2020BVDVIREP1	PT2020BVDVIREN1
BVDENPCR2002	PT2020BVDVIREP2	PT2020BVDVIREN2
BVDENPCR2003	PT2020BVDVIREP3	PT2020BVDVIREN3
BVDENPCR2004	PT2020BVDVIREP4	PT2020BVDVIREN2
BVDENPCR2005	PT2020BVDVIREP5	PT2020BVDVIREN4
BVDENPCR2006	PT2020BVDVIREN3	PT2020BVDVIREP5
BVDENPCR2007	PT2020BVDVIREN2	PT2020BVDVIREP4
BVDENPCR2008	PT2020BVDVIREN4	PT2020BVDVIREP3
BVDENPCR2009	PT2020BVDVIREN2	PT2020BVDVIREP2
BVDENPCR2010	PT2020BVDVIREN1	PT2020BVDVIREP1

The PCR on serum panel consisted of 9 tissue samples.

ELISA on Blood Homogeneity

5 different samples were used: PT2020BVDAgVIRNB1, PT2020BVDAgVIRNB2, PT2020BVDAgVIRPB1, PT2020BVDAgVIRPB2 and PT2020BVDAgVIRPB3
The homogeneity of the samples were tested by the NRL on replicates of each sample.
The samples were considered as homogeneous.

The participants

5 laboratories participated to the BVD PCR on serum survey: Sciensano, Arsia (Ciney), DGZ (Torhout), Lavetan, Hipra (Spain).

Target values

The target values were determined by the NRL using the homogeneity results.
PT2020BVDAgVIRNB1 and PT2020BVDAgVIRNB2 are considered as negative.
PT2020BVDAgVIRPB1, PT2020BVDAgVIRPB2 and PT2020BVDAgVIRPB3 are considered as positive.

Stability

The samples were tested before and during 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 and 97509	Group 2 97508 and 97518
Sample Order		
BVDBLOODAg2001	PT2020BVDAgVIRNB1	PT2020BVDAgVIRPB1
BVDBLOODAg2002	PT2020BVDAgVIRNB2	PT2020BVDAgVIRPB2
BVDBLOODAg2003	PT2020BVDAgVIRNB1	PT2020BVDAgVIRPB1
BVDBLOODAg2004	PT2020BVDAgVIRNB2	PT2020BVDAgVIRPB2
BVDBLOODAg2005	PT2020BVDAgVIRPB1	PT2020BVDAgVIRPB3
BVDBLOODAg2006	PT2020BVDAgVIRPB2	PT2020BVDAgVIRPB3
BVDBLOODAg2007	PT2020BVDAgVIRPB1	PT2020BVDAgVIRNB2
BVDBLOODAg2008	PT2020BVDAgVIRPB2	PT2020BVDAgVIRNB2
BVDBLOODAg2009	PT2020BVDAgVIRPB3	PT2020BVDAgVIRNB1
BVDBLOODAg2010	PT2020BVDAgVIRPB3	PT2020BVDAgVIRNB1

The PCR on serum panel consisted of 10 blood samples of 500 µl.

ELISA on sera

Homogeneity

5 different samples were used: PT2020BVDAgVIRNS1, PT2020BVDAgVIRNS2, PT2020BVDAgVIRPS1, PT2020BVDAgVIRPS2 and PT2020BVDAgVIRPS3. The homogeneity of the samples were tested by the NRL on replicates of each sample. The samples were considered as homogeneous.

The participants

6 laboratories participated to the BVD PCR on serum survey: Sciensano, Arsia (Ciney), DGZ (Torhout), Lavetan, Hipra (Spain), Idexx (Switzerland).

Target values

The target values were determined by the NRL using the homogeneity results. PT2020BVDAgVIRNS1 and PT2020BVDAgVIRNS2 are considered as negative. PT2020BVDAgVIRPS1, PT2020BVDAgVIRPS2 and PT2020BVDAgVIRPS3 are considered as positive.

Stability

The samples were tested before and during 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 and 97521	Group 2 97508 and 97518
Sample Order		
BVDSERAg2001	PT2020BVDAgVIRNS1	PT2020BVDAgVIRPS1
BVDSERAg2002	PT2020BVDAgVIRNS1	PT2020BVDAgVIRPS1
BVDSERAg2003	PT2020BVDAgVIRPS1	PT2020BVDAgVIRPS3
BVDSERAg2004	PT2020BVDAgVIRPS2	PT2020BVDAgVIRPS3
BVDSERAg2005	PT2020BVDAgVIRPS3	PT2020BVDAgVIRNS2
BVDSERAg2006	PT2020BVDAgVIRPS3	PT2020BVDAgVIRNS2
BVDSERAg2007	PT2020BVDAgVIRPS1	PT2020BVDAgVIRNS2
BVDSERAg2008	PT2020BVDAgVIRNS2	PT2020BVDAgVIRPS2
BVDSERAg2009	PT2020BVDAgVIRNS2	PT2020BVDAgVIRNS1
BVDSERAg2010	PT2020BVDAgVIRNS2	PT2020BVDAgVIRNS1

The panel consisted of 10 serum samples of 500 µl.

ELISA on ear notches

Homogeneity

9 different samples were used: PT2020BVDAgVIREP1, PT2020BVDAgVIREP2,, PT2020BVDAgVIREP3, PT2020BVDAgVIREP4, PT2020BVDAgVIREP5, PT2020BVDAgVIREN1, PT2020BVDAgVIREN2, PT2020BVDAgVIREN3 and PT2020BVDAgVIREN4.

The homogeneity of the samples were tested by the NRL on replicates of each sample. The samples were considered as homogeneous.

The participants

6 laboratories participated to the BVD PCR on serum survey: Sciensano, Arsia (Ciney), DGZ (Torhout), Lavetan, Hipra (Spain), Idexx (Switzerland).

Target values

The target values were determined by the NRL using the homogeneity results. PT2020BVDAgVIREN1, PT2020BVDAgVIREN2, PT2020BVDAgVIREN3 and PT2020BVDAgVIREN4 are considered as negative. PT2020BVDAgVIREP1, PT2020BVDAgVIREP2,, PT2020BVDAgVIREP3, PT2020BVDAgVIREP4 and PT2020BVDAgVIREP5 are considered as positive.

Stability

The samples were tested before and during 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 and 97521	Group 2 97508 and 97518
Sample Order		
BVDENAg2001	PT2020BVDAgVIREP1	PT2020BVDAgVIREN1
BVDENAg2002	PT2020BVDAgVIREP2	PT2020BVDAgVIREN2
BVDENAg2003	PT2020BVDAgVIREP3	PT2020BVDAgVIREN3
BVDENAg2004	PT2020BVDAgVIREP4	PT2020BVDAgVIREN4
BVDENAg2005	PT2020BVDAgVIREP5	PT2020BVDAgVIREN2
BVDENAg2006	PT2020BVDAgVIREN2	PT2020BVDAgVIREP5
BVDENAg2007	PT2020BVDAgVIREN3	PT2020BVDAgVIREP4
BVDENAg2008	PT2020BVDAgVIREN4	PT2020BVDAgVIREP3
BVDENAg2009	PT2020BVDAgVIREN2	PT2020BVDAgVIREP2
BVDENAg2010	PT2020BVDAgVIREN1	PT2020BVDAgVIREP1

The panel consisted of 10 tissue samples.

Survey Timeline

Transfer of the samples from NRL to QL: 01/10/2020

Randomization of the samples by QL: 06-09/10/2020

sending samples to participants: 12/10/2020. The samples were sent on dry ice.

Deadline for the results encoding: 16/11/2020

Preliminary report: 16/11/2020

Results

1.PCR

1.1. PCR on blood

The panel consisted of 10 blood samples: 4 negative and 6 positive samples.
4 laboratories encoded one dataset.

1.1.1. Results per sample

Table R1. Results per sample

Sample ID	Expected result	Number of repetitions (total results)	Observed result
PT2020BVDVIRNB1	Negative	2 (8)	8 negative results
PT2020BVDVIRNB2	Negative	2 (8)	8 negative results
PT2020BVDVIRPB1	Positive	2 (8)	8 positive results
PT2020BVDVIRPB2	Positive	2 (8)	8 positive results
PT2020BVDVIRPB3	Positive	2 (8)	8 positive results

Globally, on 40 encoded results, 100% were correct.

1.1.2. Used methods

Table R2. Results per method

Method	N	NR	NCR	%
Home made	1	10	10	100
LSI VetMax BVD4ALL (Thermofisher)	3	30	30	100
TOTAL	4	40	40	100

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

1.2. PCR on SERA

1.2.1. Results per sample

The panel consisted of 10 serum samples: 5 negative and 5 positive samples.
3 participants encoded one dataset.

Table R3. Results per sample

Sample ID	Expected result	Number of repetitions (total results)	Observed result
PT2020BVDAgSERNS1	Negative	2 (6)	6 negative results
PT2020BVDAgSERNS2	Negative	3 (9)	9 negative results
PT2020BVDAgSERPS1	Positive	2 (6)	6 positive results
PT2020BVDAgSERPS2	Positive	3 (9)	9 positive results

Globally, on 30 encoded results, 100% were correct.

1.2.1. Used methods

Table R4. Results per method

Method	N	NR	NCR	%
Home made	1	10	10	100
LSI VetMax BVD4ALL (Thermofisher)	2	20	20	100
TOTAL	3	30	30	100

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

1.3. PCR on ear notches

1.3.1. Results par sample

The panel consisted of 10 tissue samples: 5 negative and 5 positive samples.
6 participants encoded one dataset.

Table R5. Results per sample

Sample ID	Expected result	Number of repetitions (total results)	Observed result
PT2020BVDVIREN1	Negative	1 (6)	6 negative results
PT2020BVDVIREN2	Negative	2 (12)	12 negative results
PT2020BVDVIREN3	Negative	1 (6)	6 negative results
PT2020BVDVIREN4	Negative	1 (6)	6 negative results
PT2020BVDVIREP1	Positive	1 (6)	6 positive results
PT2020BVDVIREP2	Positive	1 (6)	6 positive results
PT2020BVDVIREP3	Positive	1 (6)	6 positive results
PT2020BVDVIREP4	Positive	1 (6)	6 positive results
PT2020BVDVIREP5	Positive	1 (6)	5 positive results 1 not determined result

Globally, on 60 encoded results, 59/60 (98.3%) were correct.

One laboratory was unable to analyze one sample due to fact that the tube was empty.

1.3.2. Used methods

Table R6. Results per method

Used PCR Method	N	NR	NCR	%
Home made (Letellier et al, 2003)	1	10	10	100
Other	1	10	10	100
LSI VetMax BVD4ALL (Thermofisher)	2	20	19	95
BVDV RT-PCR Kit (Indical Bioscience)	2	20	20	100
TOTAL	6	60	59	98.3

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

1.3.3. Used thermocyclers

Table R7. Used thermocyclers

Thermocycler	N
Roche Lightcycler 480	2
ABI7500	3
Stratagene Mx3005P	1
TOTAL	6

1.3.4. Extraction method

Table R8. Extraction methods

Method	N
Qiagen:RNAesy	1
Qiagen:MagAttract 96 Cador Pathogen Kit	1
Iddex:RealPCR Rapid Lysis Buffer	1
IDVET:Lysis buffer	1
Life technologies:Magvet universal isolation kit	2
Total	6

2.ELISA

The aim was to detect BVDV antigen in different matrixes using an ELISA method.

2.1. ELISA on Blood

The panel consisted of 10 blood samples: 4 negative and 6 positive samples.
5 participants encoded one dataset.

2.1.1.Results par sample

Table R9. Results per sample

Sample ID	Expected result	Number of repetitions (total results)	Observed result
PT2020BVDAgVIRNB1	Negative	2 (10)	10 negative results
PT2020BVDAgVIRNB2	Negative	2 (10)	10 negative results
PT2020BVDAgVIRPB1	Positive	2 (10)	10 positive results
PT2020BVDAgVIRPB2	Positive	2 (10)	10 positive results
PT2020BVDAgVIRPB2	Positive	2 (10)	10 positive results

On the 50 encoded results, 100% were correct.

2.1.2.Used methods

All the participants used the IDEXX BVDV Ag/Serum Plus Test kit.

2.1.3.Conclusion

All the participants obtained 100% of success in this survey.

2.2. ELISA on serum

The panel consisted of 10 serum samples: 5 negative and 5 positive samples.
6 participants encoded one dataset.

2.2.1. Results par sample

Table R9. Results per sample

Sample ID	Expected result	Number of repetitions (total results)	Observed result
PT2020BVDAgVIRNS1	Negative	2 (12)	12 negative results
PT2020BVDAgVIRNS2	Negative	3 (18)	18 negative results
PT2020BVDAgVIRPS1	Positive	2 (12)	12 positive results
PT2020BVDAgVIRPS2	Positive	1 (6)	6 positive results
PT2020BVDAgVIRPS3	Positive	2 (12)	12 positive results

On the 60 encoded results, 100% were correct.

2.2.2. Used methods

All the participants used the IDEXX BVDV Ag/Serum Plus Test kit.

2.2.3. Conclusion

All the participants obtained 100% of success in this survey.

2.3. ELISA on ear notches

The panel consisted of 10 tissue samples: 5 negative and 5 positive.
6 participants encoded one dataset.

2.3.1. Results per sample

Table R9. Results per sample

Sample ID	Expected result	Number of repetitions (total results)	Observed result
PT2020BVDAgVIREN1	Negative	1 (6)	6 negative results
PT2020BVDAgVIREN2	Negative	2 (12)	12 negative results
PT2020BVDAgVIREN3	Negative	1 (6)	6 negative results
PT2020BVDAgVIREN4	Negative	1 (6)	6 negative results
PT2020BVDAgVIREP1	Positive	1 (6)	6 positive results
PT2020BVDAgVIREP2	Positive	1 (6)	6 positive results
PT2020BVDAgVIREP3	Positive	1 (6)	6 positive results
PT2020BVDAgVIREP4	Positive	1 (6)	6 positive results
PT2020BVDAgVIREP5	Positive	1 (6)	6 positive results

On the 60 encoded results, 100% were correct.

2.3.2. Used methods

All the participants used the IDEXX BVDV Ag/Serum Plus Test kit.

2.3.3. Conclusion

All the participants obtained 100% of success in this survey.

ANNEXES (Not Under Accreditation)

Annex 1. Quantitative data for PCR

+

PCR on blood

Sample PT2020BVDVIRPB1

Table A1. Quantitative values (Ct)

Lab ID	L97505	L97507	L95708	L97516
Method	Home made	LSI VetMax BVD4ALL (Thermofisher)		
R1	33.26	27.51	26.45	26.45
R2	34.86	27.29	26.82	27.28
Mean	34.06	27.40	26.64	26.87
SD	1.13	0.16	0.26	0.59
CV (%)	3.32%	0.57%	0.98%	2.18%

Rn: repetition n

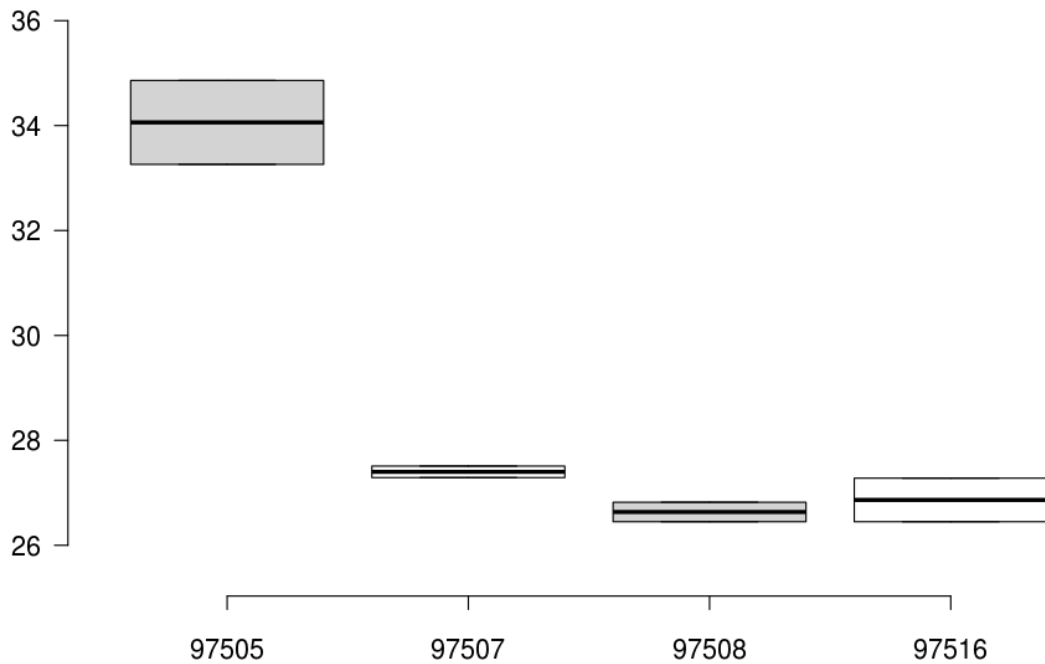


Figure A1. Boxplot dispersion of the results (Ct) per participant for the sample PB1
The boxplots were performed using the shiny.chemgrid.org/boxplotr/ software

Sample PT2020BVDVIRPB2

Table A2. Quantitative values (Ct)

Lab ID	L97505	L97507	L95708	L97516
Method	Home made	LSI VetMax BVD4ALL (Thermofisher)		
R1	31.20	22.48	20.62	20.22
R2	31.23	22.37	21.24	20.46
Mean	31.22	22.43	20.93	20.34
SD	0.02	0.08	0.44	0.17
CV (%)	0.1%	0.3%	2.1%	0.8%

R1: repetition 1, R2: repetition 2

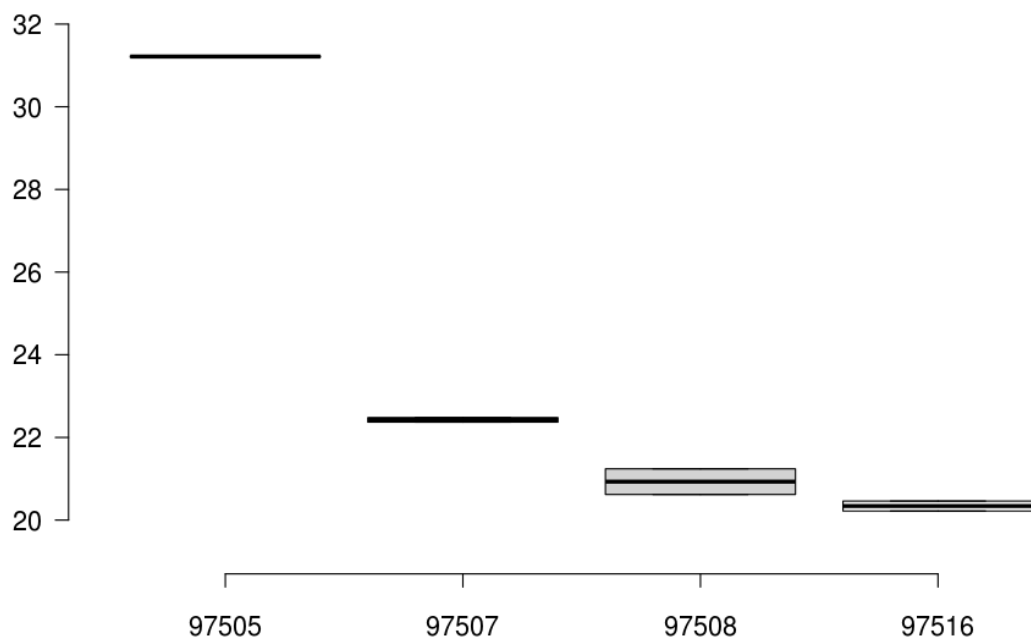


Figure A2. Boxplot distribution of the values (Ct) per participant

The boxplots were performed using the shiny.chemgrid.org/boxplotr/ software

Sample PT2020BVDVIRPB3

Table A3. Quantitative values (Ct)

Lab ID	L97505	L97507	L95708	L97516
Method	Home made	LSI VetMax BVD4ALL (Thermofisher)		
R1	32.94	26.58	25.38	25.78
R2	32.14	26.24	25.18	26.54
Mean	32.54	26.41	25.28	26.16
SD	0.57	0.24	0.14	0.54
CV (%)	1.7%	0.9%	0.6%	2.1%

Rn: repetition n

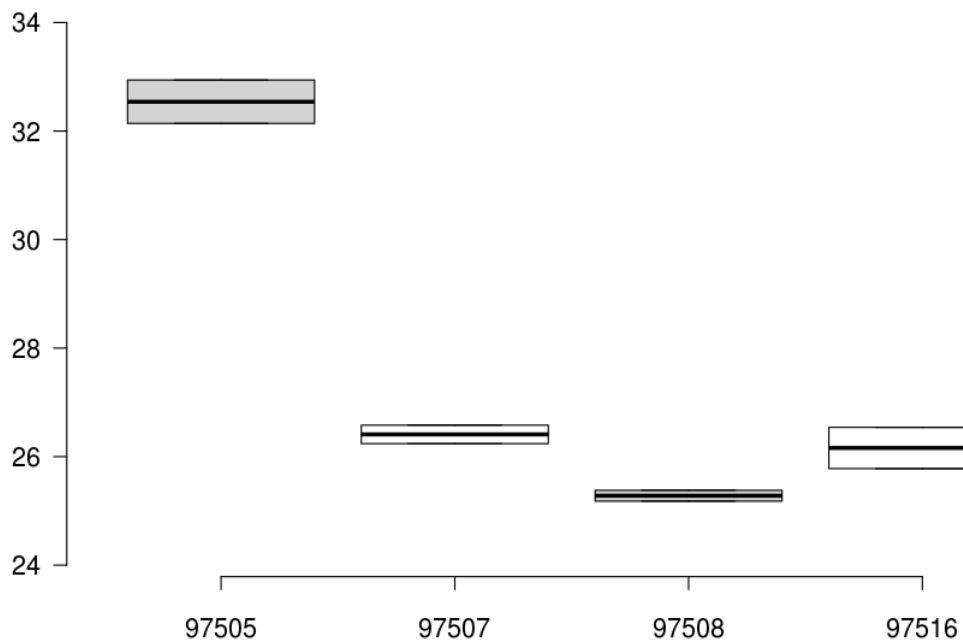


Figure A3. Boxplot dispersion of the values (Ct) per participant

The boxplots were performed using the shiny.chemgrid.org/boxplotr/ software

PCR on serum

Sample PT2020BVDAgSERPS1

Table A4. Quantitative normalized values (%)

Lab ID	L97505	L97507	L95708
Method	Home made	LSI VetMax BVD4ALL (Thermofisher)	
R1	30.04	25.35	25.05
R2	30.88	25.25	24.51
Mean	30.46	25.30	24.78
SD	0.59	0.07	0.38
CV (%)	1.9%	0.3%	1.5%

Rn: repetition n

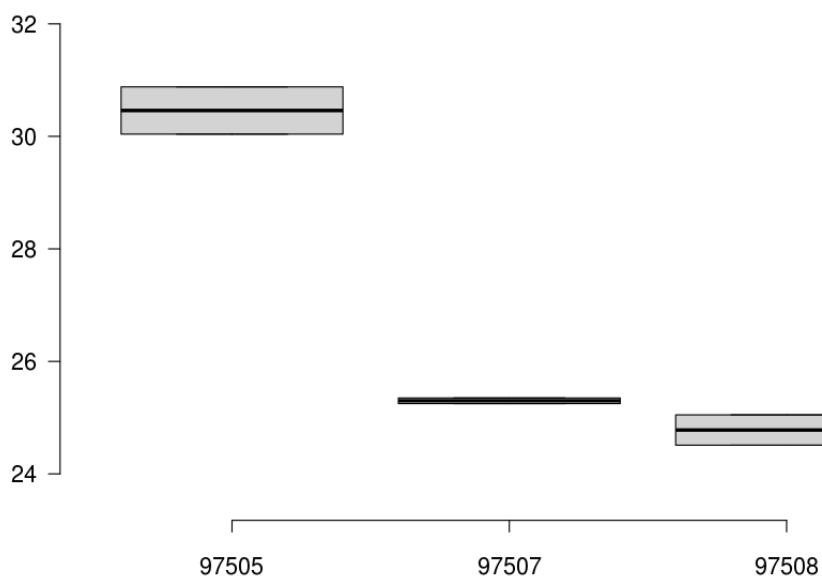


Figure A4. Boxplot dispersion of the values (Ct) per participant

The boxplots were performed using the shiny.chemgrid.org/boxplot/ software

Sample PT2020BVDAgSERPS2

Table A5. Quantitative values (Ct)

Lab ID	L97505	L97507	L95708
Method	Home made	LSI VetMax BVD4ALL (Thermofisher)	
R1	27.27	22.06	21.38
R2	27.99	22.69	22.48
Mean	27.52	22.53	21.60
SD	27.59	22.43	21.82
CV (%)	0.37	0.33	0.58

Rn: repetition n

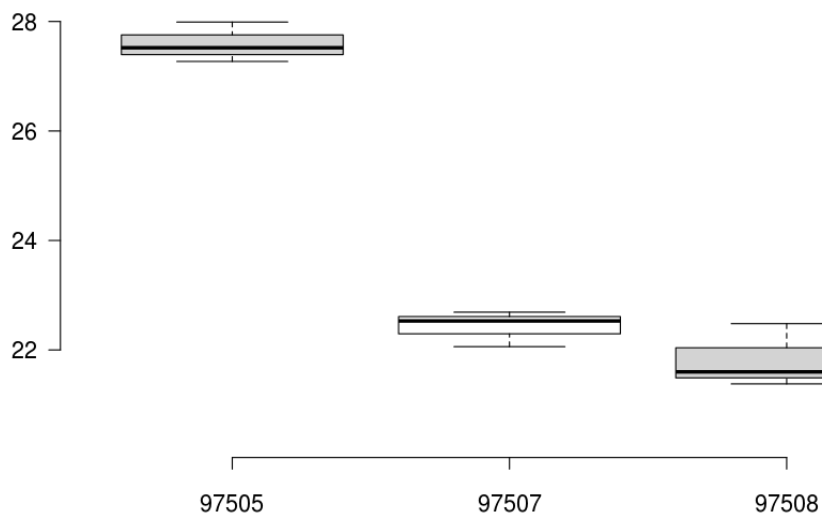


Figure A5. Boxplot dispersion of the values (Ct) per participant

The boxplots were performed using the shiny.chemgrid.org/boxplot/ software

Annex 2. Quantitative results for ELISA

ELISA on Blood

Sample PT2020BVDAgVIRNB1

Table A6: Quantitative normalized value (%)

LAB ID	97505	97507	97508	97509	97518
Method	IDEXX BVDV Ag/Serum Plus Test				
REP1	0.013	0.023	0.007	0.015	0.009
REP2	0.013	0.001	0.014	0.025	0.023
mean	0.013	0.012	0.011	0.020	0.016
SD	0.000	0.016	0.005	0.007	0.009
CV	0.0%	129.6%	47.1%	35.4%	57.5%

Rn: repetition n

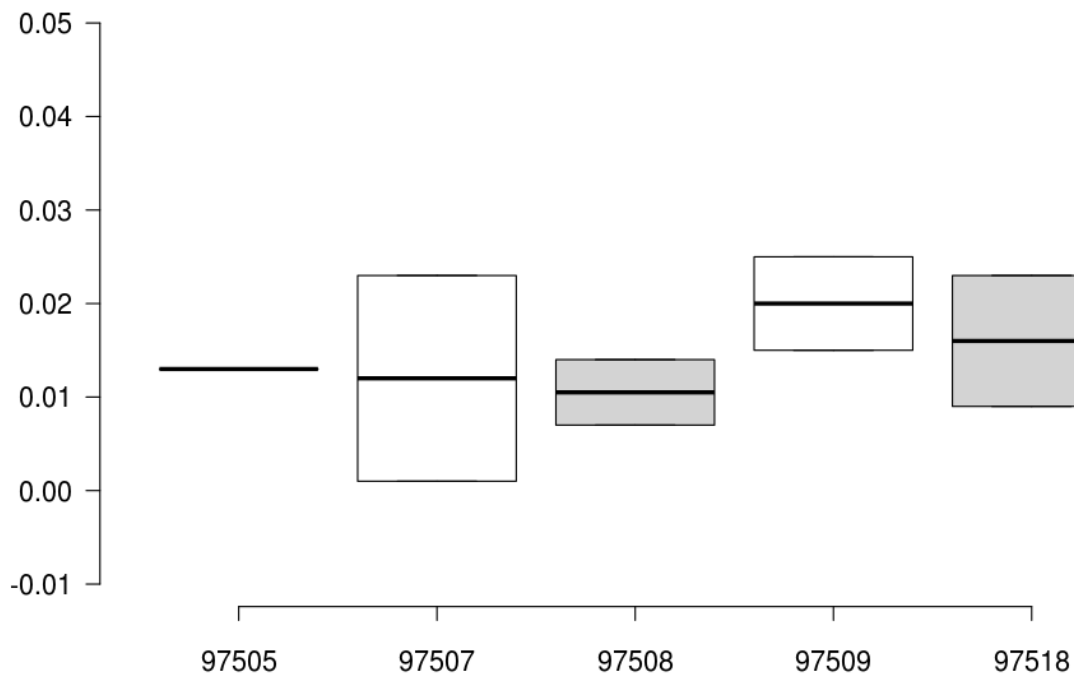


Figure A6. Boxplot distributions of the values (%) per participant

The boxplots were performed using the shiny.chemgrid.org/boxplot/ software

Sample PT2020BVDAgVIRNB2

Table A7: Quantitative normalized value (%)

LAB ID	97505	97507	97508	97509	97518
Method	IDEXX BVDV Ag/Serum Plus Test				
REP1	0.024	0.014	0.011	0.061	0.046
REP2	0.021	-0.003	0.008	0.031	0.017
mean	0.022	0.006	0.010	0.046	0.031
SD	0.002	0.012	0.002	0.021	0.021
CV	9.6%	218.6%	22.3%	46.1%	66.1%

Rn: repetition n

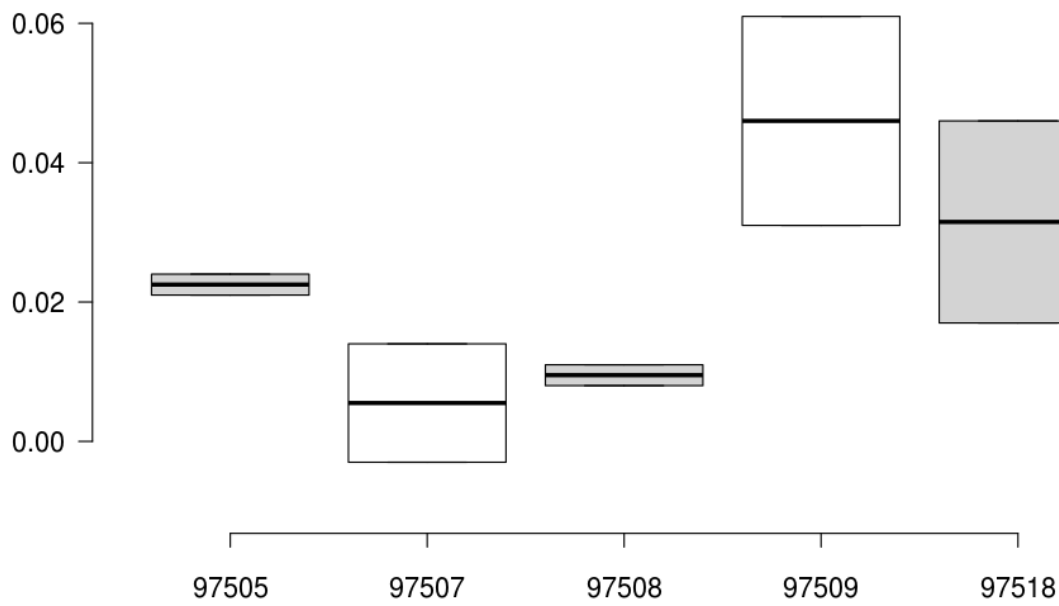


Figure A7. Boxplot distributions of the values (%) per participant

The boxplots were performed using the shiny.chemgrid.org/boxplotr/ software

Sample PT2020BVDAgVIRPB1

Table A8: Quantitative normalized value (%)

LAB ID	97505	97507	97508	97509	97518
Method	IDEXX BVDV Ag/Serum Plus Test				
REP1	5.29	2.56	3.35	2.47	3.23
REP2	4.00	2.58	3.34	2.88	3.23
mean	4.65	2.57	3.34	2.67	3.23
SD	0.91	0.01	0.01	0.29	0.00
CV	19.62%	0.52%	0.28%	10.97%	0.00%

Rn: repetition n

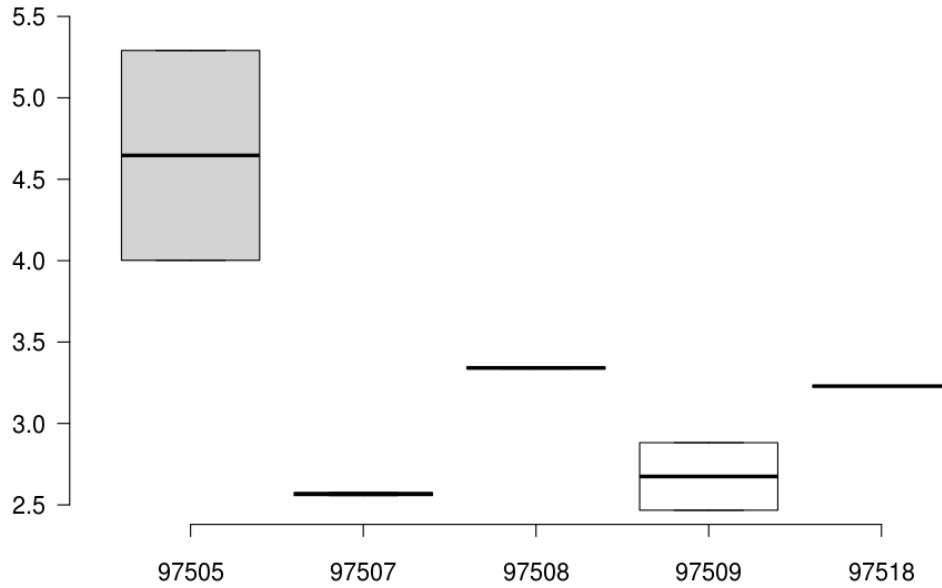


Figure A8. Boxplot distributions of the values (%) per participant

The boxplots were performed using the shiny.chemgrid.org/boxplot/ software

Sample PT2020BVDAgVIRPB2

Table A9: Quantitative normalized value (%)

LAB ID	97505	97507	97508	97509	97518
Method	IDEXX BVDV Ag/Serum Plus Test				
REP1	5.52	3.02	3.42	3.11	3.69
REP2	5.90	3.06	3.40	3.15	3.91
mean	5.71	3.04	3.41	3.13	3.80
SD	0.27	0.03	0.01	0.03	0.16
CV	4.7%	0.9%	0.4%	1.0%	4.2%

Rn: repetition n

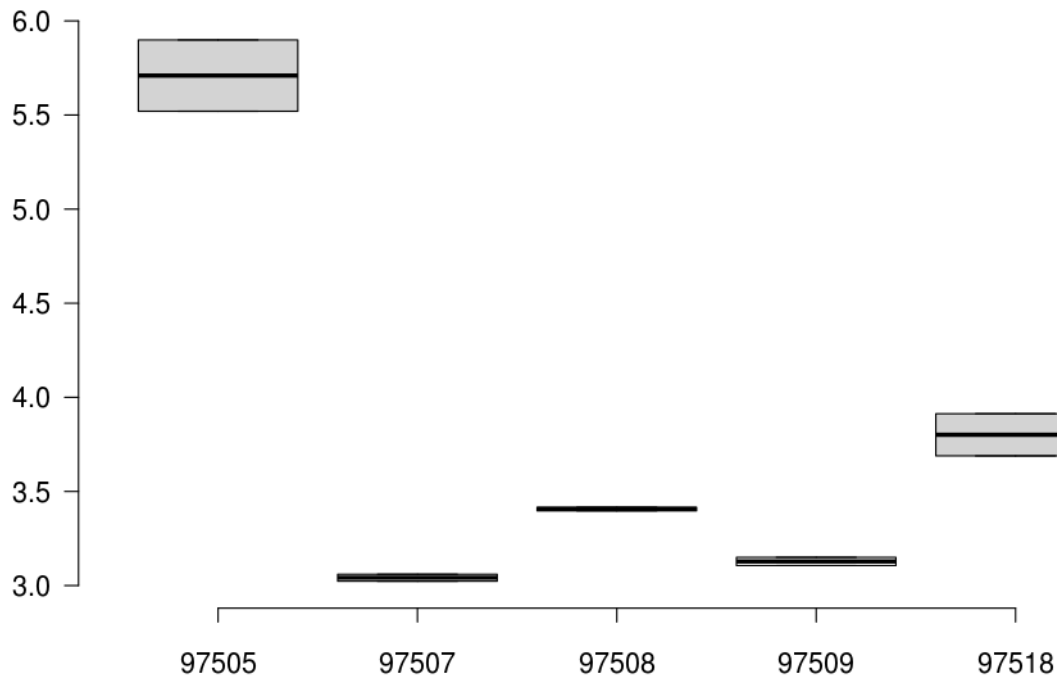


Figure A9. Boxplot distributions of the values (%) per participant
The boxplots were performed using the shiny.chemgrid.org/boxplot/ software

Sample PT2020BVDAgVIRPB3

Table A10: Quantitative normalized value (%)

LAB ID	97505	97507	97508	97509	97518
Method	IDEXX BVDV Ag/Serum Plus Test				
REP1	1.28	0.93	1.40	0.82	1.48
REP2	1.24	0.89	1.51	0.81	1.40
mean	1.26	0.91	1.45	0.82	1.44
SD	0.03	0.03	0.07	0.01	0.06
CV	2.2%	3.5%	5.1%	1.2%	4.1%

Rn: repetition n

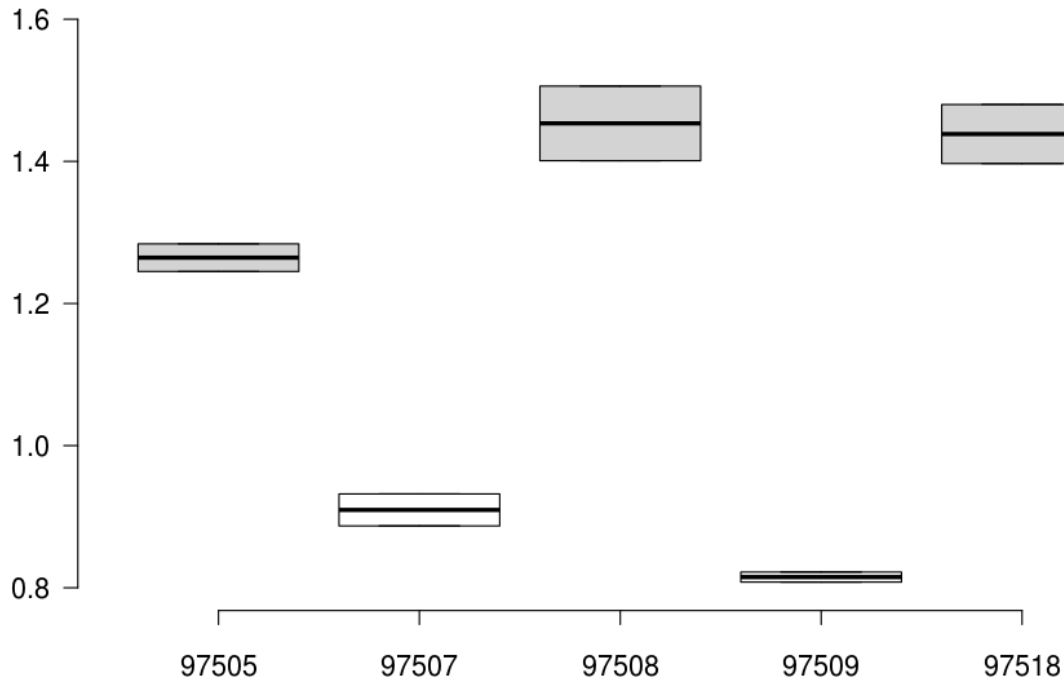


Figure A10. Boxplot distributions of the values (%) per participant

The boxplots were performed using the shiny.chemgrid.org/boxplot/ software

ELISA on serum

Sample PT2020BVDAgVIRNS1

Table A11: Quantitative normalized value (%)

LAB ID	97505	97507	97508	97509	97518	97521
Method	IDEXX BVDV Ag/Serum Plus Test					
REP1	0.00	0.03	0.00	-0.01	-0.01	-0.02
REP2	-0.01	0.01	-0.02	-0.01	0.00	-0.01
mean	-0.01	0.02	-0.01	-0.01	-0.01	-0.02
SD	0.00	0.01	0.01	0.00	0.00	0.00
CV	-42.4%	70.7%	-124.8%	-33.7%	-25.7%	-15.7%

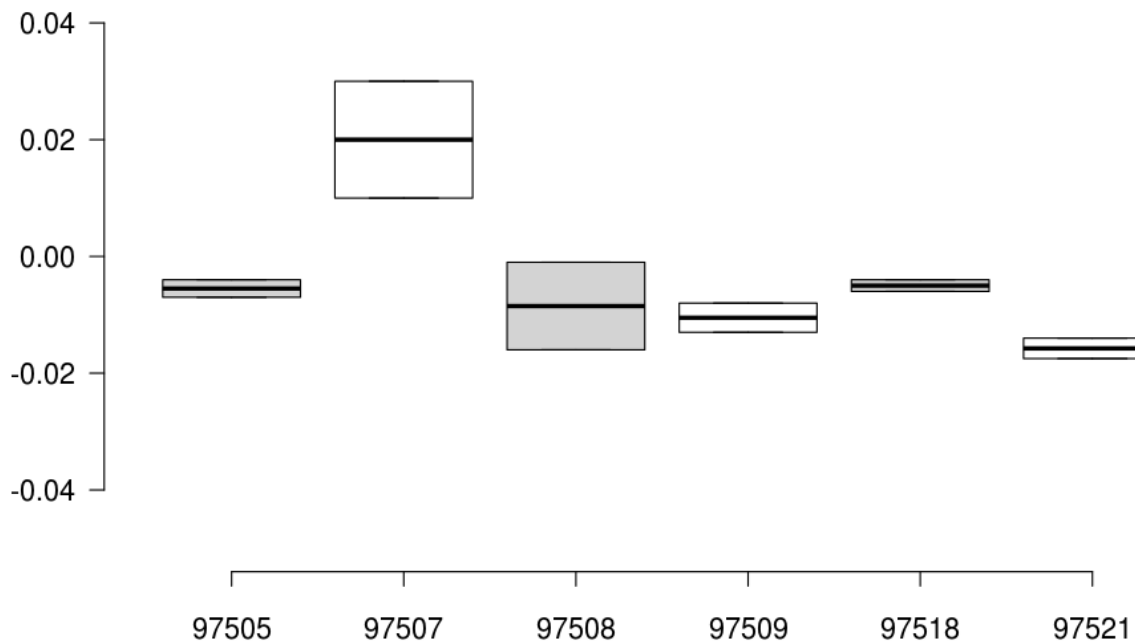


Figure A11. Boxplot distributions of the values (%) per participant

The boxplots were performed using the shiny.chemgrid.org/boxplotr/ software

Sample PT2020BVDAgVIRNS2

Table A12: Quantitative normalized value (%)

LAB ID	97505	97507	97508	97509	97518	97521
Method	IDEXX BVDV Ag/Serum Plus Test					
REP1	-0.001	-0.006	-0.014	-0.003	0.000	-0.014
REP2	0.017	0.003	0.006	-0.001	-0.002	-0.013
REP3	0.030	0.000	-0.004	-0.003	0.001	-0.011
mean	0.015	-0.001	-0.004	-0.002	-0.001	-0.012
SD	0.015	0.005	0.010	0.001	0.002	0.001
CV	102.0%	-458.3%	-250.0%	-49.5%	-183.3%	-10.2%

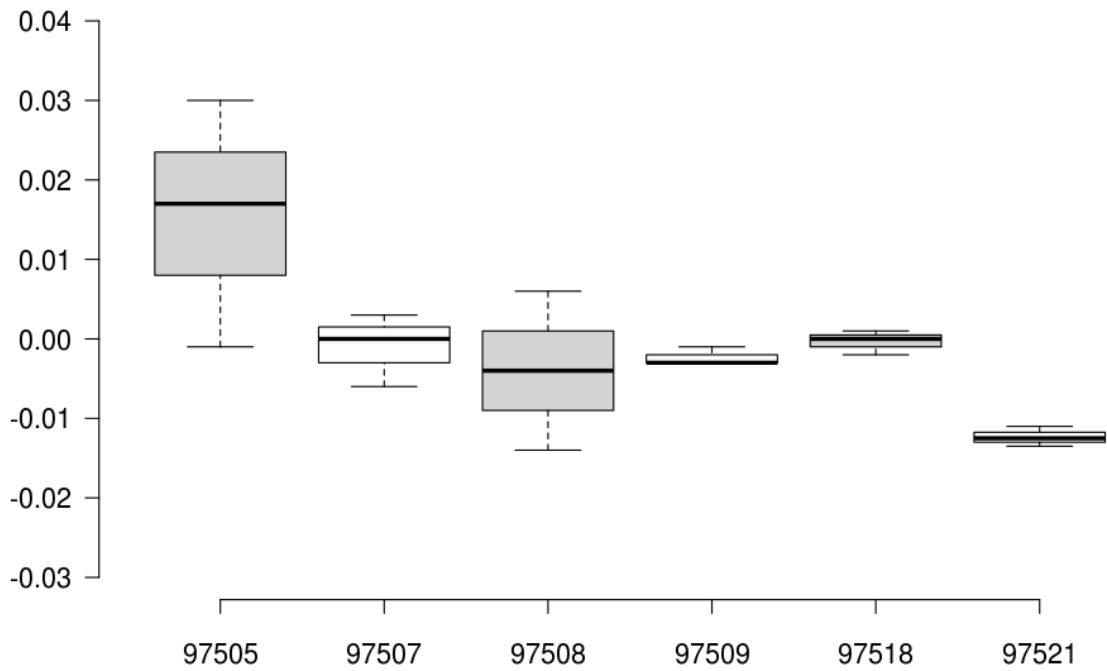


Figure A12. Boxplot distributions of the values (%) per participant

The boxplots were performed using the shiny.chemgrid.org/boxplotr/ software

Sample PT2020BVDAgVIRPS1

Table A13: Quantitative normalized value (%)

LAB ID	97505	97507	97508	97509	97518	97521
Method	IDEXX BVDV Ag/Serum Plus Test					
REP1	5.27	3.19	3.40	3.31	3.55	3.38
REP2	4.59	3.17	3.43	3.43	3.60	3.44
mean	4.93	3.18	3.42	3.37	3.58	3.41
SD	0.48	0.01	0.02	0.08	0.03	0.04
CV	9.8%	0.4%	0.7%	2.5%	0.9%	1.3%

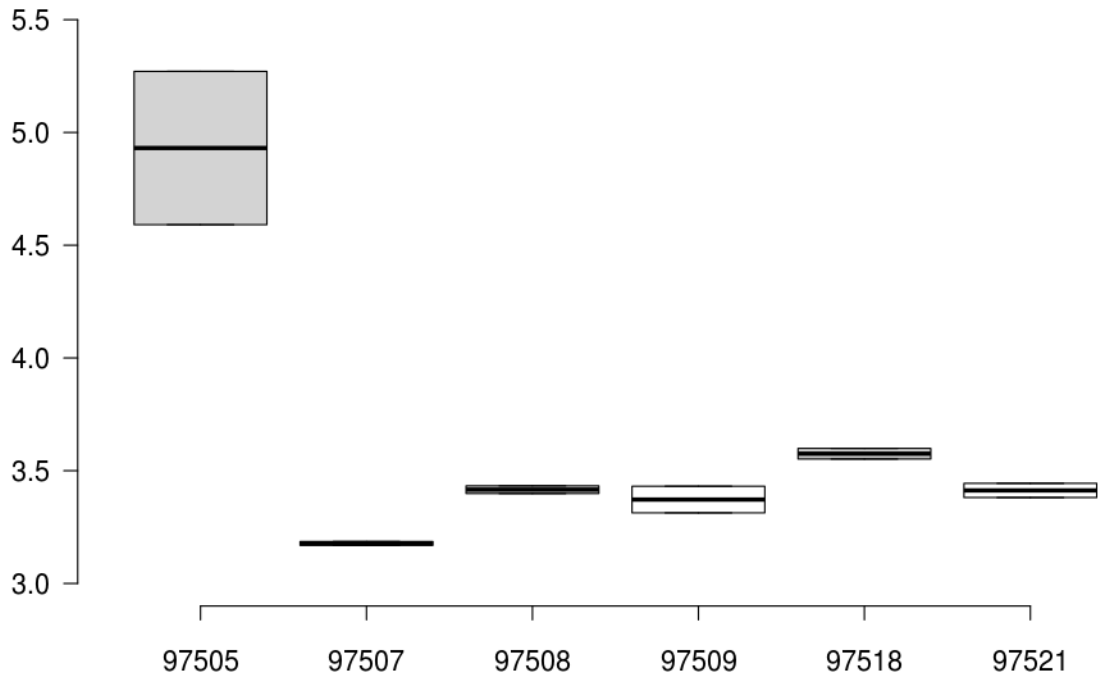


Figure A13. Boxplot distributions of the values (%) per participant

The boxplots were performed using the shiny.chemgrid.org/boxplotr/ software

Sample PT2020BVDAgVIRPS3

Table A14: Quantitative normalized value (%)

LAB ID	97505	97507	97508	97509	97518	97521
Method	IDEXX BVDV Ag/Serum Plus Test					
REP1	4.887	3.139	3.601	3.514	3.695	3.703
REP2	4.509	3.135	3.561	3.435	3.741	3.744
mean	4.698	3.137	3.581	3.475	3.718	3.724
SD	0.267	0.003	0.028	0.056	0.033	0.029
CV	5.7%	0.1%	0.8%	1.6%	0.9%	0.8%

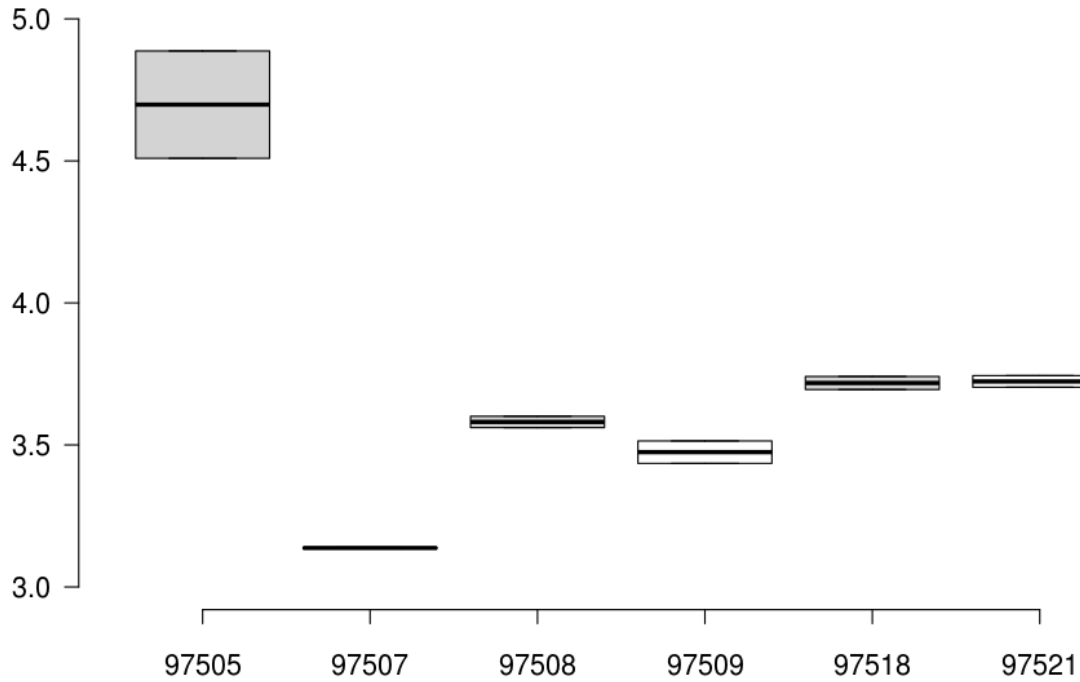


Figure A14. Boxplot distributions of the values (%) per participant

The boxplots were performed using the shiny.chemgrid.org/boxplotr/ software

ELISA on ear notches

Sample PT2020BVDAgVIREN2

Table A15: Quantitative normalized value (%)

LAB ID	97505	97507	97508	97509	97518	97521
Method	IDEXX BVDV Ag/Serum Plus Test					
REP1	0.011	-0.012	0.031	0.022	0.005	0.026
REP2	0.011	0.019	0.031	0.007	0.013	0.056
mean	0.011	0.004	0.031	0.015	0.009	0.041
SD	0.000	0.022	0.000	0.011	0.005	0.022
CV	3.29%	626.29%	0.00%	73.15%	55.00%	52.92%

Rn: repetition n

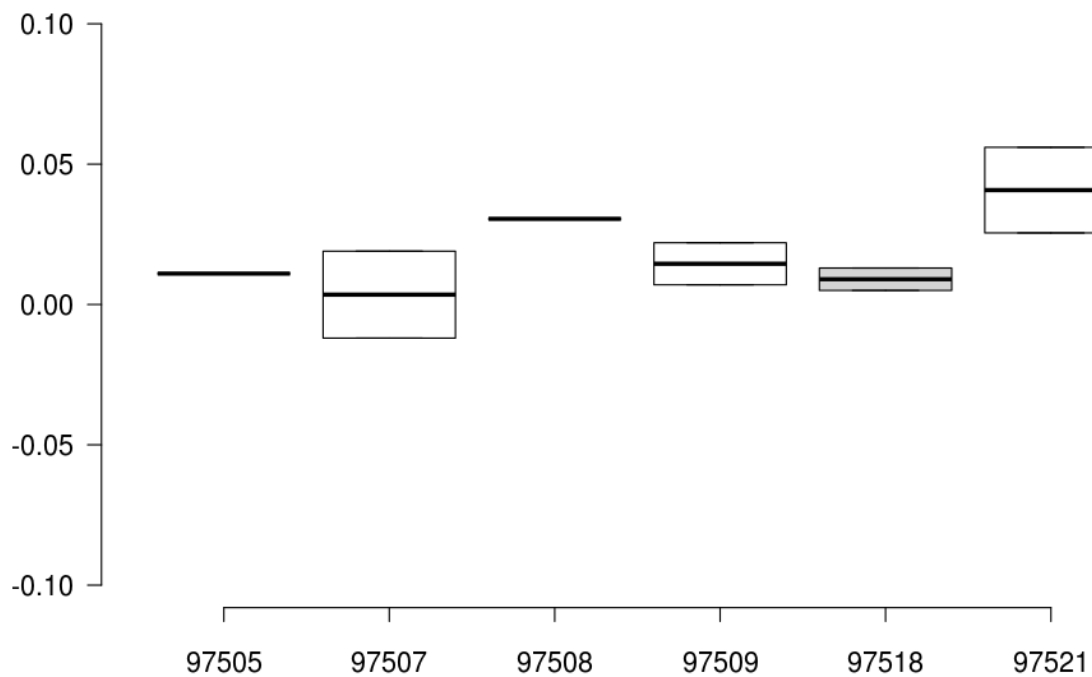


Figure A15. Boxplot distributions of the values (%) per participant

The boxplots were performed using the shiny.chemgrid.org/boxplotr/ software

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

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

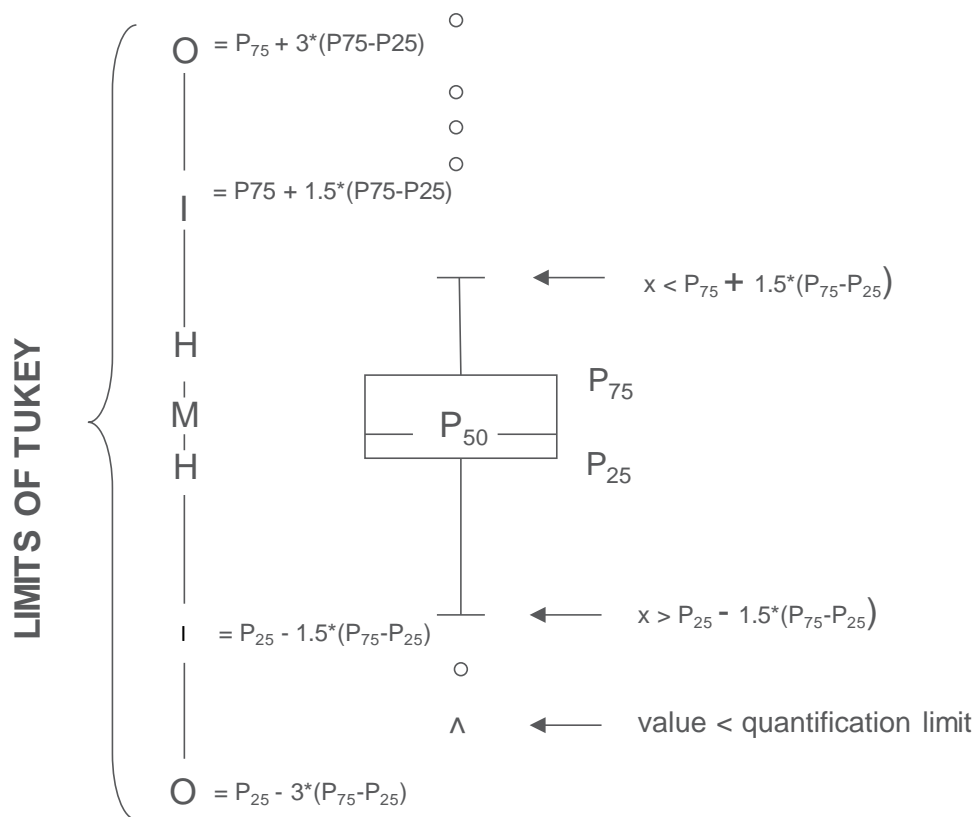
The link is:

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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