Facing analytical quality.

proof acs

Ring test
Polar pesticides and contaminants in black tea
P2414-RT

Summary

The entire report is available to participants only.

The ring test was designed, realised, evaluated, and authorised on behalf of PROOF-ACS GmbH by

Dr. Birgit Schindler
Managing Director PROOF-ACS GmbH
Project coordinator

The report was approved by

Dr. Birgit Schindler
cn=Dr. Birgit Schindler,
o=PROOF-ACS GmbH,
ou=Managing Director,
email=proof@proof-acs.de, c=DE
2024.04.22 10:22:59 +02'00'

Dr. Birgit Schindler

Participants with any comments or concerns related to this ring test are invited to contact:

PROOF-ACS GmbH
Gottlieb-Daimler-Str. 1
28237 Bremen
Phone: +49 421 388 928 50
E-mail: proof@proof-acs.de
www.proof-acs.de

DAkkS
Deutsche
Akkreditierungsstelle
D-EP-22211-01-00

PROOF-ACS is a DAkkS accredited proficiency testing provider according to DIN EN ISO 17043:2010 (D-EP-22211-01-00). This ring test is covered by the scope of accreditation.

PROOF-ACS GmbH does not have any analytical laboratory facilities of its own. Homogeneity testing and stability testing are subcontracted to laboratories, accredited according to DIN EN ISO 17025. The subcontracted laboratory may also participate in the ring tests. If so, the laboratory is treated in the same way as other participants and the same rules of confidentiality apply.

The proficiency test evaluates the performances of laboratories with respect to their ability to quantify polar pesticides and contaminants in black tea. 11 laboratories across three European countries (Germany, France, and Italy) took part in the proficiency test.

The test material is prepared of organic black tea. The raw material is milled in a Retsch ultra-centrifugal mill ZM200. The resulting powder is homogenised intensively and tested for incurred residues thereafter. The raw material contains incurred residues of nicotine. Nicotine is considered for evaluation without further spiking.

The milled and homogenised raw material was provided to all participants as blank material. To prepare the test material, the raw material was spiked with anthraquinone, biphenyl, chlorate, perchlorate, glyphosate, AMPA, diquat, paraquat, matrine, and oxymatrine. It was up to the laboratories to quantify the full set of 11 parameters or a selection of it. The laboratories were asked to analyse both materials, the test material, and the blank material and to mark parameters, which they did not analyse as “n.a.” (not analysed).

All labs kept the term of submission of results and are considered for evaluation.

The report contains an assessment related to

- the *trueness* of the results. The trueness is expressed as the coverage of the spiked level in %. The coverage should be at least between 70 and 120 % of the spiked level. The trueness criterion is applied to all parameters except nicotine (incurred residue).
- the *comparability* of the results. The evaluation of the comparability is based on the z-score model. The z-score should be at least ≤ |2|. The comparability criterion is applied to anthraquinone, chlorate, perchlorate, and nicotine. The comparability criterion is not applicable to all other parameters due to the limited number of reported results.

Results

Parameter	Spiked level [mg/kg]	Assigned value [mg/kg]	Assigned value in % of the spiked level	No. of results	No. of results with a z-score ≤ |2|	No. of results within 70-120 % of the spiked level
Anthraquinone	0.037	0.0452	122*	7	6	6
Biphenyl	0.069	-	-	7	not applicable	5
Chlorate	0.055	0.0565	103	8	8	7
Perchlorate	0.23	0.217	95	8	8	8
Nicotine	incurred	0.146	-	9	8	not applicable
Glyphosate	0.19	-	-	5	not applicable	5
AMPA	0.057	-	-	4	not applicable	3
Diquat	0.062	-	-	3	not applicable	2
Paraquat	0.093	-	-	3	not applicable	3
Matrine	0.12	-	-	6	not applicable	6
Oxymatrine	0.088	-	-	5	not applicable	4

* The blank material contains incurred residues of anthraquinone (about 0.008 mg/kg), which are considered for evaluation.

To summarise:

- 11 laboratories took part in the tests. The laboratories were free to choose if they report results related to all 11 parameters or a selection of it. One lab reported results related to all 11 parameters.
- Most of the labs reported results related to the basic module (anthraquinone, biphenyl, chlorate, perchlorate, and nicotine). A reduced number of labs ordered the module glyphosate and AMPA (6 labs), diquat and paraquat (5 labs), and matrine and oxymatrine (6 labs).
- Nicotine is an incurred residue, while all other parameters are spiked to the material.
- Comparability:

  Anthraquinone, biphenyl, chlorate, perchlorate, and nicotine are evaluated with respect to the comparability criterion.
- Trueness:

  All parameters except nicotine are evaluated with respect to the trueness criterion.
- The overall performance of the labs is good, even though the quantification of polar pesticides is challenging in complex matrices like black tea.