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081-PT

PROFICIENCY TESTING 2019

SCRAPIE (SCR)

Genotype identification for the detection

of genetically linked susceptibility to scrapie in blood

SCIENTIFIC DIRECTORATE INFECTIOUS DISEASES IN ANIMALS

SCIENSANO

DATE BEGIN PT: 20 MAY 2019

DATE REPORT: 31 JULY 2019

I. Introduction

Details relevant to the proficiency test (PT) are available in the procedure SOP 25/01 'Beheer van de proficiency testen georganiseerd door de Wetenschappelijke Directie Infectieziekten Dier/Gestion des essais d'aptitude organisés par la Direction Scientifique Maladies Infectieuses Animales', which is summarized in the 'Manual for the participant'.

II. Aim

The aim of this PT was to evaluate the ability of the participating laboratories to identify genotypes related to genetically linked susceptibility to scrapie in blood of sheep origin.

III. Materials and methods

III.1. Conduct of diagnostic tests

In the framework of this PT, predefined reference blood samples must be tested by means of real-time PCR (RT-PCR) and/or sequencing. The procedures for the RT-PCR and/or sequencing must be fully described in the SOPs of the participating laboratories.

III.2. Reference samples

Ten reference blood samples of sheep origin, coded 'PT2019SCRGENB1', 'PT2019SCRGENB2', 'PT2019SCRGENB3', 'PT2019SCRGENB4', 'PT2019SCRGENB5', 'PT2019SCRGENB6', 'PT2019SCRGENB7', 'PT2019SCRGENB8', 'PT2019SCRGENB9' and 'PT2019SCRGENB10', were used. In total, 20 aliquots were distributed to 2 participating laboratories. All participants received 1 aliquot of each reference blood sample. The positions of the reference blood samples in the sent blocks were randomized for each participant (Table 3).

For each reference blood sample, a certificate containing the assigned status (= 'golden standard') was made. The genotype of the reference blood samples was assigned based on the results obtained during pre-verification tests, namely RT-PCR and Denaturing Gradient Gel Electrophoresis (DGGE). Hereby, the same genotype was obtained with both methods for each reference blood sample. Consequently, these reference blood samples were considered as reliable samples to use for the purpose of this PT. In addition, the reference blood samples were also tested once after the PT in order to confirm their stability and status (post-verification), using RT-PCR and DGGE.

III.3. Classification of results, level of agreement and threshold for qualification

III.3.1. Classification of results

Results provided by the participating laboratories are categorized as *success* when the reported result matches with the assigned status (i.e., if the genotype is correctly identified) or *failure* when the reported result does not match with the assigned status (i.e., if the genotype is not correctly identified).

III.3.2. Level of agreement

The level of agreement achieved by a participating laboratory is expressed as the percentage *success* for the 10 reference samples used in this PT.

III.3.3. Threshold for qualification

Following the procedure, a participating laboratory is only qualified if the level of agreement for the 10 reference samples is at least 90%.

IV. Results

For confidentiality reasons, the participating laboratories are quoted anonymously and the concordance table is safely kept at the Scientific Directorate Infectious Diseases in Animals of Sciensano.

IV.1. Transfer and start of the analyses of the reference samples

The 10 reference blood samples were sent frozen (dry ice) to each of the 2 participating laboratories by national courier on 20th of May 2019. All laboratories acknowledged receipt of the samples on the same day. Analyses were performed between 22th of May and 5th of June 2019 (Table 1).

IV.2. Dates at which results were returned to the Scientific Directorate Infectious Diseases in Animals of Sciensano

Results were submited to the Scientific Directorate Infectious Diseases in Animals of Sciensano on the 6th and 7th of June 2019 (Table 1).

Table 1. Overview of the dates on which (i) the reference samples were received and analyzed by the participating laboratories, and (ii) the obtained results were submitted to the Scientific Directorate Infectious Diseases in Animals of Sciensano

Laboratory	Reference samples received	Start of analysis	Submission of the results (Excel file)
LAB1	20/05/2019	**RT PCR** : 04/06/2019	07/06/2019
LAB2	20/05/2019	**RT PCR** : 22/05/2019 **PCR RFLP DGGE** : 04/06 & 05/06/2019	06/06/2019

IV.3. Compliance with the procedure

All participating laboratories have provided a duly dated and signed copy of the results.

IV.4. Qualitative data analysis

IV.4.1. Level of agreement

All participating laboratories provided qualitative results that were in full agreement with the assigned status of the reference blood samples and hence obtained 100% of agreement (Table 2).

Table 2. Agreement between the results obtained by the participating laboratories (LABNR) and the status of the blood samples assigned by the TSE reference laboratory of the Scientific Directorate Infectious Diseases in Animals of Sciensano. All participating laboratories received 10 aliquots of blood samples. Results are presented as absolute values and percentages (in parentheses).

	LABNR	
	1	**2**
failure	0 (0)	0 (0)
success	10 (100)	10 (100)

IV.4.2. Variability among participating laboratories

Since all participating laboratories reached 100% of agreement for the identification of genotypes related to genetically linked susceptibility to scrapie in reference blood samples, no variability between qualitative laboratory results could be observed.

For each participating laboratory, the obtained results and the assigned statuses for the reference blood samples are shown in Table 3.

Table 3. The responses (RESULT) of the participating laboratories (LABNR) with the internal identification of the blood samples (SAMPLE), the external identification of the blood samples (LABPOSIT), and the status assigned by the TSE reference laboratory of the Scientific Directorate Infectious Diseases in Animals of Sciensano (STATUS).

	LABNR	LABPOSIT	SAMPLE	STATUS	RESULT	SUCCESS
1	1	1	PT2019SCRGENB4	ALRR/ALRR	ALRR/ALRR	1
2	1	2	PT2019SCRGENB7	ALRR/ALRQ	ALRR/ALRQ	1
3	1	3	PT2019SCRGENB2	ALRQ/ALRQ	ALRQ/ALRQ	1
4	1	4	PT2019SCRGENB8	ALRR/VLRQ	ALRR/VLRQ	1
5	1	5	PT2019SCRGENB1	ALRR/ALHQ	ALRR/ALHQ	1
6	1	6	PT2019SCRGENB5	ALRR/ALRH	ALRR/ALRH	1
7	1	7	PT2019SCRGENB9	ALRQ/ALRH	ALRQ/ALRH	1
8	1	8	PT2019SCRGENB10	ALRR/ALRH	ALRR/ALRH	1
9	1	9	PT2019SCRGENB3	ALRQ/ALHQ	ALRQ/ALHQ	1
10	1	10	PT2019SCRGENB6	ALRR/ALRQ	ALRR/ALRQ	1
11	2	1	PT2019SCRGENB2	ALRQ/ALRQ	ALRQ/ALRQ	1
12	2	2	PT2019SCRGENB8	ALRR/VLRQ	ALRR/VLRQ	1
13	2	3	PT2019SCRGENB1	ALRR/ALHQ	ALRR/ALHQ	1
14	2	4	PT2019SCRGENB6	ALRR/ALRQ	ALRR/ALRQ	1
15	2	5	PT2019SCRGENB7	ALRR/ALRQ	ALRR/ALRQ	1
16	2	6	PT2019SCRGENB9	ALRQ/ALRH	ALRQ/ALRH	1
17	2	7	PT2019SCRGENB3	ALRQ/ALHQ	ALRQ/ALHQ	1
18	2	8	PT2019SCRGENB5	ALRR/ALRH	ALRR/ALRH	1
19	2	9	PT2019SCRGENB10	ALRR/ALRH	ALRR/ALRH	1
20	2	10	PT2019SCRGENB4	ALRR/ALRR	ALRR/ALRR	1

V. Discussion

The purpose of this PT was to assess the performance of the participating laboratories when analyzing reference blood samples of sheep origin by RT-PCR and/or sequencing in order to identify genotypes related to genetically linked susceptibility to scrapie.

All participating laboratories provided qualitative results that were in full agreement with the assigned status of the reference blood samples (100% of agreement). All participating laboratories performed RT-PCR in order to identify the genotypes.

VI. Conclusions

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 blood samples assigned by the TSE reference laboratory of the Scientific Directorate Infectious Diseases in Animals of Sciensano (see III.3.3.). Consequently, all participants achieved a satisfactory performance for the identification of genotypes related to genetically linked susceptibility to scrapie in reference blood samples.

Coordinator proficiency tests

Katia Knapen and Bernard China

Appendix

Name of the participating laboratories

Association Régionale de Santé et d'Identification Animales (ARSIA) (Ciney, Belgium)

Sciensano (Ukkel, Belgium)