EXPERTISE AND SERVICE PROVISION
QUALITY OF LABORATORIES

EXTERNAL QUALITY ASSESSMENT
IN VETERINARY DIAGNOSIS

DEFINITIVE GLOBAL REPORT

Proficiency Testing in Veterinary Diagnosis

Aujeszky's disease

SURVEY 2020/6

Sciensano/PT VET AUJEZSKY/1-E

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

www.sciensano.be

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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		
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TABLE OF CONTENTS

Introduction

This survey was dedicated to the detection of antibodies specific the virus responsible for Aujeszky's disease 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, 7 different samples were used: PT2020AUJELIgBNS1, PT2020AUJELIgBNS2, PT2020AUJELIgBNS3, PT2020AUJELIgBNS4, PT2020AUJELIgBPS1, PT2020AUJELIgBPS2 and PT2020AUJELIgBPS3.
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.
PT2020AUJELIgBNS1, PT2020AUJELIgBNS2, PT2020AUJELIgBNS3, PT2020AUJELIgBNS4 are negative.
PT2020AUJELIgBPS2 and PT2020AUJELIgBPS3.
are positive.
PT2020AUJELIgBPS1 is doubtful (NEG/POS).

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 Aujeszky's disease serology survey:
Sciensano ; Arsia (Ciney) , DGZ (Torhout), Anses Aujeszky (France), Hipra (Espagne).

Randomisation and panel composition

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

	Group 1 97505, 97507, 97515	Group 2 97508 and 97518.
Sample Order		
AUJgB2001	PT2020AUJELIgBNS1	PT2020AUJELIgBNS4
AUJgB2002	PT2020AUJELIgBNS2	PT2020AUJELIgBNS4
AUJgB2003	PT2020AUJELIgBNS1	PT2020AUJELIgBPS1
AUJgB2004	PT2020AUJELIgBNS2	PT2020AUJELIgBPS2
AUJgB2005	PT2020AUJELIgBNS1	PT2020AUJELIgBPS1
AUJgB2006	PT2020AUJELIgBNS2	PT2020AUJELIgBPS2
AUJgB2007	PT2020AUJELIgBNS3	PT2020AUJELIgBPS3
AUJgB2008	PT2020AUJELIgBNS4	PT2020AUJELIgBPS3
AUJgB2009	PT2020AUJELIgBNS3	PT2020AUJELIgBPS3
AUJgB2010	PT2020AUJELIgBNS3	PT2020AUJELIgBPS2
AUJgB2011	PT2020AUJELIgBNS4	PT2020AUJELIgBPS2
AUJgB2012	PT2020AUJELIgBPS2	PT2020AUJELIgBNS3
AUJgB2013	PT2020AUJELIgBPS3	PT2020AUJELIgBNS2
AUJgB2014	PT2020AUJELIgBPS2	PT2020AUJELIgBNS3
AUJgB2015	PT2020AUJELIgBPS3	PT2020AUJELIgBNS2
AUJgB2016	PT2020AUJELIgBPS2	PT2020AUJELIgBNS3
AUJgB2017	PT2020AUJELIgBPS1	PT2020AUJELIgBNS2
AUJgB2018	PT2020AUJELIgBPS2	PT2020AUJELIgBNS1
AUJgB2019	PT2020AUJELIgBPS3	PT2020AUJELIgBNS1
AUJgB2020	PT2020AUJELIgBPS1	PT2020AUJELIgBNS1

The panel was constituted of 20 samples of 250 ul.

2. gE serology

Homogeneity

6 different samples were used:
PT2020AUJELIgENS1, PT2020AUJELIgENS2, PT2020AUJELIgENS3, PT2020AUJELIgEPS1, PT2020AUJELIgEPS2 and PT2020AUJELIgEPS3.

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

The participants

7 laboratories participated to the Aujeszky's disease gE Serology survey: Sciensano, Arsia (Ciney), DGZ (Torhout),Lavetan, Anses Aujeszky (France), LMVE (Luxemburg), Hipra (Espagne).

Target values

The target values were determined by the NRL using the homogeneity results.
PT2020AUJELIgENS1, PT2020AUJELIgENS2 and PT2020AUJELIgENS3 are considered as negative. PT2020AUJELIgEPS1, PT2020AUJELIgEPS2 and PT2020AUJELIgEPS3 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 and 97515	Group 2 97508, 97516 and 97518
Sample Order		
AUJgE2001	PT2020AUJELIgENS1	PT2020AUJELIgEPS1
AUJgE2002	PT2020AUJELIgENS2	PT2020AUJELIgEPS2
AUJgE2003	PT2020AUJELIgENS1	PT2020AUJELIgEPS1
AUJgE2004	PT2020AUJELIgENS2	PT2020AUJELIgEPS2
AUJgE2005	PT2020AUJELIgENS2	PT2020AUJELIgEPS1
AUJgE2006	PT2020AUJELIgENS1	PT2020AUJELIgEPS2
AUJgE2007	PT2020AUJELIgENS3	PT2020AUJELIgEPS1
AUJgE2008	PT2020AUJELIgEPS1	PT2020AUJELIgEPS3
AUJgE2009	PT2020AUJELIgENS3	PT2020AUJELIgEPS3
AUJgE2010	PT2020AUJELIgEPS1	PT2020AUJELIgEPS3
AUJgE2011	PT2020AUJELIgENS3	PT2020AUJELIgEPS3
AUJgE2012	PT2020AUJELIgEPS1	PT2020AUJELIgENS3
AUJgE2013	PT2020AUJELIgEPS2	PT2020AUJELIgENS2
AUJgE2014	PT2020AUJELIgEPS1	PT2020AUJELIgENS3
AUJgE2015	PT2020AUJELIgEPS2	PT2020AUJELIgENS2
AUJgE2016	PT2020AUJELIgEPS3	PT2020AUJELIgENS1
AUJgE2017	PT2020AUJELIgEPS2	PT2020AUJELIgENS3
AUJgE2018	PT2020AUJELIgEPS3	PT2020AUJELIgENS1
AUJgE2019	PT2020AUJELIgEPS3	PT2020AUJELIgENS2
AUJgE2020	PT2020AUJELIgEPS3	PT2020AUJELIgENS1

The gE serology panel consisted of 20 lyophilized serum samples of 250 ul.

Survey Timeline

Transfer of the samples from NRL to QL: 25/05/2020
Randomization of the samples by QL: 7 and 08/05/2020
sending samples to participants: 02/06/2020. The samples were sent on dry ice.
Deadline for the results encoding: 30/06/2020
Preliminary report: 17/07/2020

Results

1.gB serology

1.1.Results per sample

5 laboratories encoded results.

Table R1. Results per sample

Sample ID	Expected result	Number of repetitions (total results)	Observed result
PT2020AUJELIgBNS1	Negative	3 (15)	15 negative results
PT2020AUJELIgBNS2	Negative	3 (15)	15 negative results
PT2020AUJELIgBNS3	Negative	3 (15)	15 negative results
PT2020AUJELIgBNS4	Negative	2 (10)	10 negative results
PT2020AUJELIgBPS1	Positive/Negative	2 (10)	8 positive results 2 negative results
PT2020AUJELIgBPS2	Positive	4 (20)	20 positive results
PT2020AUJELIgBPS3	Positive	3 (15)	15 positive results

Globally, on 100 encoded results, 100% were considered as correct.
For sample PS1 which was considered as doubtful, 1 laboratory found it negative and 4 laboratories found it positive.

1.2.Used methods

Table R2. Used methods

Method	N
PrioCHECK PRV gB Antibody	3
IDEXX PRV/ADV gB Ab test	1
Hipra CIVTEST SUIS ADVgB	1
Total	5

2. Serology gE

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

2.1.Results per sample

7 laboratories encoded results.

Table R3. Result per sample

Sample	Expected result	Number of repetition (number of results)	Observed result
PT2020AUJELIgENS1	Negative	3 (21)	21 Negative
PT2020AUJELIgENS2	Negative	3 (21)	21 Negative
PT2020AUJELIgENS3	Negative	3 (21)	21 Negative
PT2020AUJELIgEPS1	Positive	4 (28)	28 Positive
PT2020AUJELIgEPS2	Positive	3 (21)	21 Positive
PT2020AUJELIgEPS3	Positive	4 (28)	28 Positive

0n the 140 encoded results, 100% were correct.

2.2. Used methods

Table R4. Used methods

Method	N
Idexx PRV/ADV gI Ab test	6
Hipra CIVTEST SUIS ADVgE	1

ANNEXES

Annex 1.Quantitative data for gB serology

SAMPLE PT2020AUJELIgBNS1

Table A1. Quantitative normalized values (%)

Lab	L97505	L97507	L97508	L97515	L97518
Method	PrioCHECK PRV gB Antibody			IDEXX PRV/ADV gB Ab test	Hipra CIVTEST SUIS ADVgB
R1	-4,107	3,155	7,576	0,864	-5,537
R2	3,482	11,833	9,26	0,846	-3,827
R3	5,357	14,199	15,64	0,891	-2,524
Mean	1,577	9,729	10,825	0,867	1,577
SD	5,011	5,815	4,254	0,023	5,011
CV	317,7%	59,8%	39,3%	2,6%	317,7%

Rn= repetition n

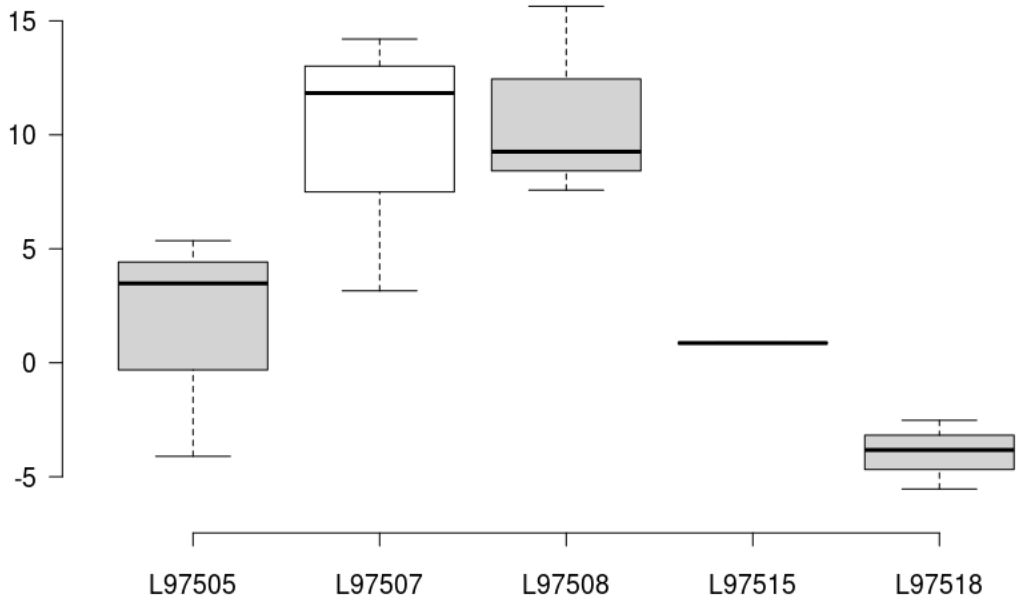


Figure A1. Boxplot dispersion of the results per participant for the sample gBNS1

Sample PT2020AUJELIgBNS2

Table A2. Quantitative normalized values

Lab	L97505	L97507	L97508	L97515	L97518
Method	PrioCHECK PRV gB Antibody			IDEXX PRV/ADV gB Ab test	Hipra CIVTEST SUIS ADVgB
R1	-1,696	7,039	23,084	0,923	2,117
R2	4,464	10,012	19,451	0,918	1,059
R3	3,125	11,165	8,253	0,957	-20,114
Mean	1,964	9,405	16,929	0,932	-5,646
SD	3,240	2,129	7,730	0,021	12,541
CV	165,0%	22,6%	45,7%	2,3%	-222,1%

Rn: repetition n

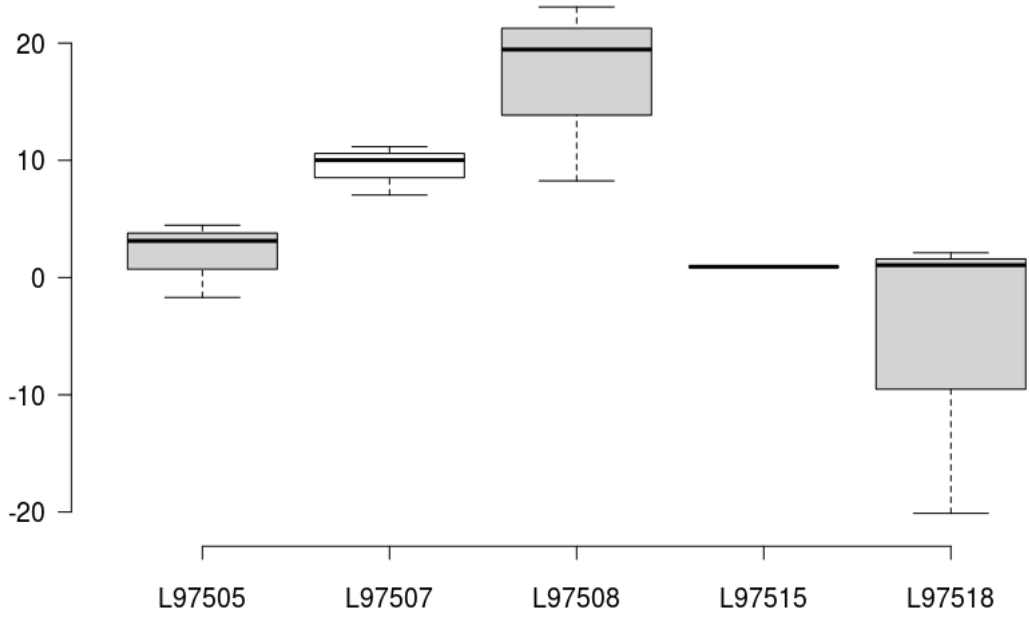


Figure A2. Boxplot dispersion of the results per participant for the sample gBNS2

Sample PT2020AUJELIgBNS3

Table A3. Quantitative normalized values (%)

Lab	L97505	L97507	L97508	L97515	L97518
Method	PrioCHECK PRV gB Antibody			IDEXX PRV/ADV gB Ab test	Hipra CIVTEST SUIS ADVgB
R1	4,554	6,857	20,603	0,941	12,052
R2	-8,125	4,126	20,603	0,896	-1,059
R3	-3,571	1,942	16,969	0,851	0,489
Mean	-2,381	4,308	19,392	0,896	3,827
SD	6,423	2,463	2,098	0,045	7,165
CV	-269,7%	57,2%	10,8%	5,0%	187,2%

Rn: repetition n

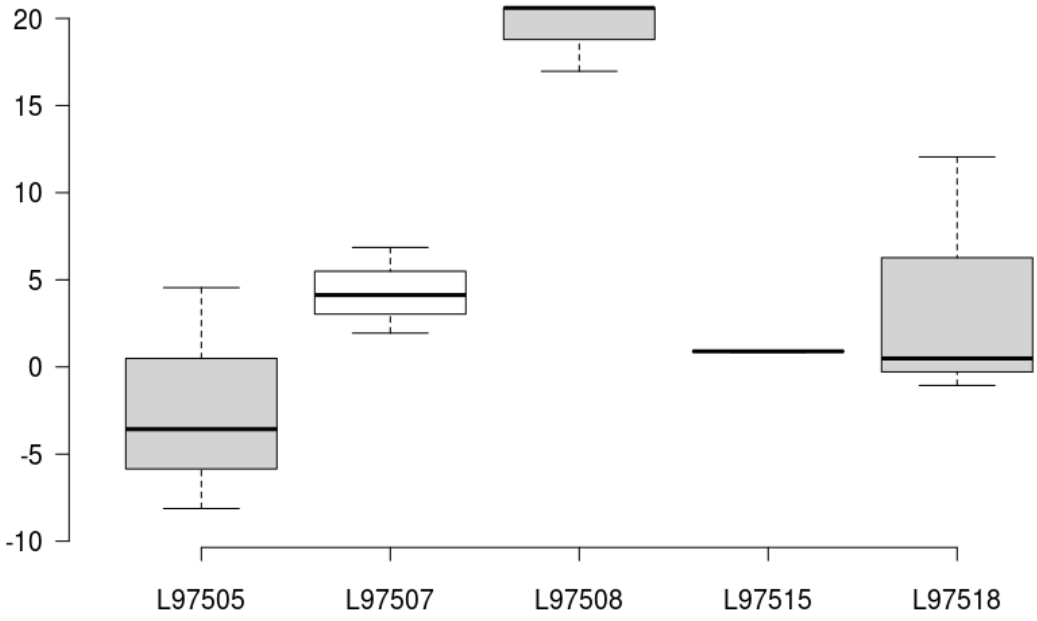


Figure A3. Boxplot dispersion of the results per participant for the sample gBNS3

Sample PT2020AUJELIgBNS4

Table A4. Quantitative normalized values (%)

Lab	L97505	L97507	L97508	L97515	L97518
Method	PrioCHECK PRV gB Antibody			IDEXX PRV/ADV gB Ab test	Hipra CIVTEST SUIS ADVgB
R1	25,00	25,49	32,92	0,55	32,33
R2	22,23	28,16	33,19	0,56	41,37
Mean	23,62	26,82	33,05	0,56	36,85
SD	1,96	1,89	0,19	0,01	6,39
CV	8,29%	7,04%	0,57%	1,88%	17,35%

Rn : repetition n

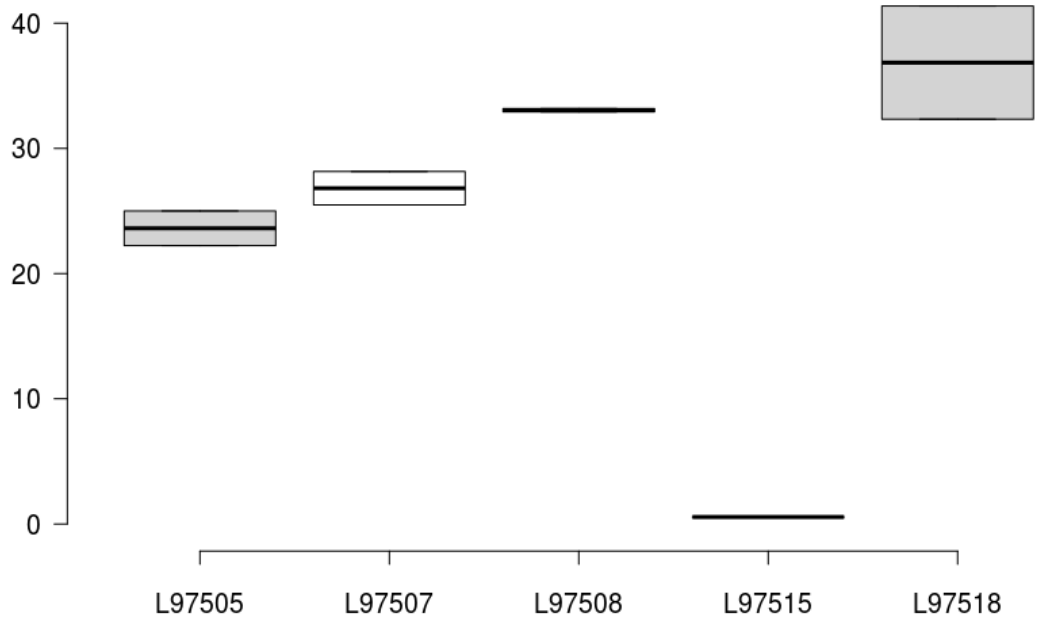


Figure A4. Boxplot dispersion of the results per participant for the sample gBNS4

Sample PT2020AUJELIgBPS1

Table A5. Quantitative normalized values

Lab	L97505	L97507	L97508	L97515	L97518
Method	PrioCHECK PRV gB Antibody			IDEXX PRV/ADV gB Ab test	Hipra CIVTEST SUIS ADVgB
R1	44,20	57,10	53,57	0,21	77,61
R2	49,46	52,73	54,63	0,26	71,91
Mean	46,83	54,92	54,10	0,23	74,76
SD	3,72	3,09	0,75	0,04	4,03
CV	7,95%	5,63%	1,39%	15,25%	5,39%

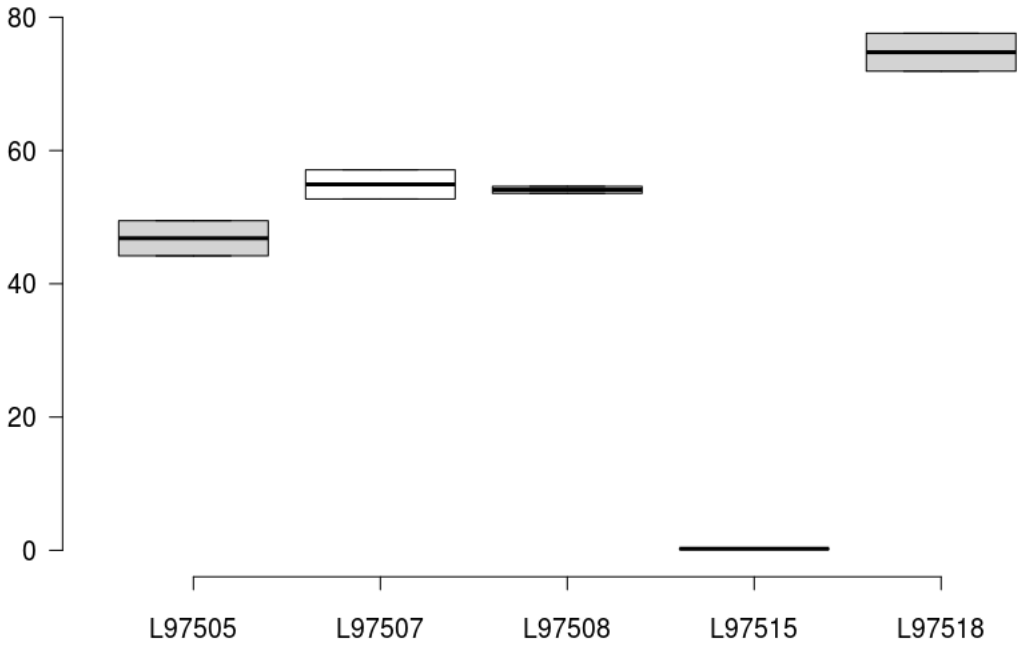


Figure A5. Boxplot dispersion of the results per participant for the sample gBPS1

Sample PT2020AUJELIgBPS2

Table A6. Quantitative normalized values

Lab	L97505	L97507	L97508	L97515	L97518
Method	PrioCHECK PRV gB Antibody			IDEXX PRV/ADV gB Ab test	Hipra CIVTEST SUIS ADVgB
R1	95,27	95,21	95,84	0,06	95,93
R2	95,54	95,51	95,92	0,05	95,52
R3	95,36	95,33	95,66	0,05	95,44
R4	95,63	95,51	95,48	0,04	95,20
Mean	95,45	95,39	95,72	0,05	95,52
SD	0,16	0,15	0,20	0,01	0,30
CV	0,17%	0,16%	0,21%	15,12%	0,32%

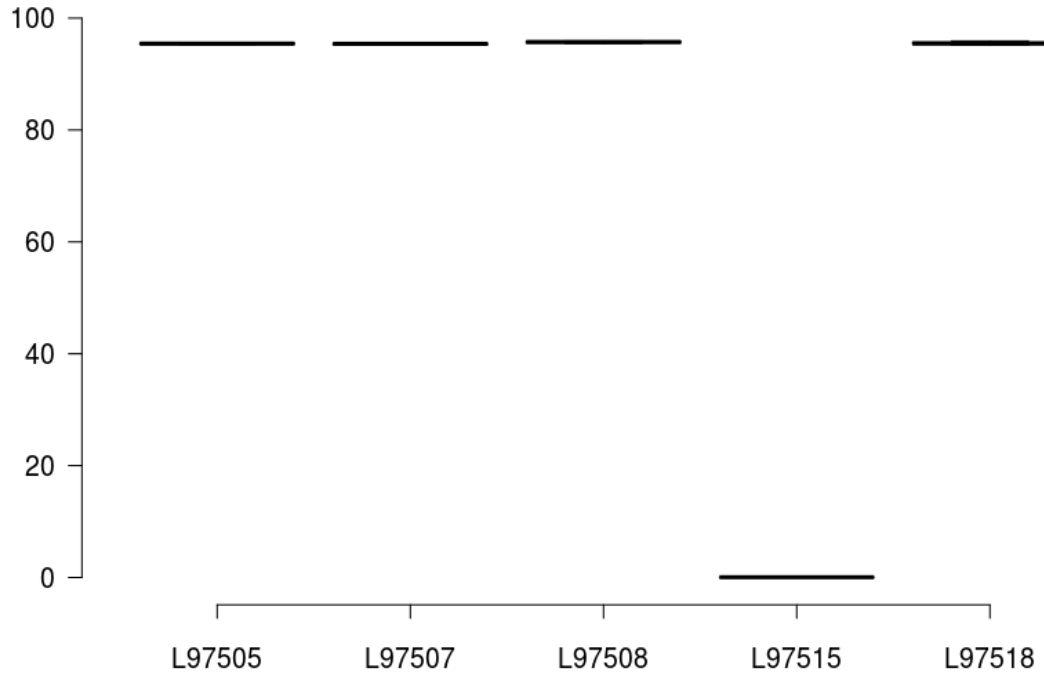


Figure A6. Boxplot dispersion of the results per participant for the sample gBPS2

Sample PT2020AUJELIgBPS3

Table A7. Quantitative normalized values

Lab	L97505	L97507	L97508	L97515	L97518
Method	PrioCHECK PRV gB Antibody			IDEXX PRV/ADV gB Ab test	Hipra CIVTEST SUIS ADVgB
R1	94,20	93,51	92,73	0,06	95,68
R2	94,38	95,33	93,18	0,05	95,44
R3	93,30	93,75	93,09	0,06	95,23
Mean	93,96	94,19	93,00	0,06	95,45
SD	0,57	0,99	0,23	0,00	0,23
CV	0,61%	1,05%	0,25%	6,06%	0,24%

Rn: repetition n

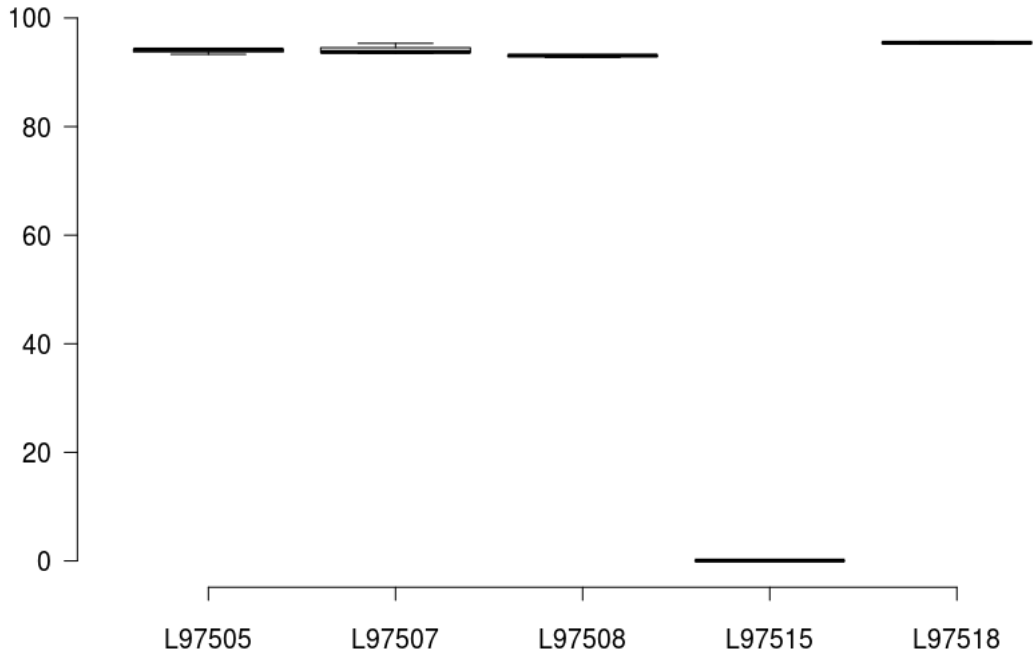


Figure A7. Boxplot dispersion of the results per participant for the sample gBPS3.

Annex 2. Quantitative results for gE serology

Sample PT2020AUJELIgENS1

Table A8. Quantitative normalized values

Lab	L97505	L97507	L97509	L97515	L97508	L97516	L97518
Method	Idexx PRV/ADV gI Ab test						Hipra CIVTEST SUIS ADVgE
R1	-1,544	-14,522	1,531	2,553	1,283	6,096	4,834
R2	-3,382	-15,541	-0,161	1,720	1,796	12,521	3,886
R3	1,691	-7,261	-1,209	4,329	1,591	-2,059	9,858
Mean	-1,078	-12,442	0,054	2,867	1,557	5,519	6,193
SD	2,097	3,687	1,129	1,088	0,211	5,966	2,620
CV	-194,5%	-29,6%	2101,2%	37,9%	13,5%	108,1%	42,3%

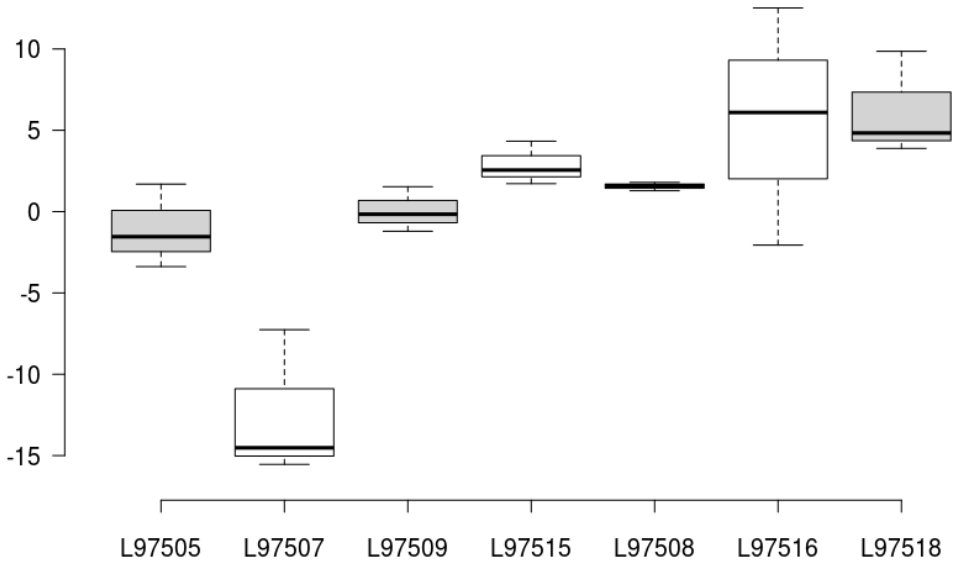


Figure A8. Boxplot dispersion of the results per participant for the sample gENS1

Sample PT2020AUJELIgENS2

Table A9. Quantitative normalized values

Lab	L97505	L97507	L97509	L97515	L97508	L97516	L97518
Method	Idexx PRV/ADV gI Ab test						Hipra CIVTEST SUIS ADVgE
R1	-4,56	-7,26	-5,48	3,44	-6,11	5,19	9,10
R2	3,09	-5,22	0,56	-3,72	-3,44	5,35	6,64
R3	5,96	-11,21	-1,37	-2,66	0,46	0,25	8,82
Mean	1,50	-7,90	-2,10	-0,98	-3,03	3,60	8,18
SD	5,44	3,04	3,09	3,86	3,30	2,90	1,35
CV	363,5%	-38,5%	-147,3%	-394,2%	-109,1%	80,7%	16,5%

Rn : repetition n

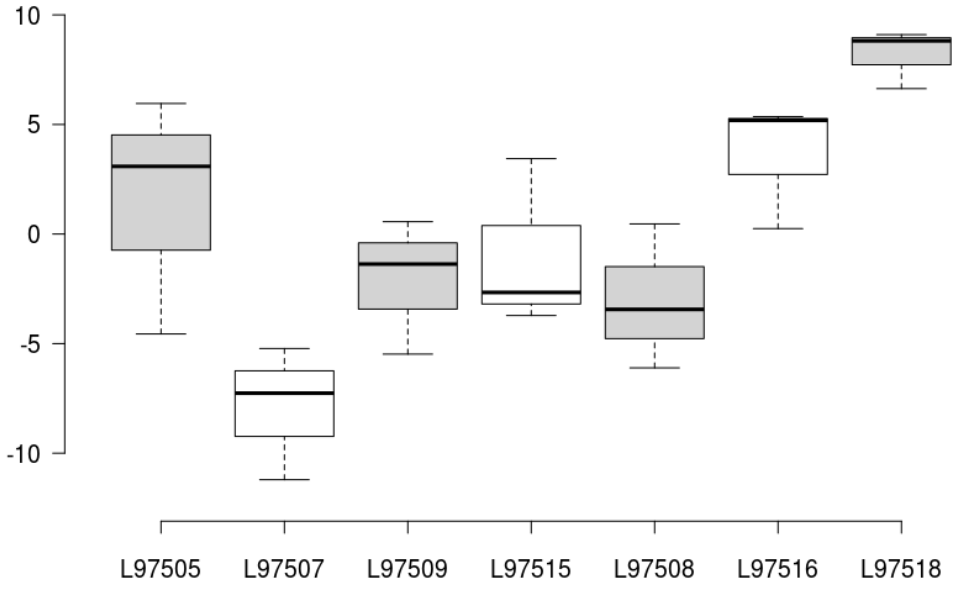


Figure A9. Boxplot dispersion of the results per participant for the sample gENS2

Table A10. Quantitative normalized values

Lab	L97505	L97507	L97509	L97515	L97508	L97516	L97518
Method	Idexx PRV/ADV gI Ab test						Hipra CIVTEST SUIS ADVgE
R1	1,91	-6,62	-2,26	4,22	3,13	4,45	3,41
R2	1,03	-14,78	2,26	2,61	-3,13	-0,74	4,17
R3	-18,82	-12,36	2,10	0,11	-1,18	-2,14	1,90
Mean	-5,29	-11,25	0,70	2,31	-0,39	0,52	3,16
SD	11,73	4,19	2,56	2,07	3,20	3,47	1,16
CV	-221,5%	-37,2%	366,6%	89,5%	-814,4%	665,5%	36,7%

Rn : repetition n

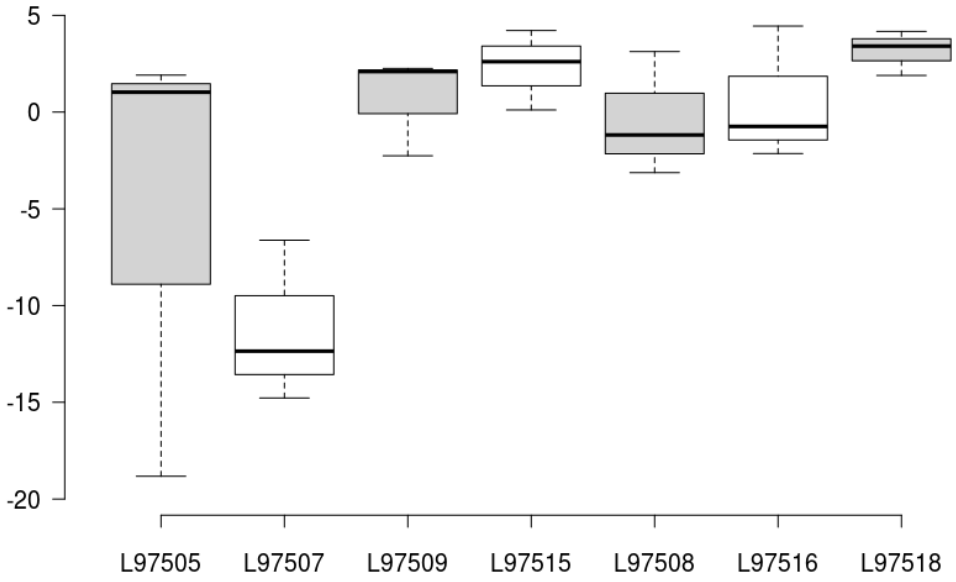


Figure A10. Boxplot dispersion of the results per participant for the sample gENS3

Sample PT2020AUJELIgEPS1

Table A11. Quantitative normalized values

Lab	L97505	L97507	L97509	L97515	L97508	L97516	L97518
Method	Idexx PRV/ADV gI Ab test						Hipra CIVTEST SUIS ADVgE
R1	69,41	62,17	64,46	74,92	65,62	66,64	51,66
R2	63,90	51,34	62,93	75,19	64,08	56,43	56,78
R3	63,38	61,02	66,16	73,97	63,16	67,96	57,16
R4	66,18	64,33	64,79	74,14	63,78	68,53	57,82
Mean	65,72	59,71	64,59	74,56	64,16	64,89	55,85
SD	2,75	5,75	1,32	0,59	1,05	5,70	2,83
CV	4,18%	9,63%	2,05%	0,79%	1,63%	8,78%	5,07%

Rn : repetition n

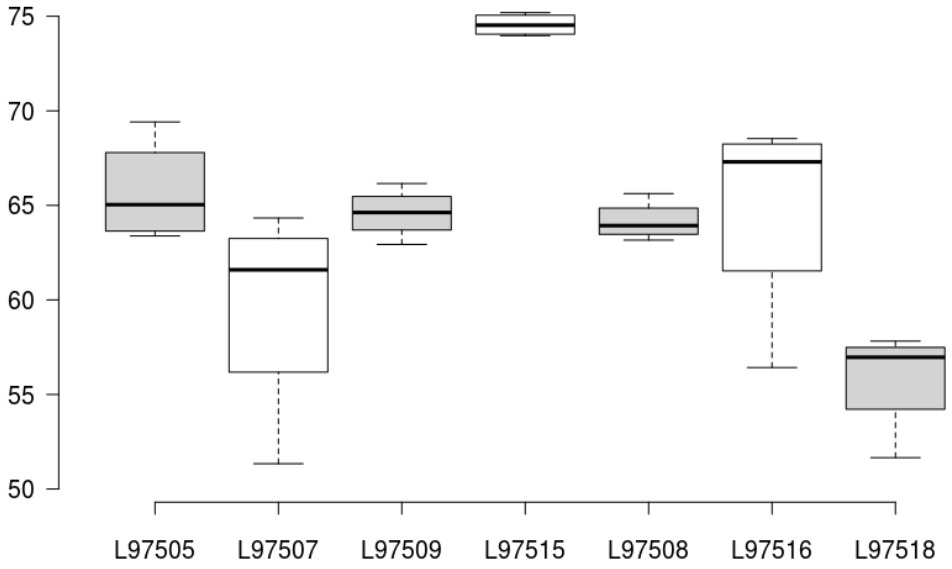


Table A11. Boxplot dispersion of the results per participant for the sample gEPS1

Sample PT2020AUJELIgEPS2

Table A12. Quantitative normalized values

Lab	L97505	L97507	L97509	L97515	L97508	L97516	L97518
Method	Idexx PRV/ADV gI Ab test						Hipra CIVTEST SUIS ADVgE
R1	95,81	90,32	95,00	94,95	93,13	95,39	94,50
R2	95,59	90,45	94,92	95,06	93,23	94,15	94,31
R3	95,81	91,97	95,33	94,62	93,43	94,56	93,65
Mean	95,74	90,91	95,08	94,88	93,26	94,70	94,15
SD	0,13	0,92	0,21	0,23	0,16	0,63	0,45
CV	0,13%	1,01%	0,22%	0,24%	0,17%	0,66%	0,48%

Rn : repetition n

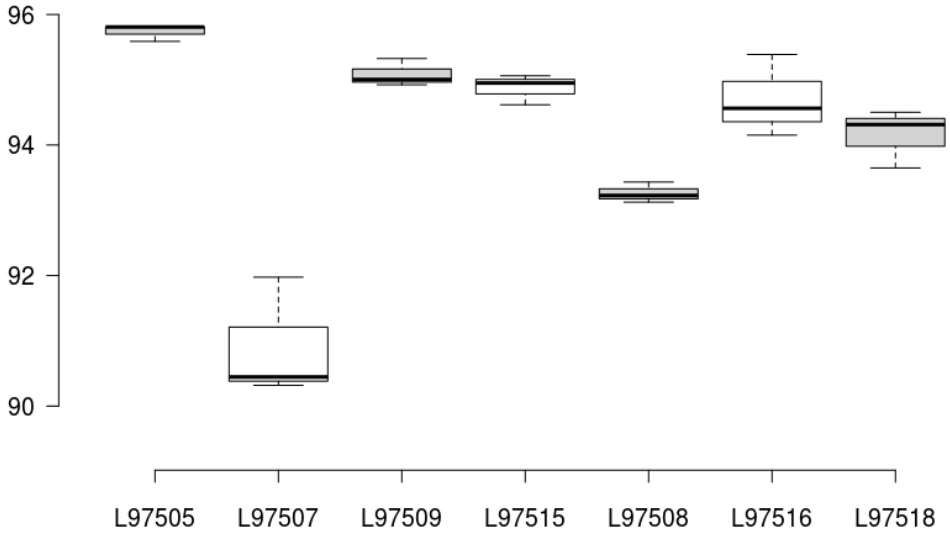


Figure A12. Boxplot dispersion of the results per participant for the sample gEPS2

Sample PT2020AUJELIgEPS3

Table A13. Quantitative normalized values

Lab	L97505	L97507	L97509	L97515	L97508	L97516	L97518
Method	Idexx PRV/ADV gI Ab test						Hipra CIVTEST SUIS ADVgE
R1	88,46	85,61	86,06	90,90	86,15	83,44	72,80
R2	89,12	86,24	86,30	91,34	86,46	79,65	69,10
R3	88,75	85,86	87,03	91,56	86,56	84,84	70,71
R4	89,49	87,13	85,98	91,51	86,04	84,51	75,36
Mean	88,95	86,21	86,34	91,33	86,30	83,11	71,99
SD	0,45	0,67	0,48	0,30	0,24	2,38	2,71
CV	0,50%	0,78%	0,55%	0,33%	0,28%	2,87%	3,76%

Rn : repetition n

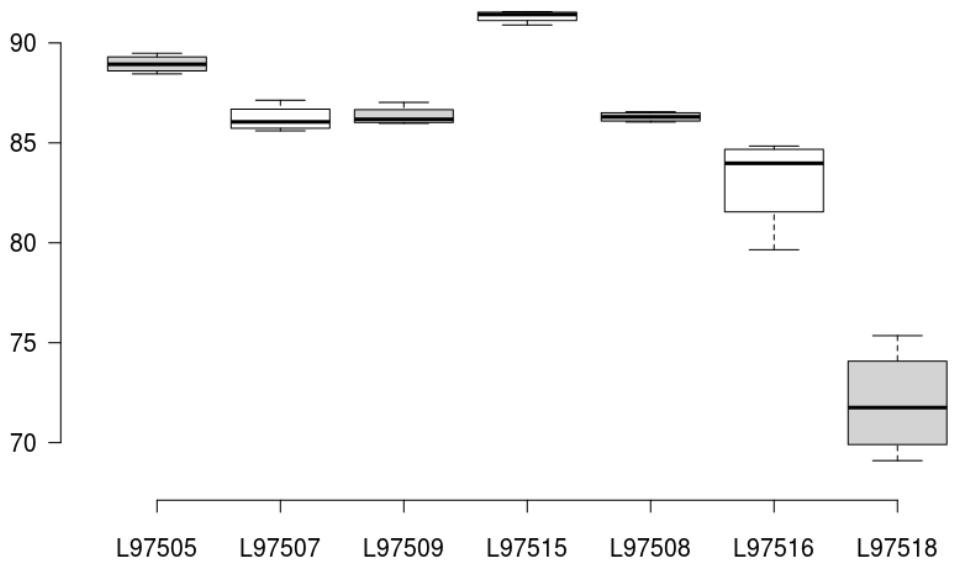


Figure A13. Boxplot dispersion of the results per participant for the sample gEPS3

Annex 3: additionnal 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:

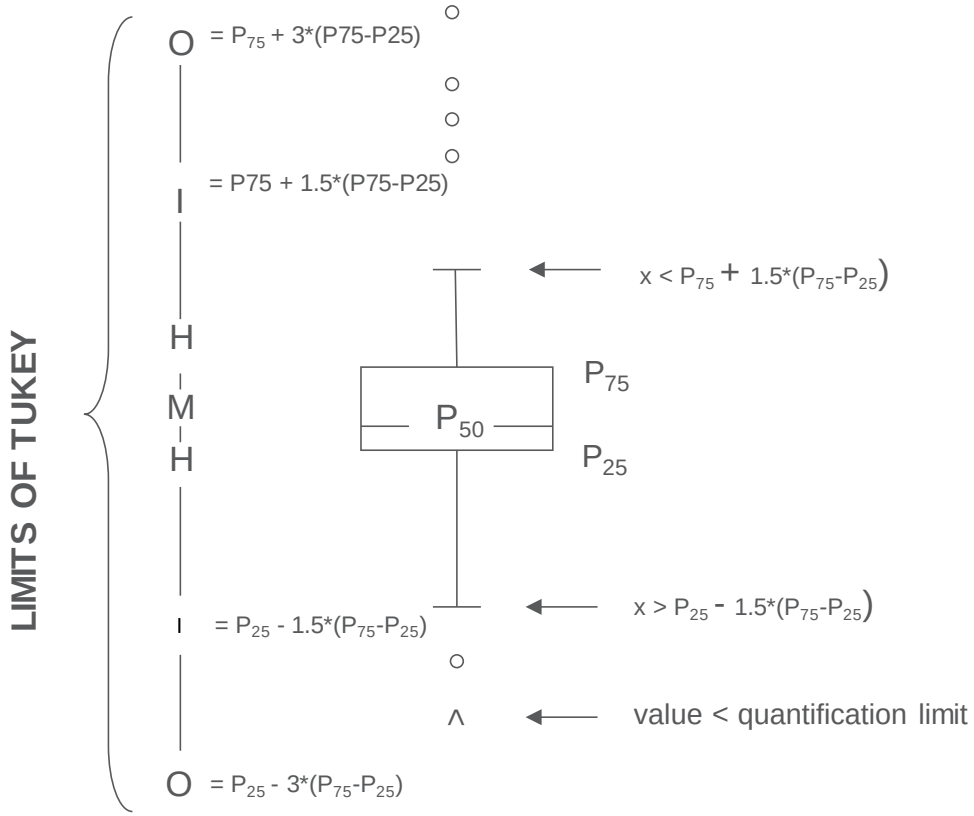
The link is:

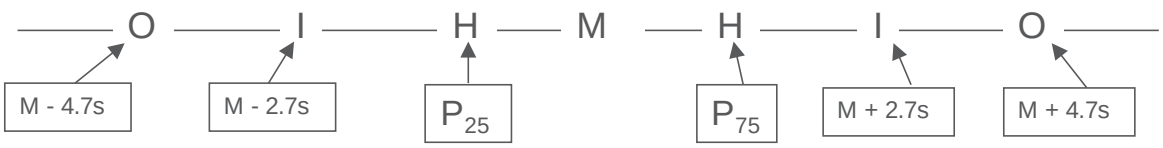
https://www.wiv-isp.be/QML/activities/external_quality/calendar/calender_PT%20VET/_fr/Calendrier_2020-PT%20VET%202.htm

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

END