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Proficiency test for corticosteroids in bovine and porcine urine

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Introduction

A proficiency test for corticosteroids in bovine and porcine urine was organized by the European Union Reference Laboratory (EURL) for hormonal growth promoting compounds, sedatives and mycotoxins. This EURL function is carried out by Wageningen Food Safety Research (WFSR), part of Wageningen University & Research. Twenty-five European participants (of which 22 National Reference Laboratories within Europe) received three bovine (ABC) and two porcine urine (DE) samples. The following analytes were present ranging from 0.7-5 µg/l:

Material A: triamcinolone acetonide (TCA)
Material B: dexamethasone (DEX) and triamcinolone acetonide
Material C: betamethasone (BET) and dexamethasone
Material D: clobetasol (CLO)
Material E: dexamethasone and triamcinolone acetonide

The Common EURL protocol for proficiency testing in the field of veterinary drugs [1] was used to evaluate the participants' results. In this protocol a scoring system for the evaluation of the participants is used. In short, points are assigned for a z-score <2 (1.5 point), z-score >2 (1 point) and one or two false positive results (-1 point).

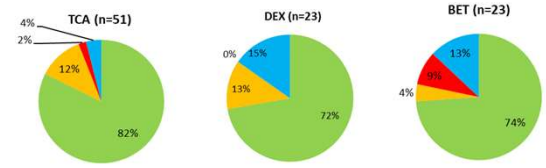
Results

Twenty-four participants reported results. Seventeen labs included BET, DEX and TCA in their method and seven labs included only DEX in their method. CLO was not taken into account since only two participants reported quantitative results. The results are presented in the Table 1 and Figure 1.

Table 1: Results of corticosteroids in materials A-E

Material	Analyte	# results	# quantitative	FN results	Consensus value µg/l	#correct results
A	TCA	17	15	1	2.4	12
B	DEX	24	20		1.2	17
	TCA	17	16	1	5.2	15
C	BET	23	18	2	1.5	17
	DEX	24	20		1.2	17
D	CLO	2	2		-	-
E	DEX	24	21		1.3	18
	TCA	18	17		5.6	15

In addition, two false positive results were reported for the presence of isoflupredone in materials D and E.



Green	|z-score| <2
Orange	|z-score| >2
Red	False negative result
Blue	Qualitative result

Figure 1: Overview of |z|-scores <2 and >2, false negative results and qualitative results

The correct quantitative results vary from 72% for DEX to 82% for TCA. Recently the Minimum Method Performance Requirement (MMPR) [10] for DEX was lowered from 2 µg/l to 0.5 µg/l. Taken into account the consensus values of DEX in this PT, ranging from 1.2 to 1.3 µg/l, quite some labs should improve the quantification at a lower level, since at a level of more than two times higher than the MMPR only 72% correct quantitative results were reported.

In total 16 questionable/unsatisfactory z-scores, 4 false negative and 2 false positive results were reported.

Conclusions

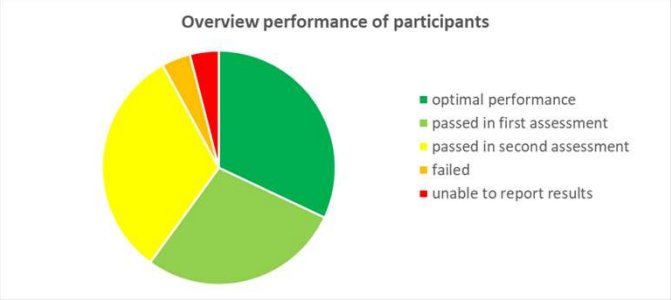


Figure 2. Overview of performance of participants according to EURL point score system [1]

In this test:

- eight NRLs passed the PT by achieving a maximum score by correct quantification of all compounds, the absence of false positive (FP) and false negative (FN) results and reporting in time;
- seven labs (five NRLs) passed the PT in the first assessment by scoring more than 65% and less than 100% of achievable points;
- another eight (seven NRLs) passed the PT in the second assessment by scoring more than 65% of achievable points taking into account the participant's scope;
- One NRL failed the test and one NRL was unable to report results.
- Overall, 60% of the participants passed the test in the first round and 32% in the second round.

References

[1] Common EURL Protocol for Proficiency Testing in the Field of Veterinary Drug Residues, 30 April 2020.

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