BIOLOGICAL HEALTH RISKS
QUALITY OF LABORATORIES

COMMITEE OF EXPERTS

PROFICIENCY TEST
IN VETERINARY DIAGNOSIS

DEFINITIVE GLOBAL REPORT

VETERINARY MEDICINE

INFECTIOUS BOVINE RHINOTRACHEITIS (IBR)

PROFICIENCY TEST 2023-7

CORRECTED VERSION

Sciensano/PT VET IBR/2023-7/E/CV
Biological health risks
Quality of laboratories
J. Wytsmanstreet, 14
1050 Brussels | Belgium

www.sciensano.be

ISSN: 2294-3498

COMMITTEE OF EXPERTS
NATIONAL REFERENCE LABORATORIES

Sciensano					
Secretariat		Phone:	02/642.55.22	Fax:	02/642.56.45
		E-mail	ql_secretariat@sciensano.be		
Ynse Van de Maele	PT VET coordinator	Phone:	02/642 55 24		
		E-mail:	Ynse.vandemaele@sciensano.be		
Bernard China	Alternate PT VET coordinator	Phone:	02/642 53 85		
		E-mail:	Bernard.china@sciensano.be		
Experts	**Institute**				
Gaëtan De Gryse	Sciensano				
Marylene Tignon	Sciensano				

A draft version of this report was submitted to the expert(s) on 08/11/2023.

Adjustments have been made on pages 13, 19 and 20. The changes have been marked in blue.

This report replaces the previous version of the global report of 27/11/2023.

Authorization of the report: by Ynse Van de Maele, PT VET coordinator

Date of publication: 29/11/2023

All the reports are also available on our webpage:

- NL: https://www.sciensano.be/nl/kwaliteit-van-laboratoria
- FR: https://www.sciensano.be/fr/qualite-des-laboratoires
- EN: https://www.sciensano.be/en/quality-laboratories

TABLE OF CONTENTS

1 INTRODUCTION

Details relevant to the proficiency test (PT) are available in the procedure SOP 2.5/01 'Management of the proficiency tests organized by the scientific directorate infectious diseases in animals'. The PT was organized according to the ISO17043 'Conformity assessment - General requirements for proficiency testing' norm.

2 AIM

The aim of the PT Infectious Bovine Rhinotracheitis (serology) was to evaluate the ability of the participating laboratories to detect the absence or presence of antibodies against infectious bovine disease (IBR) viruses in both serum (gB/gE) and milk (gB/gE) of ruminants, using ELISA.

3 MATERIALS AND METHODS

3.1 Serology (serum gB)

3.1.1 THE PARTICIPANTS

Seven laboratories participated in the proficiency test of Infectious Bovine Rhinotracheitis serology on serum gB. The names of the participating laboratories are:

- Sciensano, department of Enzootic, vector-borne and bee diseases
- ARSIA
- Dierengezondheidszorg Vlaanderen (DGZ)
- LAVETAN
- LNCR / ACSEDIATE
- Laboratoire de Médecine Vétérinaire de l'Etat (LMVE)
- Poulpharm

3.1.2 THE SAMPLES

The samples (liquid sera) were prepared by the National Reference Laboratory (NRL), department of Enzootic, vector-borne and bee diseases, Sciensano. Participants were instructed to store the samples at 4 °C until the analysis was carried out.

Samples originate from the field or from experimentation and were harvested from collected blood before aliquotation and freezing.

3.1.3 HOMOGENEITY

The homogeneity of the samples was tested by the NRL on 3 aliquots (250 µl) of each sample using ELISA before and after the PT.

For the laboratory, the criterion to consider that the homogeneity are correct is when the coefficient of variation (CV) between the 3 values is < 15%.

3.1.4 TARGET VALUES

The target values were determined by the NRL based on the homogeneity tests. The panel consisted of seven different samples. However, positive samples PS1, PS2 and PS3 were was replicated twee times. Therefore, the panel included 10 samples in total.

Sample content	Repetition	Expected result
PT2023IBRgBSERPS1	2	POS
PT2023IBRgBSERPS2	2	POS
PT2023IBRgBSERPS3	2	POS/NEG/NI*
PT2023IBRgBSERPS4	1	POS
PT2023IBRgBSERNS1	1	NEG
PT2023IBRgBSERNS2	1	NEG
PT2023IBRgBSERNS3	1	NEG

(POS = positive; NEG = negative; NI = not interpretable)

* = The positive sample PS3 represents a positive sample diluted to the limit of detection, implying that the result can be doubtful. Therefore, for this sample, POS, NEG or NI are accepted as correct results.

3.1.5 STABILITY

The criterion for stability is that the status of the sample in Post-PT remains the status assigned in pre-PT test. The stability check was conform.

3.1.6 RANDOMISATION AND PANEL COMPOSITION

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

Sample ID: PT2023 IBRgBSER	97505	97507	97508	97509
PS1 (1)	IBRSERgB23-1	IBRSERgB23-4	IBRSERgB23-5	IBRSERgB23-6
PS1 (2)	IBRSERgB23-8	IBRSERgB23-9	IBRSERgB23-9	IBRSERgB23-7
PS2 (1)	IBRSERgB23-4	IBRSERgB23-3	IBRSERgB23-1	IBRSERgB23-2
PS2 (2)	IBRSERgB23-10	IBRSERgB23-6	IBRSERgB23-8	IBRSERgB23-9
PS3 (1)	IBRSERgB23-5	IBRSERgB23-8	IBRSERgB23-4	IBRSERgB23-3
PS3 (2)	IBRSERgB23-6	IBRSERgB23-10	IBRSERgB23-6	IBRSERgB23-8
PS4	IBRSERgB23-9	IBRSERgB23-5	IBRSERgB23-2	IBRSERgB23-1
NS1	IBRSERgB23-2	IBRSERgB23-2	IBRSERgB23-10	IBRSERgB23-10
NS2	IBRSERgB23-7	IBRSERgB23-7	IBRSERgB23-7	IBRSERgB23-4
NS3	IBRSERgB23-3	IBRSERgB23-1	IBRSERgB23-3	IBRSERgB23-5

Sample ID: PT2023 IBRgBSER	97510	97516	97540
PS1 (1)	IBRSERgB23-5	IBRSERgB23-7	IBRSERgB23-1
PS1 (2)	IBRSERgB23-6	IBRSERgB23-9	IBRSERgB23-10
PS2 (1)	IBRSERgB23-4	IBRSERgB23-8	IBRSERgB23-3
PS2 (2)	IBRSERgB23-8	IBRSERgB23-10	IBRSERgB23-7
PS3 (1)	IBRSERgB23-7	IBRSERgB23-1	IBRSERgB23-2
PS3 (2)	IBRSERgB23-9	IBRSERgB23-3	IBRSERgB23-4
PS4	IBRSERgB23-10	IBRSERgB23-4	IBRSERgB23-5
NS1	IBRSERgB23-1	IBRSERgB23-5	IBRSERgB23-8
NS2	IBRSERgB23-3	IBRSERgB23-6	IBRSERgB23-9
NS3	IBRSERgB23-2	IBRSERgB23-2	IBRSERgB23-6

3.2 Serology (serum gE)

3.2.1 THE PARTICIPANTS

Nine laboratories participated in the proficiency test of Infectious Bovine Rhinotracheitis serology on serum gE. The names of the participating laboratories are:

- Sciensano, department of Enzootic, vector-borne and bee diseases
- ARSIA
- Dierengezondheidszorg Vlaanderen (DGZ)
- LAVETAN
- ANSES Unité Pathologie et Bien-être des ruminants (PBER)-Site de Niort
- Laboratoire de Médecine Vétérinaire de l'Etat (LMVE)
- IDVET - France (Grabels)
- Poulpharm
- Laboratoire Départemental d'Analyses de l'Ain - Site santé animale

3.2.2 THE SAMPLES

The samples (liquid sera) were prepared by the National Reference Laboratory (NRL), department of Enzootic, vector-borne and bee diseases, Sciensano. Participants were instructed to store the samples at 4 °C until the analysis was carried out.

Information about the **origin** of the samples:

- Samples originate from the field or from experimentation

Information about the **preparation** of the samples:

- Serum was harvested from collected blood before aliquotation and freezing.

3.2.3 HOMOGENEITY

The homogeneity of the samples was tested by the NRL on 3 aliquots (250 µl) of each sample using ELISA before and after the PT. The samples were considered as homogeneous.
For the laboratory, the criterion to consider that the homogeneity are correct is when the coefficient of variation (CV) between the 3 values is < 15%.

3.2.4 TARGET VALUES

The target values were determined by the NRL based on the homogeneity tests. The panel consisted of six different samples. However, positive samples PS1 and PS2 were replicated two times. Additionally, negative samples NS1 and NS2 were repeated two times. Therefore, the panel included 10 samples in total.

Sample content	Repetition	Expected result
PT2023IBRgESERPS1	2	POS
PT2023IBRgESERPS2	2	POS
PT2023IBRgESERPS3	1	POS
PT2023IBRgESERNS1	2	NEG
PT2023IBRgESERNS2	2	NEG
PT2023IBRgESERNS3	1	NEG

(POS = positive; NEG = negative)

3.2.5 STABILITY

The criterion for stability is that the status of the sample in Post-PT remains the status assigned in pre-PT test. The stability check was conform.

3.2.6 RANDOMISATION AND PANEL COMPOSITION

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

Sample ID: PT2023 IBRgESER	97505	97507	97508	97509	97513
PS1 (1)	IBRSERgE23-4	IBRSERgE23-2	IBRSERgE23-6	IBRSERgE23-9	IBRSERgE23-6
PS1 (2)	IBRSERgE23-6	IBRSERgE23-4	IBRSERgE23-10	IBRSERgE23-10	IBRSERgE23-10
PS2 (1)	IBRSERgE23-1	IBRSERgE23-1	IBRSERgE23-1	IBRSERgE23-1	IBRSERgE23-8
PS2 (2)	IBRSERgE23-8	IBRSERgE23-7	IBRSERgE23-3	IBRSERgE23-5	IBRSERgE23-9
PS3	IBRSERgE23-5	IBRSERgE23-3	IBRSERgE23-5	IBRSERgE23-4	IBRSERgE23-5
NS1 (1)	IBRSERgE23-3	IBRSERgE23-6	IBRSERgE23-2	IBRSERgE23-2	IBRSERgE23-2
NS1 (2)	IBRSERgE23-7	IBRSERgE23-10	IBRSERgE23-9	IBRSERgE23-3	IBRSERgE23-3
NS2 (1)	IBRSERgE23-2	IBRSERgE23-5	IBRSERgE23-4	IBRSERgE23-6	IBRSERgE23-1
NS2 (2)	IBRSERgE23-10	IBRSERgE23-9	IBRSERgE23-8	IBRSERgE23-8	IBRSERgE23-4
NS3	IBRSERgE23-9	IBRSERgE23-8	IBRSERgE23-7	IBRSERgE23-7	IBRSERgE23-7

Sample ID: PT2023 IBRgESER	97516	97522	97540	97548
PS1 (1)	IBRSERgE23-4	IBRSERgE23-2	IBRSERgE23-2	IBRSERgE23-1
PS1 (2)	IBRSERgE23-8	IBRSERgE23-3	IBRSERgE23-9	IBRSERgE23-10
PS2 (1)	IBRSERgE23-1	IBRSERgE23-10	IBRSERgE23-8	IBRSERgE23-3
PS2 (2)	IBRSERgE23-6	IBRSERgE23-1	IBRSERgE23-10	IBRSERgE23-9
PS3	IBRSERgE23-2	IBRSERgE23-6	IBRSERgE23-5	IBRSERgE23-4
NS1 (1)	IBRSERgE23-5	IBRSERgE23-4	IBRSERgE23-1	IBRSERgE23-6
NS1 (2)	IBRSERgE23-7	IBRSERgE23-8	IBRSERgE23-6	IBRSERgE23-7
NS2 (1)	IBRSERgE23-9	IBRSERgE23-5	IBRSERgE23-3	IBRSERgE23-2
NS2 (2)	IBRSERgE23-10	IBRSERgE23-9	IBRSERgE23-7	IBRSERgE23-5
NS3	IBRSERgE23-3	IBRSERgE23-7	IBRSERgE23-4	IBRSERgE23-8

3.3 Serology (milk gB)

3.3.1 THE PARTICIPANTS

Four laboratories participated in the proficiency test of Infectious Bovine Rhinotracheitis serology on milk gB. The names of the participating laboratories are:

- Sciensano, department of Enzootic, vector-borne and bee diseases
- LAVETAN
- MCC-Vlaanderen
- Comité du Lait

3.3.2 THE SAMPLES

The samples (lyophilized milk gB) were prepared by the National Reference Laboratory (NRL), department of Enzootic, vector-borne and bee diseases, Sciensano. Participants were instructed to reconstitute the milk with 1 ml of demineralized water at +/- 30°C, incubate the sample for 20 minutes at room temperature and then place the vial on a stirrer for 3 to 4 hours in order to allow full rehydratation. Thereafter, participants were asked to homogenize the sample by vortexing. Storage method of the samples: 20°C ± 5°C. Reconstituted milk: 5°C ± 3°C for 7 days.

Information about the **origin** of the samples:

- Samples originate from the field or from experimentation

Information about the **preparation** of the samples:

- Serum was harvested from collected blood before aliquotation and freezing.

3.3.3 HOMOGENEITY

The homogeneity of the samples was tested by the NRL on 3 aliquots (1 ml) of each sample using ELISA before and after the PT. The samples were considered as homogeneous.
For the laboratory, the criterion to consider that the homogeneity are correct is when the coefficient of variation (CV) between the 3 values is < 15%.

3.3.4 TARGET VALUES

The target values were determined by the NRL based on the homogeneity tests. The panel consisted of nice different samples. However, PM3 was replicated two times. Therefore, the panel included 10 samples in total.

Sample content	Repetition	Expected result
PT2023IBRgBSERPM1	1	POS
PT2023IBRgBSERPM2	1	POS
PT2023IBRgBSERPM3	2	POS
PT2023IBRgBSERPM4	1	POS
PT2023IBRgBSERNM1	1	NEG
PT2023IBRgBSERNM2	1	NEG
PT2023IBRgBSERNM3	1	NEG
PT2023IBRgBSERNM4	1	NEG
PT2023IBRgBSERNM5	1	NEG

(POS = positive; NEG = negative)

3.3.5 STABILITY

The criterion for stability is that the status of the sample in Post-PT remains the status assigned in pre-PT test. The stability check was conform.

3.3.6 RANDOMISATION AND PANEL COMPOSITION

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

Sample ID: PT2023 IBRgBSER	97505	97509	97511	97512
PM1	IBRMILgB23-9	IBRMILgB23-4	IBRMILgB23-5	IBRMILgB23-5
PM2	IBRMILgB23-3	IBRMILgB23-3	IBRMILgB23-3	IBRMILgB23-9
PM3 (1)	IBRMILgB23-5	IBRMILgB23-6	IBRMILgB23-2	IBRMILgB23-6
PM3 (2)	IBRMILgB23-7	IBRMILgB23-7	IBRMILgB23-10	IBRMILgB23-8
PM4	IBRMILgB23-2	IBRMILgB23-5	IBRMILgB23-1	IBRMILgB23-2
NM1	IBRMILgB23-6	IBRMILgB23-2	IBRMILgB23-8	IBRMILgB23-3
NM2	IBRMILgB23-8	IBRMILgB23-9	IBRMILgB23-9	IBRMILgB23-7
NM3	IBRMILgB23-1	IBRMILgB23-1	IBRMILgB23-4	IBRMILgB23-1
NM4	IBRMILgB23-10	IBRMILgB23-8	IBRMILgB23-6	IBRMILgB23-10
NM5	IBRMILgB23-4	IBRMILgB23-10	IBRMILgB23-7	IBRMILgB23-4

3.4 Serology (milk gE)

3.4.1 THE PARTICIPANTS

Five laboratories participated in the proficiency test of Infectious Bovine Rhinotracheitis serology on milk gE. The names of the participating laboratories are:

- Sciensano, department of Enzootic, vector-borne and bee diseases
- LAVETAN
- MCC-Vlaanderen
- Comité du Lait
- IN3 DIAGNOSTIC SRL

3.4.2 THE SAMPLES

The samples (lyophilized milk gE) were prepared by the National Reference Laboratory (NRL), department of Enzootic, vector-borne and bee diseases, Sciensano. Participants were instructed to reconstitute the milk with 1 ml of demineralized water at +/- 30°C, incubate the sample for 20 minutes at room temperature and then place the vial on a stirrer for 3 to 4 hours in order to allow full rehydratation. Thereafter, participants were asked to homogenize the sample by vortexing. Storage method of the samples: 20°C ± 5°C. Reconstituted milk: 5°C ± 3°C for 7 days.

Information about the **origin** of the samples:

- Samples originate from the field or from experimentation

Information about the **preparation** of the samples:

- Serum was harvested from collected bulk milk before aliquotation and freezing.

3.4.3 HOMOGENEITY

The homogeneity of the samples was tested by the NRL on 3 aliquots (1 ml) of each sample using ELISA before and after the PT. The samples were considered as homogeneous.
For the laboratory, the criterion to consider that the homogeneity are correct is when the coefficient of variation (CV) between the 3 values is < 15%.

3.4.4 TARGET VALUES

The target values were determined by the NRL based on the homogeneity tests. The panel consisted of 10 different samples. No repetitions were included.

Sample content	Repetition	Expected result
PT2023IBRgESERPM1	1	POS
PT2023IBRgESERPM2	1	POS
PT2023IBRgESERPM3	1	POS
PT2023IBRgESERPM4	1	POS
PT2023IBRgESERPM5	1	POS
PT2023IBRgESERNM1	1	NEG
PT2023IBRgESERNM2	1	NEG
PT2023IBRgESERNM3	1	NEG
PT2023IBRgESERNM4	1	NEG
PT2023IBRgESERNM5	1	NEG

(POS = positive; NEG = negative)

3.4.5 STABILITY

The criterion for stability is that the status of the sample in Post-PT remains the status assigned in pre-PT test. The stability check was conform.

3.4.6 RANDOMISATION AND PANEL COMPOSITION

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

Sample ID: PT2023 IBRgESER	97505	97509	97511	97512	97533
PM1	IBRMILgE23-8	IBRMILgE23-4	IBRMILgE23-1	IBRMILgE23-7	IBRMILgE23-10
PM2	IBRMILgE23-1	IBRMILgE23-2	IBRMILgE23-9	IBRMILgE23-10	IBRMILgE23-4
PM3	IBRMILgE23-9	IBRMILgE23-3	IBRMILgE23-5	IBRMILgE23-1	IBRMILgE23-5
PM4	IBRMILgE23-4	IBRMILgE23-6	IBRMILgE23-7	IBRMILgE23-2	IBRMILgE23-2
PM5	IBRMILgE23-6	IBRMILgE23-9	IBRMILgE23-8	IBRMILgE23-8	IBRMILgE23-8
NM1	IBRMILgE23-5	IBRMILgE23-10	IBRMILgE23-6	IBRMILgE23-9	IBRMILgE23-3
NM2	IBRMILgE23-2	IBRMILgE23-7	IBRMILgE23-10	IBRMILgE23-4	IBRMILgE23-1
NM3	IBRMILgE23-3	IBRMILgE23-5	IBRMILgE23-4	IBRMILgE23-6	IBRMILgE23-9
NM4	IBRMILgE23-10	IBRMILgE23-1	IBRMILgE23-2	IBRMILgE23-5	IBRMILgE23-7
NM5	IBRMILgE23-7	IBRMILgE23-8	IBRMILgE23-3	IBRMILgE23-3	IBRMILgE23-6

4 TIMELINE

Transfer of the samples from NRL to QL: 10/07/2023
Randomization of the samples by QL: 11/07/2023
Sending samples to participants: in the week of 17/07/2023
Deadline for submitting the results: 25/08/2023
Individual report to the participants: 04/10/2023

5 RESULTS

5.1 Serology (serum gB)

5.1.1 RESULTS PER SAMPLE

The panel consisted of seven different samples. However, positive samples PS1, PS2 and PS3 were was replicated twee times. Therefore, the panel included 10 samples in total.

Sample ID	Status	Number of repetitions (total results)	Observed result
PS1	POS	2 (14)	14 POS
PS2	POS	2 (14)	14 POS
PS3	POS/NEG/NI	2 (14)	14 POS
PS4	POS	1 (7)	7 POS
NS1	NEG	1 (7)	7 NEG
NS2	NEG	1 (7)	7 NEG
NS3	NEG	1 (7)	7 NEG

(POS = positive; NEG = negative; NI = not interpretable)

5.1.2 USED METHOD

Method	Name producer	Name kit	N	NR	NCR	%
ELISA Indirect	IDEXX	IBR gB X3 Ab	**7**	**70**	**70**	**100**
TOTAL			**7**	**70**	**70**	**100**

(N= number of laboratories; NR = number of results; NCR = number of correct results).

5.1.3 CONCLUSION

In 2023, seven laboratories participated in proficiency test of Infectious Bovine Rhinotracheitis (serology - serum gB) organized by Sciensano. 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 serum samples assigned by the reference laboratory of the Scientific Directorate Infectious Diseases in Animals of Sciensano. All laboratories used the ELISA-kit IBR gB X3 Ab form IDEXX and succeeded in achieving the maximum score (100%) for this test.

5.2 Serology (serum gE)

5.2.1 RESULTS PER SAMPLE

The panel consisted of six different samples. However, positive samples PS1 and PS2 were replicated two times. Additionally, negative samples NS1 and NS2 were repeated two times. Therefore, the panel included 10 samples in total.

Three labs had chosen to test two different methods on the same samples, implying that there were two datasets submitted. These additional results are included in the tables below.

Sample ID	Status	Number of repetitions (total results)	Observed result
PS1	POS	2 (24)	24 POS
PS2	POS	2 (24)	24 POS
PS3	POS	1 (12)	12 POS
NS1	NEG	2 (24)	24 NEG
NS2	NEG	2 (24)	24 NEG
NS3	NEG	1 (12)	12 NEG

(POS = positive; NEG = negative)

5.2.2 USED METHOD

Method	Name producer	Name kit	N	NR	NCR	%
ELISA Competition	IDEXX	gE blocking ELISA	5	50	50	100
ELISA Indirect	IDEXX	Bovine Rhinotracheitis Virus (BHV-1) gE Antibody Test Kit	2	20	20	100
ELISA Competition	ID.VET	ID SCREEN® IBR gE	**5**	**50**	**50**	100
TOTAL			**12**	**120**	**120**	**100**

(N= number of laboratories; NR = number of results; NCR = number of correct results).

5.2.3 CONCLUSION

In 2023, nine laboratories participated in proficiency test of Infectious Bovine Rhinotracheitis (serology - serum gE) organized by Sciensano. 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 serum samples assigned by the reference laboratory of the Scientific Directorate Infectious Diseases in Animals of Sciensano. All laboratories succeeded in achieving the maximum score (100%) for this test.

5.3 Serology (milk gB)

5.3.1 RESULTS PER SAMPLE

The panel consisted of nice different samples. However, PM3 was replicated two times. Therefore, the panel included 10 samples in total.

Sample ID	Status	Number of repetitions (total results)	Observed result
PS1	POS	1 (4)	4 POS
PS2	POS	1 (4)	4 POS
PS3	POS	2 (8)	8 POS
PS4	POS	1 (4)	4 POS
NS1	NEG	1 (4)	4 NEG
NS2	NEG	1 (4)	4 NEG
NS3	NEG	1 (4)	4 NEG
NS4	NEG	1 (4)	4 NEG
NS5	NEG	1 (4)	4 NEG

(POS = positive; NEG = negative)

5.3.2 USED METHOD

Method	Name producer	Name kit	N	NR	NCR	%
ELISA Indirect	ID.VET	ID SCREEN® IBR MILK gB INDIRECT	**1**	**10**	**10**	**100**
ELISA Indirect	Indical (Qiagen)	Cattletype BHV1 gB Ab milk	**3**	**30**	**30**	**100**
TOTAL			**4**	**40**	**40**	**100**

(N= number of laboratories; NR = number of results; NCR = number of correct results).

5.3.3 CONCLUSION

In 2023, four laboratories participated in proficiency test of Infectious Bovine Rhinotracheitis (serology - milk gB) organized by Sciensano. 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 serum samples assigned by the reference laboratory of the Scientific Directorate Infectious Diseases in Animals of Sciensano. All laboratories succeeded in achieving the maximum score (100%) for this test.

5.4 Serology (milk gE)

5.4.1 RESULTS PER SAMPLE

The panel consisted of 10 different samples. No repetitions were included.

Sample ID	Status	Number of repetitions (total results)	Observed result
PM1	POS	1 (5)	5 POS
PM2	POS	1 (5)	5 POS
PM3	POS	1 (5)	5 POS
PM4	POS	1 (5)	4 POS 1 NEG
PM5	POS	1 (5)	4 POS 1 NEG
NM1	NEG	1 (5)	5 NEG
NM2	NEG	1 (5)	5 NEG
NM3	NEG	1 (5)	5 NEG
NM4	NEG	1 (5)	5 NEG
NM5	NEG	1 (5)	5 NEG

(POS = positive; NEG = negative)

5.4.2 USED METHOD

Method	Name producer	Name kit	N	NR	NCR	%
ELISA Indirect	IN3 Diagnostic	Eradikit BoHV1 gE	**5**	**50**	**48**	**96**
TOTAL			**5**	**50**	**48**	**96**

(N= number of laboratories; NR = number of results; NCR = number of correct results).

5.4.3 CONCLUSION

In 2023, five laboratories participated in proficiency test of Infectious Bovine Rhinotracheitis (serology - milk gE) organized by Sciensano. 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 serum samples assigned by the reference laboratory of the Scientific Directorate Infectious Diseases in Animals of Sciensano. All laboratories used the ELISA-kit Eradikit BoHV1 gE form IN3 Diagnostic. Four laboratories achieved the maximum score of 100% for this test. One laboratory achieved a score of 80%, which is below the minimum score of 90%, giving this laboratory an unsatisfactory result. An overall score of 96% was achieved

6 ANNEXES (NOT UNDER ACCREDITATION)

The boxplots, shown down below, were created by using the following software programme: shiny.chemgrid.org/boxplotr/

6.1 Annex 1: Quantitative results

6.1.1 SEROLOGY (SERUM GB)

PT2023IBRgBSERPS1

Lab number	97505	97507	97508	97509	97510	97516	97540
Method	IDEXX - IBR gB X3 Ab						
OD (REP1)	0,059	0,050	0,054	0,072	0,024	0,12	0,096
OD (REP2)	0,062	0,045	0,044	0,073	0,025	0,13	0,098
Mean	0,061	0,048	0,049	0,073	0,025	0,12	0,10
SD	0,0021	0,0035	0,0071	0,00071	0,00071	0,011	0,0014
CV (%)	3,51	7,44	14,43	0,98	2,89	8,66	1,46

Numbers were rounded to 2 significant decimal place. (OD = optical density; REP = repetition; SD = standard deviation; CV = coefficient of variation).

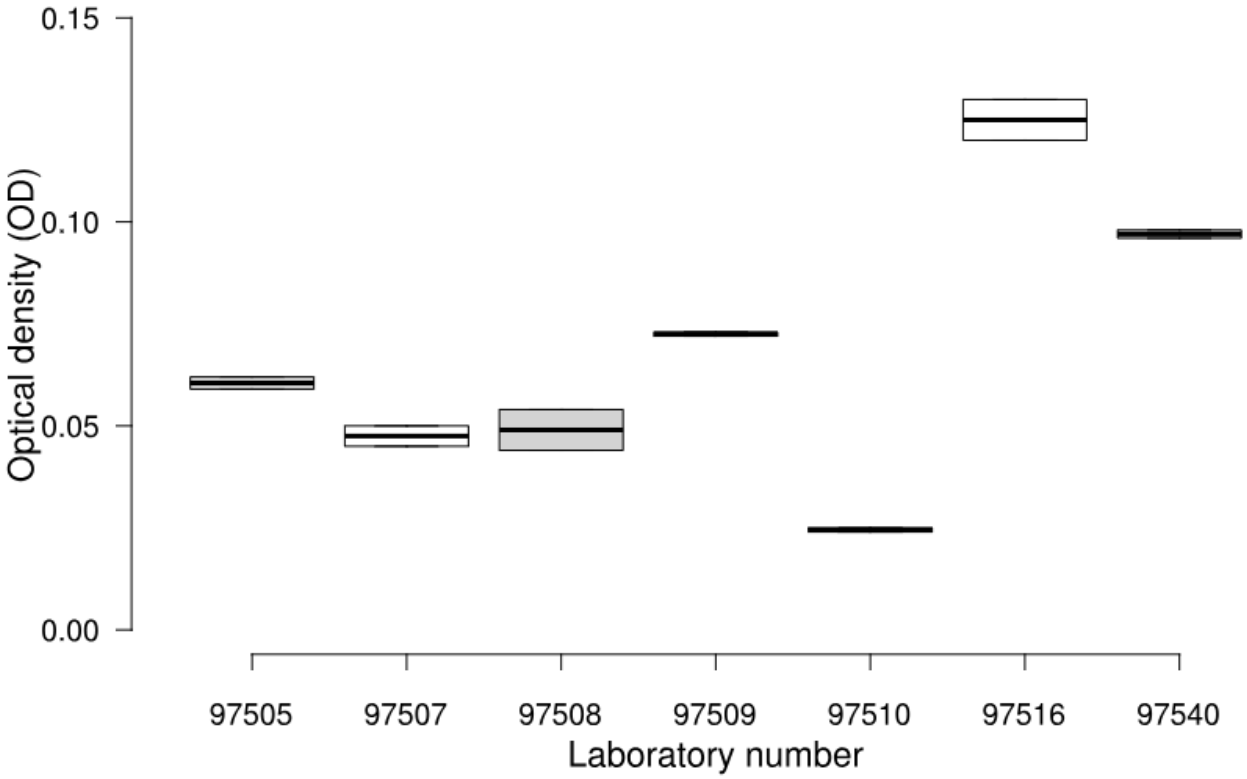


Figure 1. Distribution of the optical densities (box-plots) per laboratory.

Lab number	97505	97507	97508	97509	97510	97516	97540
Method	IDEXX - IBR gB X3 Ab						
OD (REP1)	0,062	0,026	0,055	0,085	0,016	0,15	0,080
OD (REP2)	0,056	0,037	0,051	0,083	0,024	0,10	0,090
Mean	0,059	0,032	0,053	0,084	0,020	0,12	0,085
SD	0,0042	0,0078	0,0028	0,0014	0,0057	0,030	0,0071
CV (%)	7,19	24,69	5,34	1,68	28,28	23,95	8,32

Numbers were rounded to 2 significant decimal place. (OD = optical density; REP = repetition; SD = standard deviation; CV = coefficient of variation).

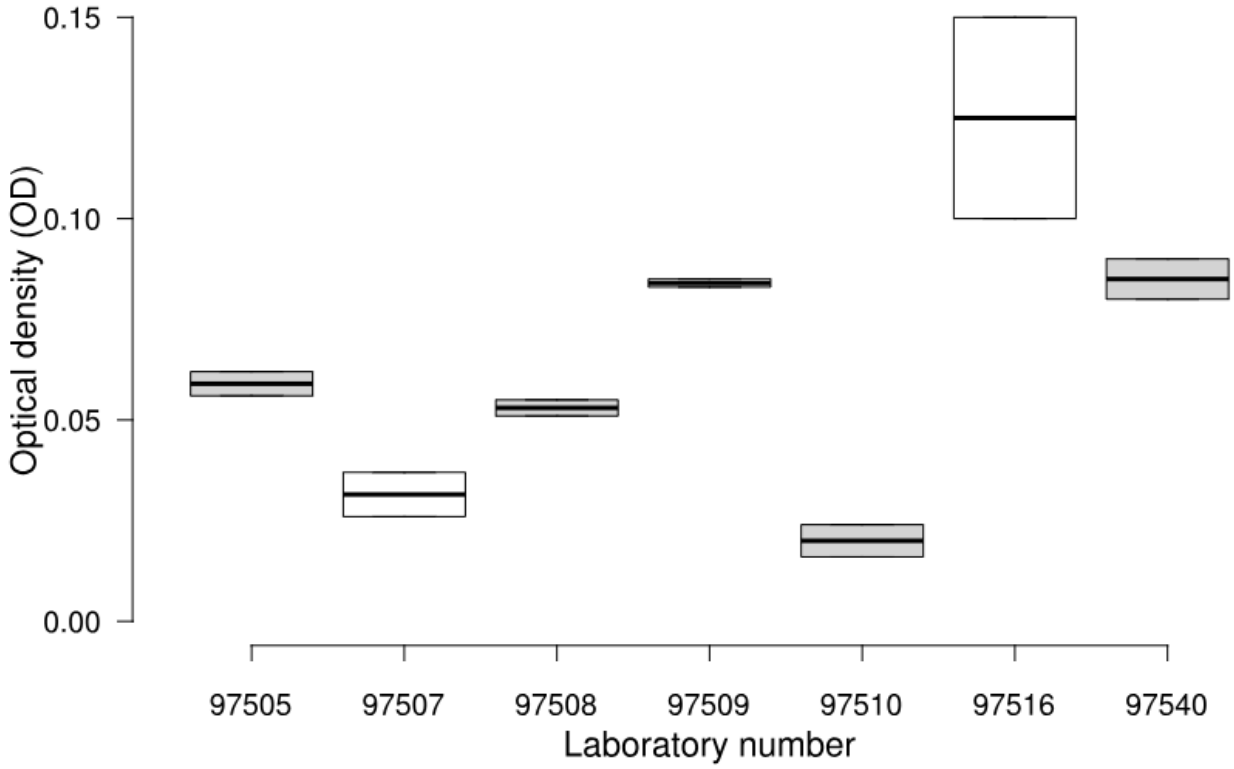


Figure 2. Distribution of the optical densities (box-plots) per laboratory.

Lab number	97505	97507	97508	97509	97510	97516	97540
Method	IDEXX - IBR gB X3 Ab						
OD (REP1)	0,56	0,65	0,39	0,32	0,39	0,57	0,50
OD (REP2)	0,54	0,55	0,43	0,32	0,38	0,54	0,49
Mean	0,55	0,60	0,41	0,32	0,38	0,55	0,49
SD	0,018	0,073	0,023	0,00071	0,011	0,018	0,0035
CV (%)	3,21	12,19	5,71	0,22	2,77	3,19	0,72

Numbers were rounded to 2 significant decimal place. (OD = optical density; REP = repetition; SD = standard deviation; CV = coefficient of variation).

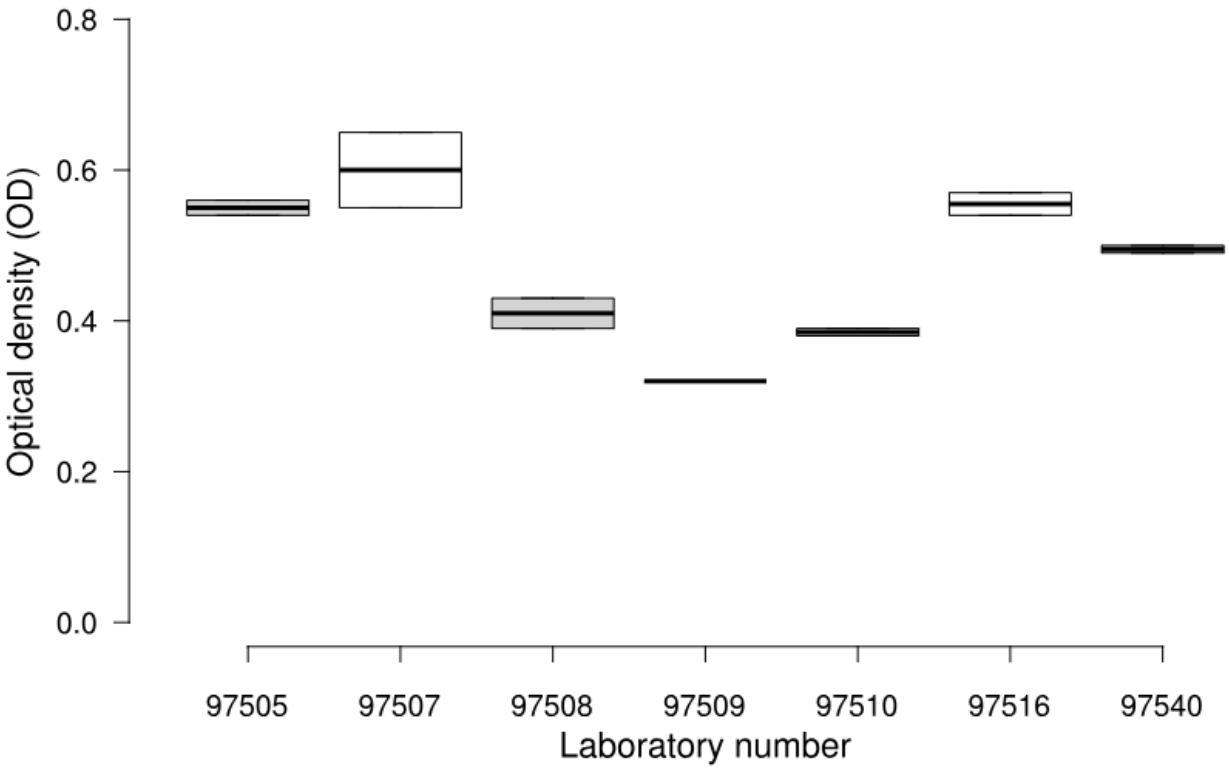


Figure 3. Distribution of the optical densities (box-plots) per laboratory.

6.1.2 SEROLOGY (SERUM GE)

PT2023IBRgESERPS1

Lab number	97505	97507 (1)	97507 (2)	97508 (1)	97508 (2)	97509
Method	M_1	M_1	M_3	M_1	M_3	M_2
OD (REP1)	0,18	0,26	0,62	0,19	0,78	0,17
OD (REP2)	0,17	0,25	0,64	0,21	0,80	0,16
Mean	0,17	0,26	0,63	0,20	0,79	0,16
SD	0,0042	0,0078	0,0085	0,021	0,016	0,0049
CV (%)	2,45	3,01	1,35	10,28	2,07	3,05

Lab number	97513	97516	97522	97540 (1)	97540 (2)	97548
Method	M_1	M_2	M_3	M_3	M_1	M_3
OD (REP1)	0,23	0,26	0,19	0,61	0,32	0,27
OD (REP2)	0,35	0,28	0,19	0,70	0,28	0,25
Mean	0,29	0,27	0,19	0,66	0,30	0,26
SD	0,079	0,018	0,0028	0,064	0,028	0,012
CV (%)	27,11	6,54	1,49	9,72	9,22	4,60

Numbers were rounded to 2 significant decimal place. (OD = optical density; REP = repetition; SD = standard deviation; CV = coefficient of variation; M_1 = IDEXX - gE blocking ELISA; M_2 = IDEXX - Bovine Rhinotracheitis Virus (BHV-1) gE Antibody Test Kit; M_3 = ID.VET - ID SCREEN® IBR gE).

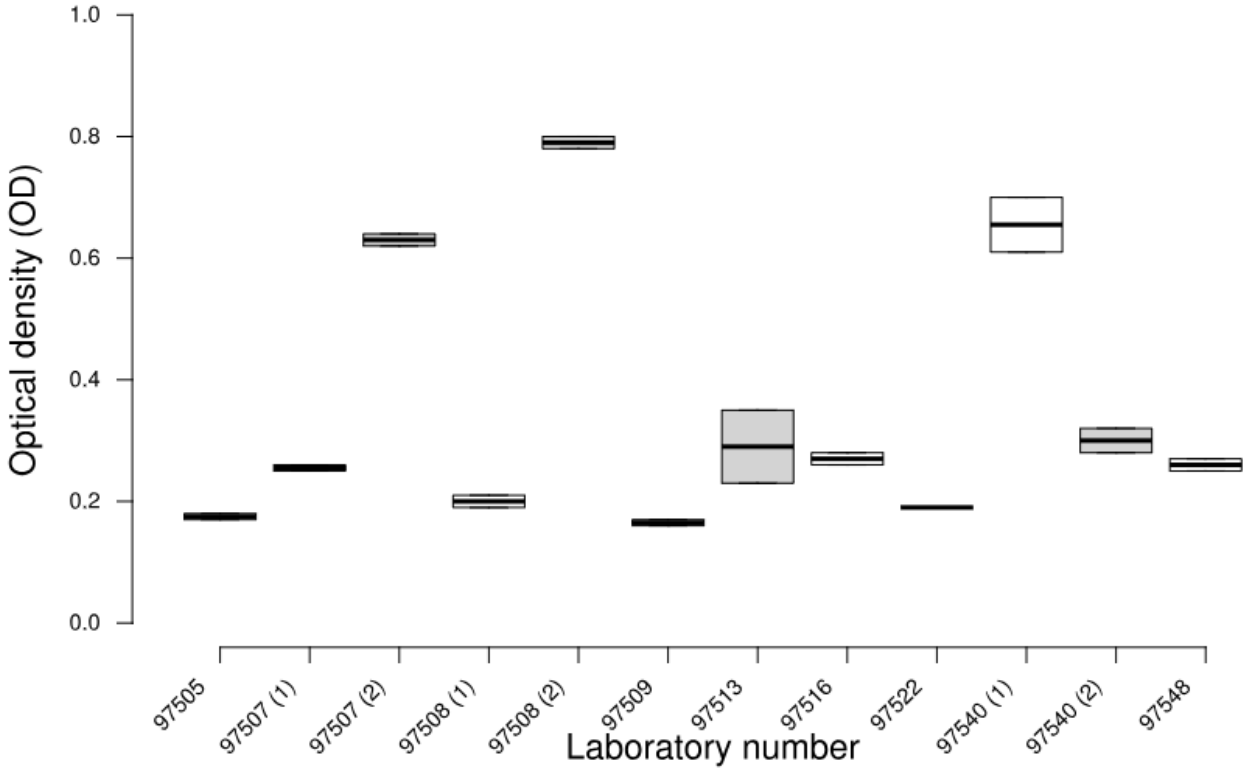


Figure 4. Distribution of the optical densities (box-plots) per laboratory.

Lab number	97505	97507 (1)	97507 (2)	97508 (1)	97508 (2)	97509
Method	M_1	M_1	M_3	M_1	M_3	M_2
OD (REP1)	0,063	0,089	0,17	0,073	0,13	0,056
OD (REP2)	0,061	0,099	0,18	0,065	0,14	0,054
Mean	0,062	0,094	0,18	0,069	0,13	0,055
SD	0,0014	0,0071	0,011	0,0057	0,0092	0,0014
CV (%)	2,28	7,52	6,43	8,20	6,83	2,57

Lab number	97513	97516	97522	97540 (1)	97540 (2)	97548
Method	M_1	M_2	M_1	M_3	M_1	M_3
OD (REP1)	0,08	0,14	0,068	0,10	0,16	0,086
OD (REP2)	0,071	0,09	0,066	0,10	0,15	0,066
Mean	0,073	0,12	0,067	0,1	0,15	0,076
SD	0,0028	0,034	0,0014	0,00	0,0066	0,014
CV (%)	3,87	29,26	2,11	0,00	4,29	18,61

Numbers were rounded to 2 significant decimal place. (OD = optical density; REP = repetition; SD = standard deviation; CV = coefficient of variation; M_1 = IDEXX - gE blocking ELISA; M_2 = IDEXX - Bovine Rhinotracheitis Virus (BHV-1) gE Antibody Test Kit; M_3 = ID.VET - ID SCREEN® IBR gE).

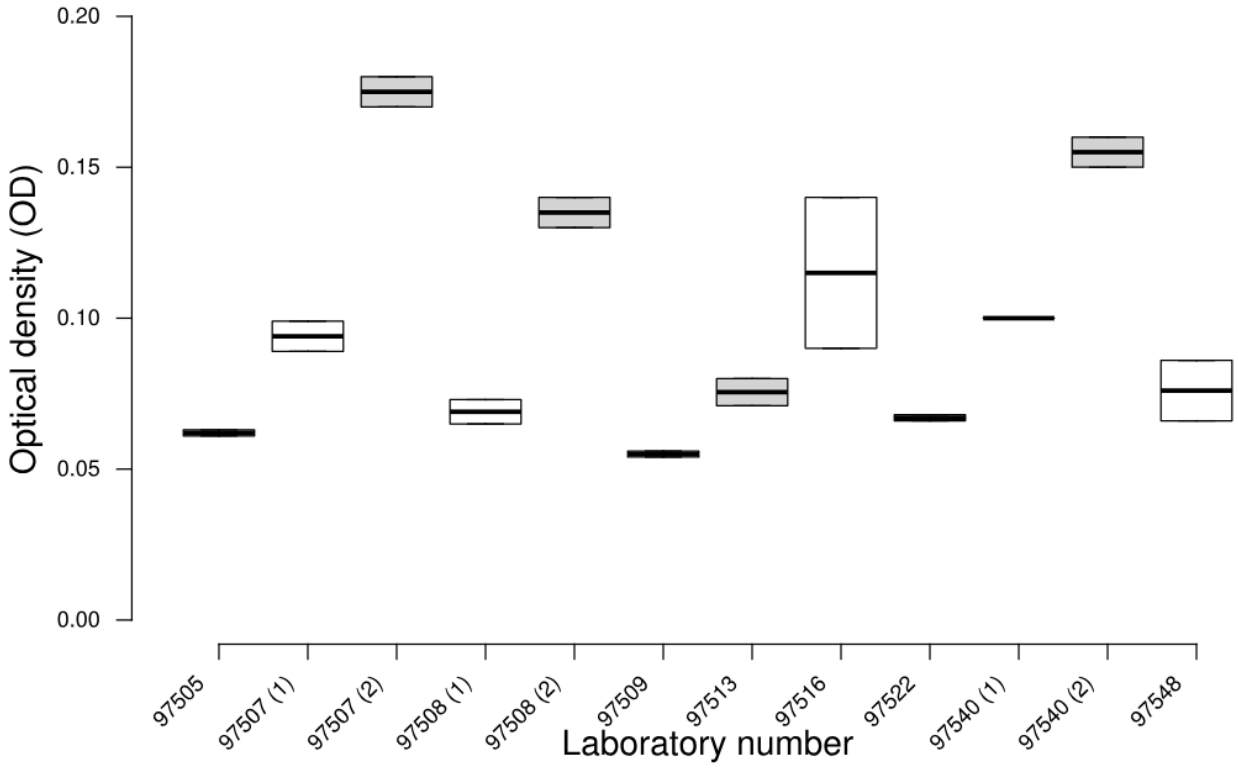


Figure 5. Distribution of the optical densities (box-plots) per laboratory.

6.1.3 SEROLOGY (MILK GB)

PT2023IBRgBSERPM3

Lab number	97505	97509	97511	97512
Method	M_1	M_2	M_2	M_2
OD (REP1)	6,00	0,063	0,065	0,11
OD (REP2)	4,98	0,060	0,070	0,089
Mean	5,49	0,062	0,068	0,10
SD	0,72	0,0020	0,0035	0,015
CV (%)	13,10	3,45	5,24	14,92

Numbers were rounded to 2 significant decimal place. (OD = optical density; REP = repetition; SD = standard deviation; CV = coefficient of variation; M_1 = ID.VET - ID SCREEN® IBR MILK gB INDIRECT; M_2 = Indical (Qiagen) - Cattletype BHV1 gB Ab milk.

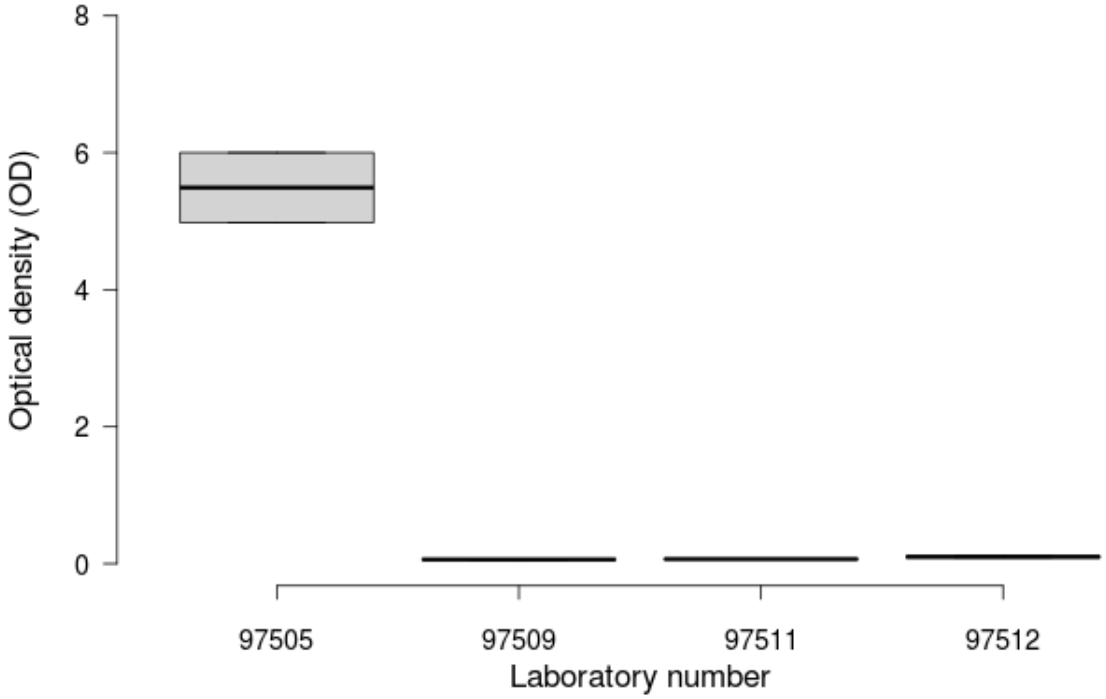


Figure 6. Distribution of the optical densities (box-plots) per laboratory.

6.2 Annex 2: Additional information

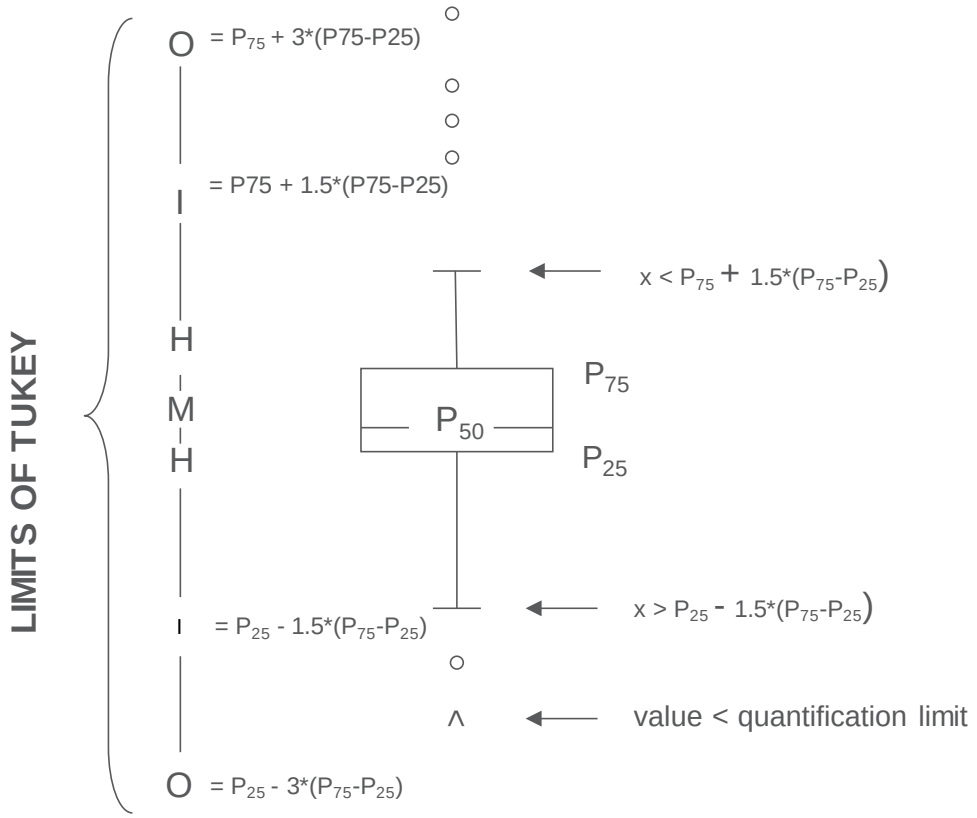
The **calendar** for Proficiency Testing in Veterinary diagnosis is available on our website:

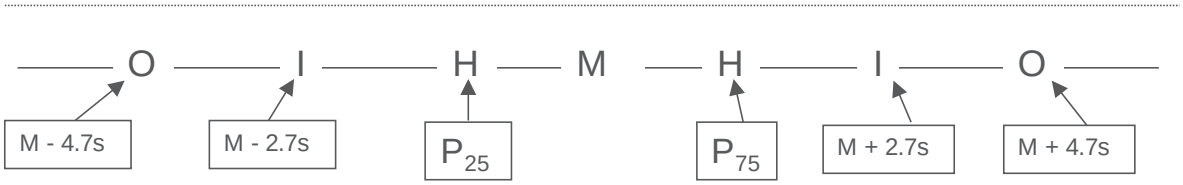
- NL: https://www.sciensano.be/fr/biblio/eke-kalender-2023
- FR: https://www.sciensano.be/en/biblio/calendrier-eeq-2023
- EN: https://www.sciensano.be/en/biblio/eqa-calendar-2023

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 3 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