



International Cooperative Programme on Assessment and Monitoring of Air Pollution Effects on Forests

Technical Report QA-RFoliar26

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Michael Tatzber



Austrian Research Centre for Forests
Forest Foliar Co-ordinating Centre
Seckendorff-Gudent-Weg 8
A-1131 Vienna/Austria

TABLE OF CONTENTS

1 INTRODUCTION	1
2 TASK, MATERIAL, PARTICIPANTS, EVALUATION	2
2.1 Task	2
2.2 Material	3
2.3 Participants	4
2.4 ICP-Forests Laboratories and requalification	6
2.5 Data Evaluation	6
3 RESULTS	10
3.1 Main results of the questionnaire	10
3.2 Results of the 28 th Interlaboratory Comparison Test	11
3.3 Comparison of the 28 th Interlaboratory Test with former tests	15
3.4 Evaluation by element	19
3.4.1 Nitrogen	19
3.4.2 Sulphur	19
3.4.3 Phosphorus	19
3.4.4 Calcium	19
3.4.5 Magnesium	19
3.4.6 Potassium	19
3.4.7 Carbon	19
3.4.8 Zinc	20
3.4.9 Manganese	20
3.4.10 Iron	20
3.4.11 Copper	20
3.4.12 Lead	20
3.4.13 Cadmium	20
3.4.14 Boron	21
3.4.15 Arsenic	21
3.4.16 Chromium	21
3.4.17 Cobalt	21
3.4.18 Mercury	21
3.4.19 Nickel	21
4 CONCLUSIONS	22
5 LITERATURE	24
List of participating laboratories	27
Method Code - Pretreatment	33
Method Code - Determination	34
List of abbreviations	35
ANNEX - Results	37

1 INTRODUCTION

A high quality and comparable laboratory standard in all countries is indispensable for a European-wide survey of the state of forests. Small changes in nature should be detected in a reliable way and not the changes in laboratory quality. Important issues on this way are method harmonisations, QA/QC in the laboratory daily routines and the implementation of a regularly performed Interlaboratory Comparison Tests programme.

This Needle/Leaf Interlaboratory Comparison Test programme started with the first European Foliar-Interlaboratory Comparison Test on two certified standards (BCR 100-*beech leaves* and BCR 101 - *spruce needles*) in 1993. The data were submitted by post or fax and had to be rechecked from the laboratories. The entire data collection and analysis had to be carried out manually. The final report was not available for several months. The Interlaboratory Comparison Tests were carried out every two years until 2002.

Starting in 2003/2004 (6th Interlaboratory Comparison Test), an annual test program was set up and the tests were carried out by the Forest Foliar Co-ordinating Centre/Austria (FFCC). The data collection was done via the internet. The Needle/Leaf Interlaboratory Comparison Test program was opened for every interested laboratory.

From 2012, an internet-based web interface was used for data collection, to collect the billing information for the participation fee, for the data evaluation and for the creation of online qualification reports. The interface offers the option of initial data checks (decimal errors, non plausible results, max LOQ) immediately before the final evaluation. The results of the latest interlaboratory comparison are currently available within a few days, so that laboratories can react comparatively quickly in the event of unsatisfactory results. For this case a re-qualification procedure was set up, starting with the 11th Test in 2009 (see: <https://bfw.ac.at/rz/bfwcms2.web?dok=7830>). This feedback procedure is mandatory for all *ICP-Forests laboratories* and showed very a positive effect on the data quality.

To support the participating laboratories and to exchange knowledge between them, meetings of the heads of the laboratories at regular intervals are organized from the ICP-Forests Working Group on quality assurance and quality control in laboratories. Leaf and needle reference materials for method validation and method verification are offered by FFCC (see: <https://bfw.ac.at/rz/bfwcms2.web?dok=5146>).

Today this interlaboratory test program is open for every laboratory and it is financed by participation fee, by advertising, by selling reference materials, by ringtest sample collection and/or sample preparation from participating laboratories. An overview is given on the ICP-Forests webpage, by following link:

<https://icp-forests.net/group/qualityinlaboratories/page/foilage-and-litterfall-ringtest-and-ga-qc-information>

2 TASK, MATERIAL, PARTICIPANTS AND EVALUATION

2.1 Task and definition of ICP-Forests laboratories

The Forest Foliar Co-ordinating Centre established the following timetable:

- Information of the participating labs (February 2025)
- Registration of the participants via internet (30th June 2025)
- Submission of the ring test samples (July 2025)
- Submission of the results from the labs (October-December 2025)
- Deadline of data input (1st January 2026)
- Evaluation according to DIN 38402-42:2005-09 (January 2026)
- Submission of the final report and the online qualification reports (February 2026)
- Re-qualification process finished (1st September 2026)

The mandatory parameters C, Ca, K, Mg, N, P and S had to be analysed from all ICP-Forests laboratories, optional parameters were As, B, Cd, Co, Cr, Cu, Fe, Hg, Mn, Ni, Pb and Zn (see also chapter 2.5).

Results from a lot of other elements could be submitted, too. All mandatory, optional, additional and possible elements are shown in Figure 1.

Figure 1: Possible elements

Ia	Ila	IIlb	IVb	Vb	Vlb	VIIb	VIIIb			Ib	IIb	IIIa	IVa	Va	Vla	VIIa	VIIla
1 H																	2 He
3 Li	4 Be										5 B	6 C	7 N	8 O	9 F	10 Ne	
11 Na	12 Mg										13 Al	14 Si	15 P	16 S	17 Cl	18 Ar	
19 K	20 Ca	21 Sc	22 Ti	23 V	24 Cr	25 Mn	26 Fe	27 Co	28 Ni	29 Cu	30 Zn	31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr
37 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cd	49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe
55 Cs	56 Ba	71 Lu	72 Hf	73 Ta	74 W	75 Re	76 Os	77 Ir	78 Pt	79 Au	80 Hg	81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn
87 Fr	88 Ra	103 Lr	104 Rf	105 Db	106 Sg	107 Bh	108 Hs	109 Mt	110 Ds	111 Rg	112 Cn	113 Nh	114 Fl	115 Mc	116 Lv	117 Ts	118 Og

57 La	58 Ce	59 Pr	60 Nd	61 Pm	62 Sm	63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69 Tm	70 Yb
89 Ac	90 Th	91 Pa	92 U	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No

Mandatory (for ICP-Forests labs)	Optional (for ICP-Forests labs)	Additional (special interest for more labs)	Possible
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For each parameter the submission of four replicates per sample is necessary. The minimum sample weight (especially for mandatory and optional elements) should be 250 mg per replicate, in order to ensure the homogeneity of the sample material. All results must be calculated on a dry weight basis (105°C).

In case that an extra milling step is needed for C, N or S determinations using a micro elemental-analyzer for solids (sample weight < 100mg), milling a subsample of the total sample is recommended to avoid possible contamination (Cr, Ni, Fe).

The used pre-treatment method and the determination method must be specified by a code. This code was harmonized for all ringtests (foliage & litterfall, deposition & soil solution and soil) after the 4th Meeting of the Heads of the Laboratories in Zadar 2013.

For a more detailed evaluation all participating laboratories had to answer a questionnaire to obtain more information about the status of their quality control systems, their instrumentation, their sample numbers/year and about their methodological knowledge. *ICP-Forests laboratories* had to mark all parameters, if they plan to analyse and submit monitoring results to ICP-FORESTS PCC from the growing season 2025.

2.2 Material

In July 2025, the Austrian Research Centre for Forests (BFW) sent out four dried and powdered plant samples to 43 laboratories in 23 countries.

These samples consisted of:

1. Spruce needles (Austria) – same sample as for the 24th test (sample 4 there)
2. Atlas Cedar needles (Austria)
3. Spruce needles (Austria)
4. Litterfall-leaves (Austria)

Sample 1 was collected in Austria/Carinthia (special thanks to DI Walter Wuggenigg and Hubert Kügler/LFD Kärnten, DI Dr. Hubert Untersteiner/TIAG Treibach and Ing. Manfred Jamnig/FAST Strassburg/BFI St. Veit). **Sample 2** was collected and prepared in Austria (from employees of BFW). **Sample 3** was collected in Austria – (Carinthia, Treibach/Meiselding; special thanks to Hubert Kügler and DI Paul Schellander/LFD Kärnten). **Sample 4** was collected and prepared in Austria (from employees of BFW).

Special thanks to all colleagues who collected and prepared samples for this interlaboratory comparison! The further sample preparation (drying and grinding) - if necessary - was done in the BFW laboratory for air pollution monitoring and plant analyses. Before the samples were sent out they were once more homogenized and filled in PE-bags. Homogeneity was tested for these samples by analysing their B, Ca, Cr, Cu, Fe, K, Hg, Mg, Mn, N, Ni, S and Zn contents in eight randomly selected sub samples. No significant variation (Kruskal-Wallis Test - 95% significance level) could be found between the results of eight sub samples, and they were therefore considered to be homogeneous.

2.3 Participants

Table 1 shows the number of countries and laboratories taking part in the interlaboratory comparison test program.

Table 1: Numbers of countries and laboratories since the first interlaboratory comparison test

Interlaboratory Comparison Test	Year	Number of countries	Number of laboratories
1 st	1993/94	21	24
2 nd	1995/96	25	39
3 rd	1997/98	29	51
4 th	1999/00	29	52
5 th	2001/02	29	53
6 th	2003/04	26	46
7 th	2004/05	23	43
8 th	2005/06	30	52
9 th	2006/07	28	53
10 th	2007/08	29	54
11 th	2008/09	28	56
12 th	2009/10	30	56
13 th	2010/11	29	60
14 th	2011/12	28	62
15 th	2012/13	28	61
16 th	2013/14	25	57
17 th	2014/15	25	54
18 th	2015/16	25	53
19 th	2016/17	22	45
20 th	2017/18	23	48
21 st	2018/19	24	52
22 nd	2019/20	23	47
23 rd	2020/21	23	48
24 th	2021/22	25	47
25 th	2022/23	22	43
26 th	2023/24	22	41
27 th	2024/25	23	42
28 th	2025/26	23	43

With a few exceptions, all other laboratories analysed the complete list of mandatory elements in the 28th Needle/Leaf Interlaboratory Comparison Test (s. Table 2).

2.4 ICP-Forests Laboratories and requalification

ICP-Forests laboratories are characterised by determinations of parameters of samples from ICP-Forests monitoring plots. From the growing season 2025, these results will be sent to the ICP-Forests Programme Co-ordinating Centre (PCC) in 2026. The Needle/Leaf Interlaboratory Comparison Test's main purpose is the quality assurance of these data which are submitted to ICP-Forests. With this respect, each laboratory specifies if it participates in this test as an ICP-Forests laboratory or not for every parameter during the submission of the results (see Table 2). For these *ICP-Forests laboratories*, determinations of the parameters C, Ca, K, Mg, N, P and S are mandatory. Furthermore, optional parameters for these *ICP-Forests laboratories* are the parameters As, B, Cd, Cr, Co, Cu, Fe, Hg, Mn, Ni, Pb and Zn. These mandatory and optional parameters are evaluated according to the normative DIN 38402-42. Consequently, the list of mandatory and optional parameters does not apply to laboratories that are not ICP-Forests laboratories. If an ICP-forests laboratory fails mandatory and/or optional parameters, a requalification is obligatory. For all laboratories that are no ICP-Forests laboratories for submitted parameters, a requalification is not obligatory.

2.5 Data Evaluation

Only in the case that four replicates above the quantification limits are entered for a sample, its results can be used for calculating an outlier free laboratory mean value. Results below the quantification limit are marked with "<", followed by the quantification limit of the laboratory (e.g. <0.1, see Annex-Results).

The results of this interlaboratory comparison test were evaluated according to the normative DIN 38402-42:2005-09. This method identifies three types of outliers: With the Grubbs-test the four replicates from each laboratory are first checked for outliers between them (type 1 outliers). The second step is to compare the recalculated mean values of each lab with the mean value from all labs as well as with the Grubb-test for outliers (type 2 outliers). At this point the outlier free total mean value and the outlier free maximum and minimum mean values of all labs can be calculated. At this point, marked type 1 outliers between the outlier-free maximum and minimum mean values are no longer outliers; they are therefore no longer excluded and are included again for the further evaluation of the interlaboratory comparison test. Third, the recalculated standard deviation from the laboratories must be compared with the total standard deviation (Cochran test) to eliminate laboratories with an excessive standard deviation (outlier type 3). In case of detected type 3 outliers, a re-check for type 2 outliers must be carried out. This last step is used to finalize the calculation the outlier-free statistical values.

After calculating the outlier free mean value for each element/sample and the laboratory mean value, the recovery is calculated and compared with the tolerable limits from Tables 3 and 4. Laboratory results that are within these tolerable limits are labelled green (passed the test); outside these limits they are labelled orange (failed the test, see Annex-Results). This type of evaluation was fixed in the Foliar Expert Panel Meetings of As (1994) and Vienna (1997).

Table 3: Tolerable limits for **normal concentrations** in foliage for the mandatory and optional elements

Element	Tolerable deviation from mean in %	Adopted by the Expert Panel Foliage and Litterfall
As	80-120	15 th Meeting - Zagreb 2017
B	80-120	6 th Meeting - Bonn 1999
C	95-105	6 th Meeting - Bonn 1999
Ca	90-110	10 th Meeting - Madrid 2007
Cd	70-130	6 th Meeting - Bonn 1999
Co	75-125	15 th Meeting - Zagreb 2017
Cr	75-125	15 th Meeting - Zagreb 2017
Cu	80-120	8 th Meeting - Prague 2003
Fe	80-120	6 th Meeting - Bonn 1999
Hg	80-120	15 th Meeting - Zagreb 2017
K	90-110	10 th Meeting - Madrid 2007
Mg	90-110	10 th Meeting - Madrid 2007
Mn	85-115	8 th Meeting - Prague 2003
N	90-110	6 th Meeting - Bonn 1999
Ni	80-120	15 th Meeting - Zagreb 2017
P	90-110	10 th Meeting - Madrid 2007
Pb	70-130	6 th Meeting - Bonn 1999
S	85-115	10 th Meeting - Madrid 2007
Zn	85-115	8 th Meeting - Prague 2003

If a limit of quantification (LOQ) is entered by a laboratory instead of a measured value, it will be checked first against the maximum acceptable LOQ from Table 5. If it exceeds the maximum acceptable LOQ, the lab will fail (labelled orange) – in case that it is equal or lower it will be checked against the outlier free mean. If a submitted LOQ lies within the tolerable limits associated with the mean of all labs, the lab will pass for this sample of the according parameter (marked in green). If the submitted LOQ exceeds these tolerable limits, the lab fails for this sample (marked in orange). This evaluation approach for LOQ values was defined at the 3rd Meeting of the Heads of the Laboratories in Arcachon (2011).

At very low concentrations, interlaboratory comparison test samples are excluded from evaluation for the elements in question (see Table 5). This procedure is necessary to avoid incorrect qualification results caused by unreliable calculations. Furthermore, in practice there is rarely a need to detect these low concentrations in natural samples, as they do not provide any additional information on the nutrient status (e.g. < 1 µg Cu/g is always a deficiency) or on the pollution impact situation (e.g. < 20 ng Cd/g, < 1 µg Cu/g, < 0.2 µg Pb/g is always not polluted).

Table 4: Tolerable limits for **low concentrations** for the mandatory and optional elements (e.g. for non-foliage litterfall). The limits were fixed in Hamburg 2009 (11th Meeting of the Expert Panel Foliage and Litterfall) and in Zagreb 2017 (15th Meeting of the Expert Panel Foliage and Litterfall)

Element	Tolerable deviation from mean in %	Applied to concentrations below
As	70-130	50 ng/g
B	70-130	5 µg/g
Ca	85-115	3 mg/g
Co	65-135	0.1 µg/g
Cr	65-135	1 µg/g
Fe	70-130	20 µg/g
Hg	70-130	50 ng/g
K	85-115	1 mg/g
Mg	85-115	0.5 mg/g
Mn	80-120	20 µg/g
N	85-115	5 mg/g
Ni	70-130	1 µg/g
P	85-115	0.5 mg/g
Pb	60-140	0.5 µg/g
S	80-120	0.5 mg/g
Zn	80-120	20 µg/g

Table 5: Maximum acceptable limit of quantification (LOQ) and lowest evaluated interlaboratory sample result fixed in Arcachon 2011 (3rd Meeting of the Heads of the Laboratories) and in Pallanza 2017 (6th Meeting of the Heads of the Laboratories)

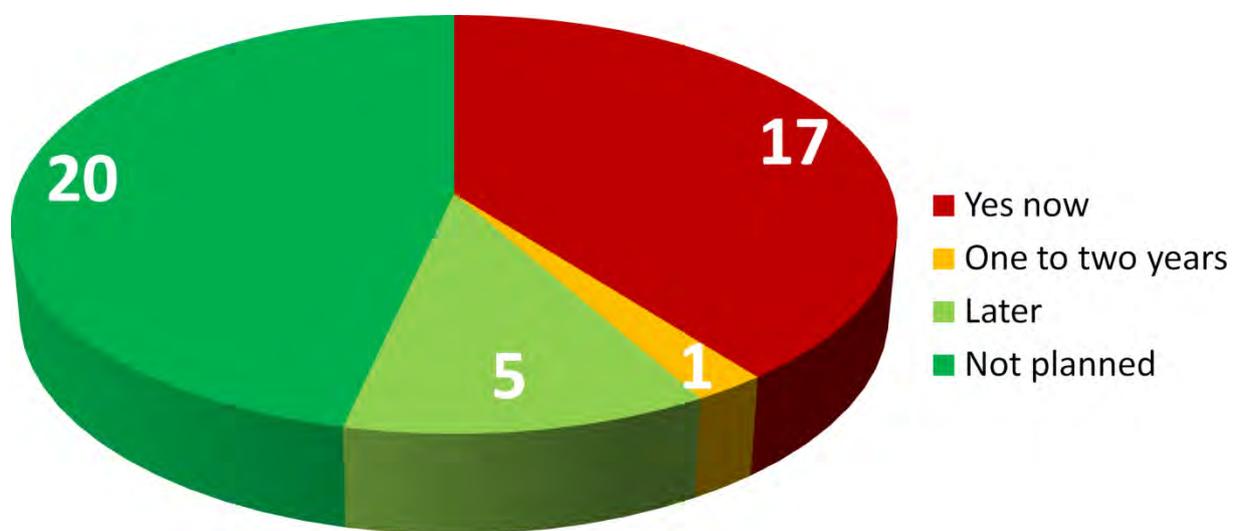
Element	Maximum acceptable limit of quantification	Lowest evaluated result
As	50 ng/g	20 ng/g
B	1 µg/g	-
C	10 g/100g	-
Ca	0.5 mg/g	-
Cd	50 ng/g	20 ng/g
Co	0.1 µg/g	0.05 µg/g
Cr	1 µg/g	0.5 µg/g
Cu	1 µg/g	1 µg/g
Fe	5 µg/g	-
Hg	20 ng/g	10 ng/g
K	0.5 mg/g	-
Mg	0.3 mg/g	-
Mn	5 µg/g	-
N	2 mg/g	-
Ni	1 µg/g	0.5 µg/g
P	0.3 mg/g	-
Pb	0.5 µg/g	0.20 µg/g
S	0.3 mg/g	-
Zn	5 µg/g	-

3 RESULTS

3.1 Main results of the questionnaire

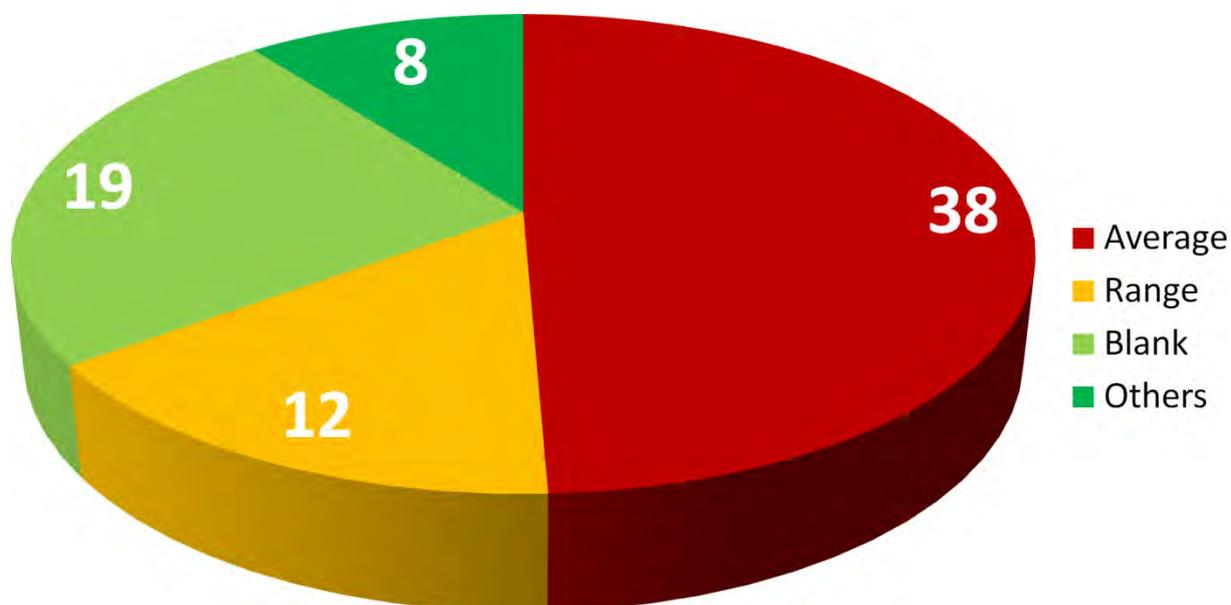
The participating laboratories answered a questionnaire in order to obtain information about the status and changes of their quality control systems and their instrumentation. The first questions dealt with the accreditation status of the participating laboratories. The summarized results are shown in Figure 2.

Figure 2: Accreditation status according EN 17025 (n=43)



41.9% of the participating laboratories are accredited now (18 labs) or plan an accreditation within 1-2 years (1 lab), 11.6% are planning their accreditation later and 46.5% (20 labs) do not plan an accreditation.

The next important question was about the usage of control charts for routine quality control (Hovind et al., 2007). 93.0% of the 43 participating laboratories have indicated that they are using control charts, and most of them are using average control charts (Figure 3). Three of the 43 laboratories state that they do not use a control chart. Some of the laboratories are using more than one type of control charts (Figure 3).

Figure 3: Types of control charts used in foliar laboratories (multiple answers were possible)

3.2 Results of the samples determined in the 28th Interlaboratory Comparison Test

Table 6 gives an overview about the test samples analysed by the different laboratories and about correct or failed results of these determinations. This evaluation is based on the tolerable limits from Table 3 and Table 4 and on the maximum acceptable limit of quantification (LOQ) from Table 5. A green marked field without any signs "<" or ">" means all samples were analysed well, a grey marked field means no results were submitted from this laboratory till 1st of January 2026. The signs "<" or ">" marked in red mean that results were below or above the tolerable limits.

As stated in the description of Table 5, LOQ's are tested against the maximum acceptable LOQ and then against the lower tolerable limit associated with the mean of all laboratories. If it does not correspond to the maximum permissible LOQ, it is labelled with an "L" (see Table 6). A further important parameter is the total percentage of correct results per lab, which is calculated from all determinations and if they were correct or not. For the following participants, the percentage of correct results is below 80%, so that QC/QA problems must also be taken into account in their laboratory:

F27 (78.95%), **S22** (78.57%), **F19** (77.05%), **F24** (71.70%), **A42** (55.00%), **A43** (50.00%), **A62** (50.00%), **A97** (39.39%) and **A91** (25.00%)

Some accepted results are within the tolerable limits, but the statistical evaluation shows an excessive standard deviation (type 1 or 3 outliers, marked with "a" or "c", respectively) or a high V_i (> 10%, marked with red colour; see the Tables for the mandatory and optional parameters in the Annex - Results section). This means these labs have higher probabilities for e.g. contamination influences or other methodological problems. It should be kept in mind that such errors have a random character and increase the probability of failed determinations in the future. Hence they should be seen as alarm signs when they occur!



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The calculated outlier-free mean element concentrations for each test sample and the percentage of the non-tolerable laboratory results based on the tolerable limits are provided in Table 7.

Sample 1 had a too low concentration for Pb, As and Hg, sample 2 for Cd and sample 3 for Pb and As. Consequently, their results were excluded from the evaluation. The concentrations for the lowest evaluated results are listed in Table 5. Three out of the four samples in this test were foliage samples, one was litterfall from leaves (sample 4). The concentration ranges for some heavy metals and for Boron were comparably low. As a consequence, the higher tolerable limits for samples with lower concentrations were applied in such cases (see Table 4).

Table 7: Mean element concentrations and percentages of non-tolerable results (results evaluated with the tolerable limits for low concentrations are marked in blue colour; samples having too low concentrations that have not been evaluated are marked in grey colour)

Element	Unit	Sample 1 <i>Spruce needles</i>	Sample 2 <i>Atlas Cedar needles</i>	Sample 3 <i>Spruce needles</i>	Sample 4 <i>Litterfall-leaves</i>
N	mg/g	13.21	11.28	13.75	8.41
	%	2.44	4.88	9.76	14.63
S	mg/g	0.90	0.87	0.94	2.3
	%	5.26	5.26	7.89	5.26
P	mg/g	2.27	0.86	2.46	0.66
	%	10.00	17.50	12.50	12.50
Ca	mg/g	5.48	12.02	3.05	23.59
	%	21.95	14.63	24.39	12.20
Mg	mg/g	1.32	2.30	1.32	2.96
	%	14.63	12.20	14.63	17.07
K	mg/g	8.08	4.95	3.90	6.58
	%	12.20	12.20	17.07	17.07
C	g/100g	51.31	50.40	51.54	48.28
	%	5.26	5.26	5.26	5.26
Zn	µg/g	31.38	11.28	15.72	32.57
	%	0.00	10.00	6.67	13.33
Mn	µg/g	1013.4	42.21	1256.9	157.08
	%	3.03	12.12	3.03	6.06
Fe	µg/g	67.99	120.67	60.54	352.22
	%	9.38	3.13	6.25	6.25
Cu	µg/g	3.08	3.01	3.33	5.95
	%	3.45	10.34	17.24	6.90
Pb	µg/g	0.07	0.35	0.06	1.55
	%	-	16.00	-	16.00
Cd	ng/g	68.04	18.44	49.54	41.65
	%	12.50	-	20.83	25.00
B	µg/g	2.47	42.24	17.87	43.92
	%	14.29	0.00	0.00	9.52
As	ng/g	13.33	69.27	18.58	148.18
	%	-	0.00	-	0.00
Cr	µg/g	2.67	1.25	0.75	4.14
	%	4.76	9.52	9.52	23.81
Co	µg/g	0.49	0.07	0.31	0.16
	%	11.76	5.88	5.88	11.76
Hg	ng/g	8.14	21.19	10.8	31.32
	%	-	17.65	17.65	17.65
Ni	µg/g	8.08	1.005	4.20	2.57
	%	0.00	23.81	0.00	23.81

3.3 Comparison of the 28th Interlaboratory Comparison Test with former tests

Sample 4 of the 24th Interlaboratory Comparison Test and sample 1 of the 28th Interlaboratory Comparison Test are identical (*Spruce needles - Austria*). For most of the elements the mean values are identical (see Table 8). The well comparable results (determined by the outlier-free evaluation) show that the contents of this sample are stable.

The ringtest is evaluated on the basis of fixed limits (Tables 3 and 4). These tolerable deviations from the mean were updated in Foliage Expert Panel Meetings in Bonn (1999), Prague (2003), Madrid (2007) and Zagreb (2017) and in the 1st Meeting of the Heads of the Laboratories in Hamburg (2009) for some elements. The maximum acceptable limits of quantification (Table 5) were defined in the 3rd Meeting of the Heads of the Laboratories in Arcachon (2011) and in the 6th Meeting of the Heads of the Laboratories in Pallanza (2017). These maximum acceptable limits were applied from the 14th to the 28th test. The changes of the percentages of non-tolerable results from the 12th to the 28th test are accessible in Tables 9a and 9b.

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Table 8: Comparison between sample 4 of the 24th and sample 1 of the 28th Interlaboratory Comparison Test

Element (Unit)	24 th Interlaboratory Comparison Test 2021/22 (Sample 4)		28 th Interlaboratory Comparison Test 2025/26 (Sample 1)	
	Mean	Number of Labs	Mean	Number of Labs
N mg/g	13.33	42	13.21	41
S mg/g	0.93	39	0.90	38
P mg/g	2.29	41	2.27	40
Ca mg/g	5.49	42	5.48	41
Mg mg/g	1.34	42	1.32	41
K mg/g	8.17	42	8.08	41
C g/100g	51.73	39	51.31	38
Zn µg/g	31.39	34	31.38	30
Mn µg/g	993.61	36	1013.44	33
Fe µg/g	65.58	34	67.99	32
Cu µg/g	3.10	33	3.08	29
Pb µg/g	0.067	23	0.07	25
Cd ng/g	70.50	23	68.04	24
B µg/g	2.43	22	2.47	21
As ng/g	12.96	12	13.33	13
Cr µg/g	2.68	21	2.67	21
Co µg/g	0.50	17	0.49	17
Hg ng/g	7.81	15	8.14	17
Ni µg/g	7.97	25	8.08	21

Table 9a: Percentage of non tolerable results from the 13th to the 20th test

Element	Tolerable limits normal (low ¹⁾) (± %)	13 th Labtest 2010/2011		14 th Labtest 2011/2012		15 th Labtest 2012/2013		16 th Labtest 2013/2014		17 th Labtest 2014/2015		18 th Labtest 2015/2016		19 th Labtest 2016/2017		20 th Labtest 2017/2018	
		Non tolerable (%)	Number of mean values	Non tolerable (%)	Number of mean values	Non tolerable (%)	Number of mean values	Non tolerable (%)	Number of mean values	Non tolerable (%)	Number of mean values	Non tolerable (%)	Number of mean values	Non tolerable (%)	Number of mean values	Non tolerable (%)	Number of mean values
N	10 (15)	4,9	224	8,9	224 ¹⁾	6,0	216	3,1	196	2,1	192	7,9	164 ¹⁾	4,6	152	3,7	164 ¹⁾
S	15 (20)	13,9	208	12,7	220 ¹⁾	13,9	208	14,8	196	9,9	192	6,4	156 ¹⁾	7,4	148	16,7	156 ¹⁾
P	10 (15)	7,4	216 ¹⁾	15,9	220 ¹⁾	9,4	224	18,8	208	14,7	204	15,5	168 ¹⁾	15,4	164	18,3	180 ¹⁾
Ca	10 (15)	8,0	212	14,7	224 ¹⁾	12,1	224 ¹⁾	16,3	208	17,7	212	9,1	176 ¹⁾	11,3	168 ¹⁾	12,0	184 ¹⁾
Mg	10 (15)	5,7	212	19,3	228 ¹⁾	5,9	220	8,8	204	12,3	212	14,2	176 ¹⁾	13,1	168	10,9	184
K	10 (15)	8,5	212	21,0	228 ¹⁾	18,0	228	9,1	208	11,5	208	15,6	180 ¹⁾	16,7	168	14,7	184
C	5	6,3	192	15,4	208	7,7	196	10,0	180	7,8	180	9,5	148	8,1	136	7,9	152
Zn	15 (20)	9,7	176 ¹⁾	4,4	184	5,4	184 ¹⁾	5,6	180 ¹⁾	8,1	172	13,5	148	12,1	132	6,3	144 ¹⁾
Mn	15 (20)	4,8	188	6,8	192	0,5	188	8,7	184	3,9	180	6,1	148	8,8	136	10,5	152 ¹⁾
Fe	20 (30)	0,0	180	14,1	184	3,7	188	9,4	180	6,5	168	12,2	148	13,3	128	4,2	144
Cu	20	9,1	176	10,3	184	9,1	176	14,5	172	15,7	172	4,2	144	15,2	132	8,8	136
Pb	30 (40)	12,5	112 ¹⁾	15,6	128 ¹⁾	8,6	105 ²⁾	10,7	56 ²⁾	7,8	87 ²⁾	16,0	75 ¹⁾⁽²⁾	7,7	24 ²⁾	8,3	24 ²⁾
Cd	30	9,5	116	10,0	140	7,1	140	4,8	62 ²⁾	14,3	112	8,0	112	2,1	96	2,7	75 ²⁾
B	20 (30)	3,3	92	12,0	100 ¹⁾	5,0	100	6,3	96	5,0	100	11,9	84 ¹⁾	13,9	72	6,8	88
As^{*)}	20 (30)	-	-	-	-	-	-	-	-	-	-	19,2	52 ¹⁾	25,6	39 ¹⁾⁽²⁾	48,7	39 ¹⁾⁽²⁾
Co^{*)}	25 (35)	-	-	-	-	-	-	-	-	-	-	13,2	68 ¹⁾	4,4	68	11,8	51 ²⁾
Cr^{*)}	25 (35)	-	-	-	-	-	-	-	-	-	-	10,9	46 ¹⁾⁽²⁾	16,3	92 ¹⁾	15,2	92
Hg^{*)}	20 (30)	-	-	-	-	-	-	-	-	-	-	4,5	44 ¹⁾	19,6	56 ¹⁾	0,0	36 ¹⁾⁽²⁾
Ni^{*)}	20 (30)	-	-	-	-	-	-	-	-	-	-	8,3	96 ¹⁾	7,6	92	16,3	92 ¹⁾

¹⁾ special tolerable limits for low concentrations

²⁾ sample/s excluded because of very low concentration

^{*)} Only experimentally evaluated at this stage

Table 9b: Percentage of non tolerable results from the 21st to the 28th test

Element	Tolerable limits normal (low ¹⁾) (± %)	21 st Labtest 2018/2019		22 nd Labtest 2019/2020		23 rd Labtest 2020/2021		24 th Labtest 2021/2022		25 th Labtest 2022/2023		26 th Labtest 2023/2024		27 th Labtest 2024/2025		28 th Labtest 2025/2026	
		Non tolerable (%)	Number of mean values	Non tolerable (%)	Number of mean values	Non tolerable (%)	Number of mean values	Non tolerable (%)	Number of mean values	Non tolerable (%)	Number of mean values	Non tolerable (%)	Number of mean values	Non tolerable (%)	Number of mean values	Non tolerable (%)	Number of mean values
N	10 (15)	16,1	180	5,1	156	4,7	172	8,9	168	1,3	156	0,0	152	7,7	156	7,9	164
S	15 (20)	16,9	172	11,4	140	11,9	160	10,3	156	12,1	140	8,8	136	12,5	144	5,9	152
P	10 (15)	16,3	184	9,0	156	16,7	168	7,3	164	12,2	148	6,9	144	15,0	160	13,1	160
Ca	10 (15)	15,8	184	12,5	160	15,3	176	10,1	168	15,1	152	9,0	144 ¹⁾	12,5	160	18,3	164
Mg	10 (15)	10,1	188	10,6	160	7,4	176	8,3	168	10,5	152	10,4	144	18,1	160	14,6	164
K	10 (15)	16,5	188	12,5	160	11,4	176	10,1	168	3,9	152	4,9	144	19,4	160	14,6	164
C	5	14,3	168	2,9	140	3,8	156	7,7	156	2,8	144	4,3	140	9,0	144	5,3	152
Zn	15 (20)	5,3	152	10,0	140	9,0	144	6,6	136	4,3	116	8,9	124 ¹⁾	7,0	128	7,5	120 ¹⁾
Mn	15 (20)	3,2	156	11,5	148	9,2	152 ¹⁾	2,8	144	4,0	124	6,3	128	2,2	136	6,1	132
Fe	20 (30)	5,0	140	6,9	144	8,1	136	2,9	136	5,2	116	7,3	124	3,9	128	6,3	128
Cu	20	6,8	148	12,5	136	7,9	140	6,8	132	7,1	112	6,7	120	10,9	128	9,5	116
Pb	30 (40)	7,1	84 ^{1/2)}	22,7	75 ^{1/2)}	16,7	78 ^{1/2)}	4,3	46 ^{1/2)}	3,6	84 ^{1/2)}	19,7	66 ^{1/2)}	13,1	84 ^{1/2)}	16,0	44 ^{1/2)}
Cd	30	10,3	116	14,6	48 ²⁾	8,0	50 ²⁾	0,0	92	4,2	96	1,4	72 ²⁾	12,5	104	19,4	62 ²⁾
B	20 (30)	4,3	92	13,1	84	10,9	92	11,4	88 ¹⁾	5,0	80	8,3	84	13,6	88	6,0	83 ¹⁾
As	20 (30)	19,6	56 ¹⁾	37,5	48 ¹⁾	27,1	48 ¹⁾	11,1	36 ^{1/2)}	9,6	52 ^{1/2)}	3,0	33 ^{1/2)}	1,9	52 ¹⁾	0,0	26 ²⁾
Co	25 (35)	20,6	63 ²⁾	21,9	48 ^{1/2)}	19,0	42 ^{1/2)}	7,4	68 ¹⁾	5,4	56 ²⁾	0,0	56 ¹⁾	8,7	92	8,8	62 ¹⁾
Cr	25 (35)	21,7	92 ¹⁾	6,3	32 ^{1/2)}	7,2	69 ²⁾	9,5	84 ¹⁾	7,5	80 ¹⁾	7,4	54 ^{1/2)}	16,1	56 ¹⁾	11,9	83 ¹⁾
Hg	20 (30)	6,3	48 ^{1/2)}	9,5	42 ^{1/2)}	8,3	60 ¹⁾	9,8	51 ^{1/2)}	11,5	52 ¹⁾	12,5	48 ^{1/2)}	6,1	49 ^{1/2)}	17,6	50 ^{1/2)}
Ni	20 (30)	9,0	100	18,0	100 ¹⁾	13,0	100 ¹⁾	3,0	100 ¹⁾	4,3	92	9,4	96 ¹⁾	5,4	92	11,9	83

¹⁾ special tolerable limits for low concentrations²⁾ samples excluded because of very low concentration

3.4 Evaluation by element

3.4.1 Nitrogen

In comparison with the last Interlaboratory Comparison Test the percentage of non-tolerable results of all laboratories was quite constant (7.7% → 7.9%). One laboratory failed with all four samples (F19).

A requalification is obligatory for the *ICP-Forests laboratory F19*.

3.4.2 Sulphur

In comparison with the last Interlaboratory Comparison Test the percentage of non-tolerable results of all laboratories decreased distinctly (12.5% → 5.9%). One laboratory failed in analyzing all four samples correctly (A91). Laboratory A91 failed with this parameter in the last test, too.

3.4.3 Phosphorus

In comparison with the last Interlaboratory Comparison Tests the percentage of non-tolerable results was quite constant (15.0% → 13.1%). One laboratory failed in analyzing three out of four samples correctly (A62); a second lab failed with all four samples (A43). Both laboratories failed with this parameter in the last test, too.

A requalification is obligatory for the *ICP-Forests laboratories A43 and A62*.

3.4.4 Calcium

In comparison with the last Interlaboratory Comparison Tests the percentage of non-tolerable results increased (12.5% → 18.3%). Two laboratories failed in analyzing three out of four samples correctly (F18 and F19); all four samples were not determined correctly by four labs (A42, A62, A88 and A91). Laboratory A88 failed with this parameter in the last test, too.

A requalification is obligatory for the *ICP-Forests laboratories A62, F18 and F19*.

3.4.5 Magnesium

In comparison with the last test, the percentage of non-tolerable results decreased slightly (18.1% → 14.6%). Four laboratories failed in analyzing three out of four (A62, A91, F27 and S22) and two laboratories in analysing all four samples correctly (A57 and A97). Laboratories A62, F27 and S22 failed with this parameter in the last test, too.

A requalification is obligatory for the *ICP-Forests laboratories A62, F27 and S22*.

3.4.6 Potassium

Compared to the last test, the percentage of non-tolerable results decreased (19.4% → 14.6%). Three laboratories failed with three out of four samples (A42, F27 and S22) and three laboratories in analysing all four samples (A62, A91 and A97). Laboratories A91, F27 and S22 failed with this parameter in the last test, too.

A requalification is obligatory for the *ICP-Forests laboratories A62, F27 and S22*.

3.4.7 Carbon

In comparison with the last test, the percentage of non-tolerable results decreased slightly (9.0% → 5.3%). Two laboratories failed in analyzing all four samples correctly (A91 and A97). When using an elemental-analyzer, consequently decreased (or increased) percentages of recovery of all four samples might indicate a calibration error.

3.4.8 Zinc

In comparison with the last Interlaboratory Comparison Test the percentage of non-tolerable results remained on a constant level (7.0% → 7.5%). Two laboratories failed with three out of four samples (A97 and F24).

A requalification is obligatory for the *ICP-Forests laboratory F24*.

3.4.9 Manganese

In comparison with the last Interlaboratory Comparison Test the percentage of non-tolerable increased slightly (2.2% → 6.1%). One laboratory failed in analyzing all four samples correctly (A43).

A requalification is obligatory for the *ICP-Forests laboratory A43*.

3.4.10 Iron

In comparison with the last Interlaboratory Comparison Test the percentage of non-tolerable results increased slightly (3.9% → 6.3%). One laboratory failed in analyzing all four samples correctly (A97).

3.4.11 Copper

In comparison with the last test the percentage of non-tolerable results was quite constant (10.9% → 9.5%). One laboratory failed with three out of four samples (F24) and one laboratory in analysing all four samples correctly (A97).

A requalification is obligatory for the *ICP-Forests laboratory F24*.

3.4.12 Lead

Samples 1 and 3 had to be excluded from the ringtest evaluation, because of a too low lead concentration. In comparison with the last test the percentage of non-tolerable results increased slightly (14.5% → 16.0%). Sample 2 had a lower lead concentration than the limit of the lower concentration range (< 0.5 µg/g). Two laboratories failed with two out of two evaluated samples (A97 and F24); for two laboratories A56 and F19 one sample failed because of a too high limit of quantification (LOQ). Laboratory F24 failed with this parameter in the last test, too.

Overall, the ICP-MS method appears to be the best analytical choice to analyze the comparably low concentrations of this parameter. This is quite well reflected in a clearly lower proportion of failed results, also when the results of previous tests are included.

3.4.13 Cadmium

Sample 2 had to be excluded from the ringtest evaluation, because of a too low cadmium concentration. In comparison with the last Interlaboratory Comparison Tests the percentage of non-tolerable results increased distinctly again (26th test: 1.4% → 27th test: 12.5% → 28th test: 19.4%). One laboratory failed in analyzing two out of three (F07) and three laboratories in analysing all three samples correctly (A49, A97 and F19). Laboratory A49 failed because of a too high limit of quantification (LOQ); for laboratory F19, one sample failed because of a too high LOQ.

A requalification is obligatory for the *ICP-Forests laboratories A49, F07 and F19*.

3.4.14 Boron

In comparison with the last test the percentage of non-tolerable results decreased distinctly (13.6% → 6.0%). Sample 1 had a lower lead concentration than the limit of the lower concentration range (< 5 µg/g). For laboratory A49, one sample failed because of a too high LOQ. No laboratory failed with three or four samples; therefore, no requalification is necessary for this element in this interlaboratory comparison.

3.4.15 Arsenic

In comparison with the last test the percentage of non-tolerable results decreased slightly (1.8% → 0%). Samples 1 and 3 had a lower arsenic concentration than the limit of the lower concentration range (< 50 ng/g). No laboratory failed with any sample for this parameter in this test; hence no requalification will be necessary for this element.

3.4.16 Chromium

In comparison with the last Interlaboratory Comparison Test the percentage of non-tolerable results increased slightly (8.7% → 11.9%). Sample 3 had a lower chromium concentration than the limit of the lower concentration range (< 1 µg/g). Laboratory F03 failed in analyzing three out of four samples correctly.

3.4.17 Cobalt

In comparison with the last Interlaboratory Comparison Test the percentage of non-tolerable results decreased (13.2% → 8.8%). Sample 2 had a lower cobalt concentration than the limit of the lower concentration range (< 0.1 µg/g). One laboratory failed in analyzing all four samples correctly (A49); all of these samples failed because of a too high limit of quantification (LOQ).

A requalification is obligatory for the *ICP-Forests laboratory A49*.

3.4.18 Mercury

In comparison with the last Interlaboratory Comparison Tests the percentage of non-tolerable results increased distinctly after previously decreasing (26th test: 12.5% → 27th test: 6.1% → 28th test: 17.6%). Sample 1 had to be excluded from the ringtest evaluation, because of its too low mercury-content. Samples 2, 3 and 4 had a lower mercury concentration than the limit of the lower concentration range (< 50 ng/g). Laboratory A82 failed in analyzing two out of three samples correctly; laboratories A97 and F24 failed with all three evaluated samples.

A requalification is obligatory for the *ICP-Forests laboratory F24*.

3.4.19 Nickel

In comparison with the last Interlaboratory Comparison Tests the percentage of non-tolerable results increased distinctly (5.4% → 11.9%). No laboratory failed with three or four samples; hence no requalification will be necessary for this element.

4 CONCLUSIONS

43 laboratories in 23 countries participated in the 28th Needle/Leaf Interlaboratory Comparison Test.

A system for qualification and re-qualification started with the 11th test in 2009. This system was enlarged after the manual update in 2010 to all ICP-Forests partners (see Fürst et al. 2020, König et al. 2013, Rautio et al. 2013 and 2020, Ukonmaanaho et al. 2020). With the ring test report, each participant received a qualification report which can be downloaded from the webpage (https://bfw.ac.at/ws/ring_nadel.login). It has been decided to qualify the results of each parameter separately. A laboratory is qualified if at least 50% of the results for each parameter for the evaluated samples are within the tolerable limits. A qualification is mandatory for all *ICP-Forests laboratories* if monitoring results (foliage, litterfall, ground vegetation) for the growing season 2025 are to be submitted to the PCC.

In case of an unsuccessful participation, a re-qualification is obligatory for ICP-Forests laboratories and possible for all participating laboratories (see: <https://bfw.ac.at/rz/bfwcms2.web?dok=3002>). Only a successful participation in the following ringtest for the element(s) which had to be requalified can successfully complete the re-qualification.

If an ICP-Forests laboratory did not qualify and did not make efforts to improve the data quality, ICP Forests PCC will inform the National Focal Centre about the consequence that their data possibly cannot be used for evaluations on a European level.

The usage of maximum acceptable limits of quantification (LOQ) has been included since the 14th Interlaboratory Test. These limits are needed, because many laboratories are using multi element methods (mostly ICP-AES) with higher LOQs for some elements. But for evaluation and classification of the foliage, litterfall and ground vegetation monitoring samples *real* measured results and sufficiently low LOQs are sometimes needed. The Working Group QA/QC in Laboratories received a task to fix this problem from the Expert Panel Foliage and Litterfall (12th Meeting - Tallinn 2011). Maximum acceptable LOQs for mandatory and optional parameters for foliage, litterfall and ground vegetation were discussed and accepted in the 3rd Meeting of the Heads of the Laboratories (Arcachon 2011) and in the 6th Meeting of the Heads of the Laboratories (Pallanza 2017).

The following laboratories submitted LOQs higher than the maximum acceptable LOQs: **A49** for Pb, Cd, B and Co and F19 for Pb and Cd. These data were labelled for submission to the PCC.

In case of very low concentrations in the test samples, results of these samples were excluded from the evaluation (this was the case for **sample 1**: Hg, As and Pb, **sample 2**: Cd and **sample 3**: As and Pb in the present test). Excluding these samples was necessary to avoid inaccurate qualification results caused by calculations which can be then too unreliable. Furthermore, there is seldom a practical need to detect these low concentrations in natural foliage samples, because it gives no additional information of the nutrient status or about the pollution impact situation.

Regarding to the overall proportion of correct results during the 28th Needle/Leaf Interlaboratory Comparison test, it is likely that the following participating laboratories with a percentage below 80% have QC/QA-problems, miscalculations of the results and/or methodological problems:

F27 (78.95%), **S22** (78.57%), **F19** (77.05%), **F24** (71.70%), **A42** (55.00%), **A43** (50.00%), **A62** (50.00%), **A97** (39.39%) and **A91** (25.00%)

Some of the *ICP-Forests laboratories* failed and a re-qualification **is obligatory** for certain parameters (**A43**: P, Mn; **A49**: Cd, Co; **A62**: Ca, K, Mg, P; **F07**: Cd; **F18**: Ca; **F19**: N, Ca, Cd; **F24**: Zn, Cu, Hg; **F27**: K, Mg; and **S22**: K, Mg). These *ICP-Forests laboratories* have to check and re-validate their methods or employ better applicable methods. FFCC offers ringtest materials from previous tests which were evaluated with outlier-free means as well, if some of these materials are needed for this purpose (see: <https://bfw.ac.at/rz/bfwcms2.web?dok=5146>).

The laboratories A43 (P), A49 (Cd, Co), A62 (Mg, P), A88 (Ca), F24 (Pb), F27 (Mg, K) and S22 (Mg, K) failed with the same parameters in this test and the last test. **Therefore, QA/QC-problem or their methodological problem is not yet solved.**

All laboratories are invited to take part in the re-qualification program that starts up from now till 1st of September 2026 (see details to the procedure and the needed documents: <https://bfw.ac.at/rz/bfwcms2.web?dok=7830>). Deadline for submission of the resubmission results is 2nd of August 2026.

As far as the most frequently used analytical methods are concerned, the microwave digestion method is the most common digestion method. With this respect, a clear recommendation for ICP-AES as determination method can be given. Where ICP-AES is not sensitive enough, ICP-AES with ultrasonic nebulizer or better ICP-MS are recommended. For determinations of nitrogen and carbon, element analyzers are the best choice.

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List of participating laboratories

Austria

A 10 Land Steiermark

Referat Boden- und Pflanzenanalytik
Ragnitzstraße 193
8047 - Graz

Bundesforschungszentrum für Wald

Pflanzenanalyse
Seckendorff-Gudent-Weg 8
A-1131 - Vienna

Belgium / Flanders

Research Institute for Nature and Forest

INBO laboratory
Gaverstraat 35
B-9500 - Geraardsbergen

Belgium/Wallonia

Université of Louvain

MOCA
Croix du Sud 1 - Boltzmann - A073
B-1348 - Louvain-La-Neuve

Croatia

HRVATSKI SUMARSKI INSTITUT

Division for forest ecology
Cvjetno naselje 41
HR-10450 - Jastrebarsko

Czech Republic

Forestry and Game Management Res. Inst.

Testing Laboratories (25)
Strnady 136
CZ-25202 - Jiloviste

Denmark

Geosciences & Natural Resources Manageme

BioGeoLab
Rolighedsvej 23
DK-1958 - Frederiksberg C

Estonia

Estonian Environmental Research Centre

Tartu Department
Vaksali 17a
EST-50410 - Tartu

Finland

Natural Resources Institute Finland

Viikki B2
Latokartanonkaari 9
FIN-00790 - Helsinki

France

INRA

USRAVE
71, ave E. Bourlaux CS20032
33 882 - Villenave d'Ornon Cedex

Germany

Bay. LA f. Wald u. Forstwirtschaft

Stabsstelle S.3 - Zentrallabor
Hans-Carl-von-Carlowitz-Platz 1
D-85354 - Freising

Bayerisches Landesamt für Umwelt

Referat 72 - Schwermetallanalytik
Bürgermeister-Ulrich-Straße 160
86179 - Augsburg

Fraunhofer IME

Trace Analysis and Environmental Monitor
Auf dem Aberg 1
57392 - Schmallenberg

FVA-Baden-Württemberg

Abt. Boden und Umwelt
Wonnhaldestraße 4
D-79100 - Freiburg

HNE Eberswalde

Zentrales ökologisches Labor
Schicklerstraße 5
D-16225 - Eberswalde

Germany

LANUV Nordrhein-Westfalen

LANUV; FB 65
Gartenstraße 27
D-45699 - Herten

LECO Instrumente GmbH

LECO EATC Berlin
Max-Dohrn-Str. 8-10
10589 - Berlin

LMS Agrarberatung GmbH

LUFA Rostock
Graf-Lippe-Str. 1
D-18059 - Rostock

LUFA NRW

Zentrale anorganische Analytik
Nevinghoff 40
48147 - Münster

LUFA NRW

Spezielle Analytik
Nevinghoff 40
D-48147 - Münster

LUFA Speyer

Abt. 3 Referat 2
Obere Langgasse 40
D-67346 - Speyer

Nordwestdeutsche Forstl.Versuchsanstalt

Abt. D, Umweltanalytik
Grätzelstr. 2
D-37079 - Göttingen

Ökopedologie der Tropen u.Subtropen -PTS

PTS-Labor - Kerstin Langs
Büsgenweg 2
D-37077 - Göttingen

Staatsbetrieb Sachsenforst

Abt. 4 Ref. 43
Bonnewitzer Str. 34
D-01796 - Pirna OT Graupa

Germany

Thuer. Landesamt f. Landw. (TLLLR)

Untersuchungswesen
Naumburger Str. 98
07743 - Jena

Greece

Forest Research Institute of Athens

Forest Soils
Terma Alkmanos
115 28 - Athens

Hungary

University of Sopron

Forest Research Institute, Ecology Lab.

H-9400 - Sopron

Ireland

Southern Scientific Services Ltd

Chemistry Laboratory
4Park Business Centre, Farranfore
V93 E220 - Co. Kerry

Latvia

LSFRI Silava

Forest environment laboratory
Riga street 111
LV-2169 - Salaspils

Norway

Chemistry, NTNU

ICP-MS
Institutt for kjemi, NTNU
7491 - Trondheim

Norwegian Institute of Bioeconomy Research

Chemical Laboratories
Pb 115
NO-1431 - As

Poland

Forest Research Institute

Lab. of Natural Environment Chemistry
3, Braci Lesnej
PL-05-090 - Sekocin Stary

Romania

INCDS

Chemistry laboratory
Calea Bucovinei, 73 bis
725100 - Campulung Moldovenesc

INCDS

Lab. de analize pedologice si foliare
Closca no 13
500040 - Brasov

INCDS MARIN DRACEA

Forestry-Ecology Laboratory
B-dul Eroilor, nr.128
RO-077190 - Voluntari-Jud. Ilfov

Serbia

Inst. of Lowland Forestry and Environme

Antona Cehova 13d
21000 - Novi Sad

Institute of Forestry

Kneza Visaslava 3
11030 - Belgrade

Slovakia

National Forest Centre

Central Forestry Laboratory
Sokolská 2
SK-96001 - Zvolen

Slovenia

Slovenian Forestry Institute

Laboratory of Forest Ecology
Vecna pot 2

SI-1000 - Ljubljana

Spain

Universidad de Navarra

Departamento de Química

Irunlarrea, 1

31008 - Pamplona (Navarra)

Switzerland

Eidg. Forschungsanstalt WSL

Central Laboratory

Zürcherstrasse 111

CH-8903 - Birmensdorf

Turkey

Ege Forestry Research Institute

Soil and Ecology Laboratory

Mustafa Kemal Blv. No: 75 Zeytinalani

35430 - Izmir

United Kingdom

Forest Research

Environmental Research Laboratory

Alice Holt Lodge

GU10 4LH - Farnham, Surrey

Method Codes – Pretreatment (P)

Extraction methods

PA06	Extraction with diluted HNO ₃
PA99	Other extraction method

Digestion methods (open system)

PB02	Open digestion with H ₂ SO ₄ /H ₂ O ₂
PB03	Open digestion with HNO ₃
PB04	Open digestion with HNO ₃ /H ₂ SO ₄
PB05	Open digestion with HNO ₃ /H ₂ O ₂
PB06	Open digestion with HNO ₃ /HClO ₄
PB07	Kjeldahl H ₂ SO ₄ with Se or Cu catalyst
PB08	Modified Kjeldahl H ₂ SO ₄ with Ti/Cu catalyst
PB99	Other digestion method (open system)

Pressure digestion methods

PC01	Pressure digestion HNO ₃
PC02	Pressure digestion HNO ₃ /H ₂ O ₂
PC03	Pressure digestion HNO ₃ /HF (total digestion)
PC99	Other pressure digestion method

Microwave pressure digestion methods

PD01	Microwave pressure digestion HNO ₃
PD02	Microwave pressure digestion HNO ₃ /H ₂ O ₂
PD03	Microwave pressure digestion HNO ₃ /H ₂ O ₂ /HCl
PD04	Microwave digestion HNO ₃ /HClO ₄
PD05	Microwave pressure digestion HNO ₃ /HF (total digestion)
PD99	Other microwave pressure digestion method

Dry ashing digestion methods

PE01	Oxygen ashing (Schöniger)
PE99	Other dry ashing method

Other methods

PZ01	Material melted and formed (tablet) for XRF methods
PZ02	Material pressed (pellet) for XRF methods
PZ98	No pretreatment
PZ99	Pretreatment method not in this list

Method Codes – Determination (D)

Element analyzer

DA01	Macro Elemental-analyzers for C, N or S for solids (Sample > 100mg)
DA02	Micro Elemental-analyzers for C, N or S for solids (Sample ≤ 100mg) with an extra milling step
DA05	Hg-Analyzer
DA99	Other Element analyzer method

Atomic Absorption or Emission Spectroscopy

DB01	AAS-flame technique (C ₂ H ₂ /Air)
DB02	AAS-flame technique (C ₂ H ₂ /N ₂ O)
DB03	AAS-cold vapor technique
DB04	AAS-hydride technique
DB05	AAS-flameless (electrothermal technique)
DB06	AES-Flame technique (Flame photometry)
DB07	AFS-hydride-technique
DB08	ICP-AES without Ultrasonic nebulisation
DB09	ICP-AES with Ultrasonic nebulisation
DB10	ICP-MS
DB99	Other Atomic Absorption or Emission Spectroscopy method

Physical techniques

DD01	X-ray-energy dispersive
DD02	X-ray-wavelength dispersive
DD99	Other physical technique

UV-VIS Spectrophotometry techniques

DE01	UV-VIS-spectrophotometry-technique
DE03	Continuous flow UV-VIS-spectrophotometry-technique
DE05	Flow injection UV-VIS-spectrophotometry-technique
DE99	Other UV-VIS Spectrophotometry technique

Electrochemical methods

DF03	Ion selective electrodes (except pH-Electrodes)
DF08	Other potentiometric titration
DF99	Other electrochemical method

Other methods

DZ02	N-Determination (after Kjeldahl digestion)
DZ99	Detection method not in this list

List of abbreviations

No.	Number of results ordered by Lab. mean
Lab. Code	Code of the laboratory / Laboratories that analyse level II samples are marked with x
P	Code for pre-treatment method (s. method code pre-treatment)
D	Code for determination method (s. method code determination)
Lab. Mean	Mean of the results of each laboratory without outliers type 1
n	Number of all results from all laboratories without outliers type 1, 2, 3
l	Number of all laboratories without outliers type 2, 3
Mean	Total mean value from all results without outliers type 1, 2, 3
s_i	Standard deviation from each laboratory without outliers type 1
s_r	Mean Standard deviation for all laboratories without outliers type 1, 2, 3
V_i	$s_i * 100 / \text{Lab. Mean}$ (marked in red if >10%)
CV_r	$s_r * 100 / \text{Mean}$
s_R	Standard deviation from all results without outliers
CV_R	$s_R * 100 / \text{Mean}$
Recovery %	$\text{Lab.mean} * 100 / \text{Mean}$
a	Outlier type 1
b	Outlier type 2
c	Outlier type 3
*	Non-tolerable mean value from a laboratory (see Tables 3 & 4)
**	Higher than the maximum acceptable limit of quantification (see Table 5)
LOQ	Limit of quantification

Annex - Results

Mandatory parameters (N, S, P, Ca, Mg, K, C)

Optional parameters (Zn, Mn, Fe, Cu, Pb, Cd, B, As, Cr, Co, Hg, Ni)

Additional parameters

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: N

Sample: 1

Unit: mg/g

No.	Lab. Code	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery %
		P	D	1	2	3	4				s _i	V _i	
1	F19x	PZ98	DA01	1,24	1,24	1,26	1,26	0	1,25	b *	0,01	0,92	9,46
2	A97	PZ98	DA01	12,13	11,70	12,17	12,02	4	12,01		0,21	1,77	90,86
3	A43x	PB08	DZ02	12,14	12,14	12,14	12,14	4	12,14		0,00	0,00	91,88
4	F12x	PZ98	DA01	12,30	12,26	12,31	12,25	4	12,28		0,03	0,24	92,94
5	F25x	PZ98	DA01	12,35	12,33	12,27	12,28	4	12,31		0,04	0,31	93,14
6	A36	PB07	DZ02	12,73	12,63	12,73	12,63	4	12,68		0,06	0,46	95,96
7	A57	PZ98	DA01	12,90	12,75	12,75	12,58	4	12,75		0,13	1,03	96,46
8	S22x	PZ98	DA02	14,00	12,00	12,00	13,00	0	12,75	c	0,96	7,51	96,49
9	A88	PB07	DZ02	12,90	12,50	12,90	12,90	4	12,80		0,20	1,56	96,87
10	A47x	PZ98	DA02	12,94	12,92	12,74	12,88	4	12,87		0,09	0,70	97,40
11	A60x	PZ98	DA02	13,11	12,44	13,12	13,27	4	12,99		0,37	2,85	98,27
12	F24x	PZ98	DA02	12,90	13,10	13,20	12,80	4	13,00		0,18	1,40	98,39
13	F32	PZ98	DA01	13,00	13,00	12,90	13,10	4	13,00		0,08	0,63	98,39
14	F03x	PZ98	DA01	13,22	13,01	12,85	13,11	4	13,05		0,16	1,20	98,74
15	A65	PZ98	DA02	13,68	12,57	13,10	13,04	4	13,10		0,45	3,47	99,12
16	A86	PZ98	DA01	13,17	13,09	13,07	13,08	4	13,10		0,05	0,35	99,16
17	F14x	PZ98	DA01	13,30	13,10	13,10	13,00	4	13,13		0,13	0,96	99,33
18	F07x	PZ98	DA01	13,08	13,28	12,75	13,43	4	13,14		0,29	2,24	99,41
19	F06x	PZ98	DA02	13,21	13,09	13,15	13,21	4	13,17		0,06	0,44	99,63
20	F21x	PZ98	DA01	13,14	13,20	13,18	13,16	4	13,17		0,03	0,20	99,67
21	A61x	PZ98	DA02	13,02	13,42	13,26	13,09	4	13,20		0,18	1,36	99,88
22	F13x	PZ98	DA01	13,40	13,40	13,00	13,10	4	13,23		0,21	1,56	100,09
23	F05x	PZ98	DA01	13,21	13,27	13,24	13,22	4	13,24		0,03	0,20	100,16
24	A45	PZ98	DA01	13,50	13,30	13,10	13,10	4	13,25		0,19	1,45	100,28
25	F02x	PZ98	DA01	13,15	13,12	13,31	13,46	4	13,26		0,16	1,19	100,35
26	F26x	PB08	DZ02	13,31	13,30	13,31	13,30	4	13,31		0,01	0,04	100,69
27	F15x	PZ98	DA01	13,34	13,40	13,28	13,41	4	13,36		0,06	0,45	101,09
28	F01	PB08	DZ02	13,35	13,20	13,41	13,47	4	13,36		0,12	0,87	101,09
29	F18x	PB07	DZ02	13,30	13,40	13,40	13,40	4	13,38		0,05	0,37	101,22
30	F28	PZ98	DA01	13,60	13,50	13,60	13,50	4	13,55		0,06	0,43	102,55
31	F16x	PZ98	DA02	13,60	13,75	13,46	13,61	4	13,61		0,12	0,87	102,96
32	A49x	PZ98	DA99	14,86	13,62	13,11	12,99	0	13,65	c	0,85	6,26	103,27
33	A62x	PZ98	DA01	13,70	13,70	13,60	13,60	4	13,65		0,06	0,42	103,30
34	F33x	PZ98	DA02	13,84	13,41	13,73	13,73	4	13,68		0,19	1,36	103,51
35	F08x	PZ98	DA01	14,04	13,92	13,75	13,32	4	13,76		0,32	2,30	104,11
36	A82	PZ98	DA02	13,90	13,75	13,55	13,85	4	13,76		0,15	1,12	104,16
37	A42	PZ98	DA01	14,10	13,40	14,70	13,00	0	13,80	c	0,75	5,45	104,44
38	A85x	PZ98	DA01	14,01	13,81	13,70	13,91	4	13,86		0,13	0,96	104,88
39	A91	PZ98	DA01	14,30	14,00	13,80	14,20	4	14,08		0,22	1,58	106,52
40	A56	PZ98	DA02	14,90	13,90	14,10	14,20	4	14,28		0,43	3,05	108,03
41	F27x	PZ98	DA01	14,58	14,64	14,41	14,24	4	14,47		0,18	1,25	109,49
42													
43													
44													
45													
46													
47													
48													
49													
50													
51													
52													
53													
54													
55													

n Mean s_r CV_r
all labs 148 13,21 0,146 1,106

* = non tolerable mean because more than +/-

10 % from the mean

l s_R CV_R
37 0,541 4,091

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: N

Sample: 2

Unit: mg/g

No.	Lab. Code	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery %
		P	D	1	2	3	4				s _i	V _i	
1	F19x	PZ98	DA01	1,03	1,03	1,05	1,05	0	1,04	b *	0,01	1,11	9,22
2	A97	PZ98	DA01	9,90	10,31	10,37	10,21	4	10,20		0,21	2,05	90,37
3	A43x	PB08	DZ02	10,39	10,24	10,24	10,29	4	10,29		0,07	0,69	91,19
4	F12x	PZ98	DA01	10,37	10,38	10,09a	10,32	3	10,36		0,03	0,31	91,78
5	A47x	PZ98	DA02	10,41	10,51	10,35	10,71	4	10,50		0,16	1,50	93,01
6	A57	PZ98	DA01	10,70	10,49	10,53	10,60	4	10,58		0,09	0,87	93,76
7	F25x	PZ98	DA01	10,73	10,79	10,80	10,79	4	10,78		0,03	0,30	95,51
8	F24x	PZ98	DA02	10,60	10,80	10,90	10,90	4	10,80		0,14	1,31	95,71
9	A36	PB07	DZ02	10,91	10,81	11,12	10,91	4	10,94		0,13	1,19	96,93
10	A88	PB07	DZ02	11,00	10,80	11,10	11,00	4	10,98		0,13	1,15	97,26
11	A65	PZ98	DA02	11,03	11,07	10,85	10,97	4	10,98		0,10	0,87	97,31
12	S22x	PZ98	DA02	11,00	10a	11,00	11,00	3	11,00		0,00	0,00	97,48
13	F14x	PZ98	DA01	11,16	11,13	11,19	10,59	4	11,02		0,29	2,60	97,64
14	A86	PZ98	DA01	11,09	11,13	10,98	11,00	4	11,05		0,07	0,65	97,93
15	F03x	PZ98	DA01	11,11	11,11	11,20	11,07	4	11,12		0,05	0,49	98,56
16	A61x	PZ98	DA02	11,08	11,14	11,25	11,21	4	11,17		0,08	0,67	98,99
17	F26x	PB08	DZ02	11,20	11,21	11,20	11,20	4	11,20		0,01	0,04	99,28
18	A45	PZ98	DA01	11,40	11,20	11,20	11,10	4	11,23		0,13	1,12	99,48
19	F13x	PZ98	DA01	11,10	11,40	11,10	11,40	4	11,25		0,17	1,54	99,70
20	F32	PZ98	DA01	11,30	11,30	11,40	11,30	4	11,33		0,05	0,44	100,36
21	F15x	PZ98	DA01	11,36	11,28	11,38	11,35	4	11,34		0,04	0,38	100,52
22	F21x	PZ98	DA01	11,26	11,36	11,43	11,41	4	11,37		0,08	0,67	100,72
23	F02x	PZ98	DA01	11,40	11,45	11,44	11,23	4	11,38		0,10	0,90	100,85
24	F06x	PZ98	DA02	11,23	11,73	11,44	11,28	4	11,42		0,23	1,97	101,21
25	F07x	PZ98	DA01	11,20	11,59	11,55	11,38	4	11,43		0,18	1,56	101,29
26	F05x	PZ98	DA01	11,45	11,39	11,48	11,43	4	11,44		0,04	0,33	101,36
27	F18x	PB07	DZ02	11,50	11,40	11,50	11,40	4	11,45		0,06	0,50	101,47
28	F01	PB08	DZ02	11,53	11,20	11,55	11,55	4	11,46		0,17	1,50	101,54
29	F33x	PZ98	DA02	11,41	11,41	11,30	11,94	4	11,52		0,29	2,50	102,05
30	A42	PZ98	DA01	11,90	11,70	11,20	11,30	4	11,53		0,33	2,87	102,14
31	F16x	PZ98	DA02	11,61	11,57	11,23	11,69	4	11,53		0,20	1,76	102,14
32	A60x	PZ98	DA02	11,81	11,25	11,59	11,53	4	11,55		0,23	2,00	102,31
33	F08x	PZ98	DA01	11,58	11,88	11,38	11,37	4	11,55		0,24	2,04	102,38
34	A62x	PZ98	DA01	11,70	11,70	11,60	11,70	4	11,68		0,05	0,43	103,46
35	F28	PZ98	DA01	11,60	11,60	11,80	11,80	4	11,70		0,12	0,99	103,69
36	A82	PZ98	DA02	11,80	12,10	11,30	11,65	4	11,71		0,33	2,84	103,80
37	A49x	PZ98	DA99	11,87	11,84	11,35	11,98	4	11,76		0,28	2,38	104,22
38	A85x	PZ98	DA01	11,85	11,64	12,05	11,95	4	11,87		0,18	1,48	105,22
39	A56	PZ98	DA02	12,10	12,50	12,10	11,50	4	12,05		0,41	3,42	106,79
40	A91	PZ98	DA01	12,50	12,10	11,70	12,00	4	12,08		0,33	2,74	107,01
41	F27x	PZ98	DA01	12,43	12,83	12,54	12,27	4	12,52	*	0,24	1,89	110,93
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n Mean s_r CV_r
all labs 158 11,28 0,151 1,339

* = non tolerable mean because more than +/-

10 % from the mean

l s_R CV_R
40 0,493 4,370

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: N

Sample: 3

Unit: mg/g

No.	Lab. Code	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery %
		P	D	1	2	3	4				s _i	V _i	
1	F19x	PZ98	DA01	1,29	1,29	1,30	1,30	0	1,30	b *	0,01	0,45	9,42
2	A97	PZ98	DA01	11,93	12,00	12,42	12,21	4	12,14	*	0,22	1,82	88,28
3	A43x	PB08	DZ02	12,30	12,30	12,45	12,35	4	12,35	*	0,07	0,57	89,81
4	F12x	PZ98	DA01	12,66	12,83	12,72	12,54	4	12,69		0,12	0,95	92,27
5	F25x	PZ98	DA01	12,67	12,77	12,70	12,68	4	12,71		0,05	0,35	92,39
6	A36	PB07	DZ02	13,09	12,91	13,09	13,09	4	13,05		0,09	0,69	94,87
7	A57	PZ98	DA01	13,25	13,06	13,00	12,94	4	13,06		0,13	1,03	94,99
8	F26x	PB08	DZ02	13,31	13,29	13,29	13,29	4	13,30		0,01	0,08	96,68
9	A88	PB07	DZ02	13,10	13,60	13,20	13,30	4	13,30		0,22	1,62	96,72
10	F13x	PZ98	DA01	13,30	13,50	13,30	13,40	4	13,38		0,10	0,72	97,27
11	A47x	PZ98	DA02	13,39	13,23	13,37	13,60	4	13,40		0,15	1,14	97,43
12	A86	PZ98	DA01	13,54	13,50	13,42	13,36	4	13,46		0,08	0,60	97,85
13	A65	PZ98	DA02	13,55	13,40	13,45	13,70	4	13,53		0,13	0,98	98,36
14	F07x	PZ98	DA01	13,64	13,60	13,62	13,41	4	13,57		0,11	0,78	98,67
15	F24x	PZ98	DA02	13,20	13,50	13,80	13,80	4	13,58		0,29	2,12	98,72
16	A42	PZ98	DA01	13,60	14,20	13,30	13,30	4	13,60		0,42	3,12	98,90
17	A45	PZ98	DA01	13,80	13,40	13,70	13,60	4	13,63		0,17	1,25	99,08
18	F14x	PZ98	DA01	13,70	13,60	13,70	13,60	4	13,65		0,06	0,42	99,27
19	F03x	PZ98	DA01	13,62	13,69	13,85	13,49	4	13,66		0,15	1,09	99,37
20	F06x	PZ98	DA02	13,67	13,92	13,55	13,61	4	13,69		0,16	1,19	99,54
21	A61x	PZ98	DA02	13,92	13,45	13,82	13,63	4	13,71		0,21	1,52	99,67
22	F21x	PZ98	DA01	13,81	13,69	13,73	13,66	4	13,72		0,07	0,47	99,79
23	F05x	PZ98	DA01	13,67	13,78	13,72	13,78	4	13,74		0,05	0,39	99,90
24	S22x	PZ98	DA02	13,00	13,00	14,00	15,00	0	13,75	c	0,96	6,96	99,99
25	F02x	PZ98	DA01	13,82	13,62	13,82	13,76	4	13,76		0,09	0,69	100,03
26	A60x	PZ98	DA02	14,06	13,86	13,65	13,48	4	13,76		0,25	1,83	100,08
27	F18x	PB07	DZ02	13,80	13,90	13,90	13,90	4	13,88		0,05	0,36	100,90
28	F15x	PZ98	DA01	13,93	13,92	13,90	13,89	4	13,91		0,02	0,13	101,16
29	F32	PZ98	DA01	14,10	14,00	13,90	13,90	4	13,98		0,10	0,69	101,63
30	F08x	PZ98	DA01	14,27	13,97	13,70	14,35	4	14,07		0,30	2,14	102,34
31	F28	PZ98	DA01	14,00	14,20	14,20	14,20	4	14,15		0,10	0,71	102,90
32	A82	PZ98	DA02	14,60	14,10	13,80	14,25	4	14,19		0,33	2,34	103,17
33	F16x	PZ98	DA02	14,05	14,39	14,11	14,28	4	14,21		0,16	1,10	103,32
34	F01	PB08	DZ02	14,23	14,17	14,23	14,29	4	14,23		0,05	0,34	103,48
35	A62x	PZ98	DA01	14,40	14,20	14,20	14,30	4	14,28		0,10	0,67	103,81
36	A91	PZ98	DA01	14,50	14,00	14,70	14,40	4	14,40		0,29	2,04	104,72
37	A85x	PZ98	DA01	14,43	14,54	14,64	14,33	4	14,49		0,13	0,93	105,34
38	F33x	PZ98	DA02	14,57	14,80	14,46	14,80	4	14,66		0,17	1,16	106,59
39	F27x	PZ98	DA01	14,93	15,13	14,69	14,70	4	14,86		0,21	1,41	108,08
40	A56	PZ98	DA02	15,30	15,10	14,70	14,80	4	14,98		0,28	1,84	108,90
41	A49x	PZ98	DA99	16,15	15,38	15,40	15,61	4	15,64	*	0,36	2,29	113,70
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n Mean s_r CV_r
all labs 156 13,75 0,155 1,127

* = non tolerable mean because more than +/-

10 % from the mean

l s_R CV_R
39 0,689 5,008

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: N

Sample: 4

Unit: mg/g

No.	Lab. Code	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery %
		P	D	1	2	3	4				s _i	V _i	
1	F19x	PZ98	DA01	0,79	0,79	0,83	0,83	0	0,81	b *	0,02	2,99	9,65
2	A42	PZ98	DA01	7,50	7,60	6,80	6,90	0	7,20	c *	0,41	5,67	85,60
3	A97	PZ98	DA01	7,23	7,45	7,34	7,31	4	7,33	*	0,09	1,24	87,18
4	F12x	PZ98	DA01	7,46	7,46	7,60	7,41	4	7,48	*	0,08	1,09	88,96
5	A43x	PB08	DZ02	7,44	7,59	7,59	7,54	4	7,54	*	0,07	0,94	89,64
6	A57	PZ98	DA01	7,69	7,72	7,68	7,96	4	7,76		0,13	1,71	92,29
7	F24x	PZ98	DA02	7,30	7,90	7,90	8,40	0	7,88	c	0,45	5,71	93,63
8	F25x	PZ98	DA01	8,01	8,03	7,99	7,99	4	8,01		0,02	0,24	95,17
9	A65	PZ98	DA02	8,14	7,83	8,26	7,91	4	8,04		0,20	2,48	95,53
10	F14x	PZ98	DA01	8,30	8,20	8,20	8,10	4	8,20		0,08	1,00	97,49
11	A88	PB07	DZ02	8,20	8,30	8,10	8,20	4	8,20		0,08	1,00	97,49
12	A86	PZ98	DA01	8,23	8,25	8,19	8,19	4	8,22		0,03	0,35	97,68
13	F06x	PZ98	DA02	8,13	8,19	8,35	8,24	4	8,23		0,09	1,13	97,82
14	A36	PB07	DZ02	8,29	8,40	8,18	8,18	4	8,26		0,11	1,27	98,23
15	A45	PZ98	DA01	8,37	8,21	8,32	8,30	4	8,30		0,07	0,81	98,68
16	F18x	PB07	DZ02	8,28	8,32	8,31	8,30	4	8,30		0,02	0,21	98,71
17	A61x	PZ98	DA02	8,36	8,27	8,30	8,31	4	8,31		0,04	0,45	98,80
18	F03x	PZ98	DA01	8,29	8,34	8,37	8,35	4	8,34		0,04	0,43	99,10
19	A60x	PZ98	DA02	8,36	8,39	8,39	8,33	4	8,37		0,03	0,34	99,48
20	F13x	PZ98	DA01	8,41	8,48	8,29	8,34	4	8,38		0,08	0,99	99,63
21	F32	PZ98	DA01	8,37	8,39	8,41	8,36	4	8,38		0,02	0,26	99,66
22	F01	PB08	DZ02	8,42	8,36	8,42	8,36	4	8,39		0,03	0,41	99,75
23	F26x	PB08	DZ02	8,40	8,40	8,40	8,40	4	8,40		0,00	0,00	99,87
24	A49x	PZ98	DA99	8,56	8,24	8,59	8,22	4	8,40		0,20	2,38	99,90
25	F05x	PZ98	DA01	8,40	8,43	8,41	8,42	4	8,42		0,01	0,15	100,05
26	S22x	PZ98	DA02	8,00	8,00	9,00	9,00	0	8,50	c	0,58	6,79	101,06
27	F02x	PZ98	DA01	8,47	8,60	8,51	8,53	4	8,53		0,05	0,61	101,37
28	F15x	PZ98	DA01	8,54	8,52	8,53	8,55	4	8,54		0,01	0,15	101,47
29	A85x	PZ98	DA01	8,66	8,57	8,81	8,21	4	8,56		0,26	2,98	101,80
30	A62x	PZ98	DA01	8,67	8,65	8,59	8,64	4	8,64		0,03	0,39	102,69
31	F28	PZ98	DA01	8,61	8,58	8,66	8,81	4	8,67		0,10	1,18	103,02
32	F16x	PZ98	DA02	8,56	8,76	8,72	8,68	4	8,68		0,09	1,00	103,20
33	F07x	PZ98	DA01	8,57	8,83	8,86	8,54	4	8,70		0,17	1,93	103,44
34	F08x	PZ98	DA01	8,72	8,79	8,66	8,82	4	8,75		0,07	0,83	104,02
35	A82	PZ98	DA02	8,70	8,85	8,65	8,85	4	8,76		0,10	1,18	104,18
36	F21x	PZ98	DA01	8,82	8,81	8,78	8,80	4	8,80		0,02	0,19	104,65
37	F27x	PZ98	DA01	8,69	8,69	9,06	8,91	4	8,84		0,18	2,05	105,07
38	A47x	PZ98	DA02	8,92	9,02	8,53	9,08	4	8,89		0,25	2,78	105,66
39	F33x	PZ98	DA02	9,12	9,01	9,23	8,90	4	9,07		0,14	1,57	107,78
40	A91	PZ98	DA01	9,20	9,20	9,20	9,30	4	9,23		0,05	0,54	109,68
41	A56	PZ98	DA02	9,40	9,20	9,30	9,40	4	9,33	*	0,10	1,03	110,87
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n Mean s_r CV_r
all labs **148** **8,41** **0,085** **1,010**

* = non tolerable mean because more than +/-

10 % from the mean

l s_R CV_R
37 **0,434** **5,162**

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: S

Sample: 1

Unit: mg/g

No.	Lab. Code	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery %
		P	D	1	2	3	4				s _i	V _i	
1	F33x	PD01	DB10	0,74	0,7a	0,75	0,74	3	0,74	*	0,01	0,78	82,38
2	A86	PZ98	DA01	0,79	0,80	0,79	0,83	4	0,80		0,02	2,23	88,75
3	A97	PD02	DB10	0,78	0,83	0,87	0,81	4	0,82		0,04	4,59	91,16
4	S22x	PZ98	DA02	0,82	0,82	0,83	0,83	4	0,83		0,01	0,70	91,44
5	A60x	PD01	DB10	0,82	0,81	0,84	0,83	4	0,83		0,01	1,27	91,48
6	A36	PD02	DB08	0,85	0,81	0,84	0,82	4	0,83		0,02	2,20	91,99
7	F27x	PZ98	DA01	0,94	0,80	0,89	0,72	4	0,84		0,10	11,71	92,57
8	F08x	PZ99	DB08	0,82	0,82	0,84	0,86	4	0,84		0,02	2,07	92,63
9	A56	PC01	DB08	0,88	0,82	0,89	0,81	4	0,85		0,04	4,47	94,01
10	F19x	PD02	DB08	0,90	0,85	0,78	0,93	4	0,86		0,06	7,31	95,76
11	F24x	PD02	DB99	0,89	0,86	0,89	0,88	4	0,88		0,01	1,61	97,53
12	F07x	PD03	DB08	0,88	0,88	0,89	0,89	4	0,89		0,01	0,93	98,11
13	F02x	PZ98	DA01	0,88	0,90	0,88	0,89	4	0,89		0,01	1,08	98,36
14	A82	PD01	DB08	0,89	0,91	0,90	0,90	4	0,90		0,01	0,83	99,80
15	A62x	PZ98	DA01	0,89	0,90	1,02a	0,92	3	0,90		0,02	1,69	100,12
16	A45	PB99	DB08	0,91	0,91	0,91	0,90	4	0,91		0,00	0,28	100,39
17	A90	PD99	DB10	0,87	0,88	0,91	0,97	4	0,91		0,05	4,96	100,58
18	A61x	PD01	DB08	0,91	0,92	0,92	0,91	4	0,91		0,01	0,68	101,33
19	A65	PD01	DB08	0,92	0,92	0,92	0,93	4	0,92		0,01	0,54	102,24
20	F18x	PD99	DB08	0,93	0,92	0,90	0,95	4	0,92		0,02	2,32	102,46
21	A47x	PD01	DB08	0,93	0,93	0,91	0,93	4	0,93		0,01	1,08	102,52
22	F25x	PB06	DB08	0,93	0,92	0,92	0,93	4	0,93		0,01	0,71	102,63
23	F21x	PZ98	DA01	0,95	0,94	0,92	0,92	4	0,93		0,02	1,61	103,35
24	F16x	PC01	DB08	0,93	0,93	0,94	0,93	4	0,93		0,01	0,61	103,44
25	F03x	PD02	DB08	0,95	0,93	0,94	0,92	4	0,93		0,01	1,47	103,46
26	F14x	PC01	DB08	0,94	0,94	0,94	0,93	4	0,94		0,00	0,53	103,90
27	F05x	PZ98	DA01	0,94	0,94	0,94	0,93	4	0,94		0,00	0,32	103,93
28	A85x	PZ98	DA01	0,98	0,91	0,93	0,95	4	0,94		0,03	3,17	104,46
29	F28	PZ98	DA01	0,95	0,94	0,95	0,94	4	0,94		0,01	0,55	104,54
30	A88	PZ98	DA01	0,89	0,93	1,03	0,93	4	0,94		0,06	6,42	104,65
31	F12x	PD01	DB08	0,96	0,94	0,95	0,95	4	0,95		0,01	0,76	105,23
32	F15x	PC01	DB08	0,96	0,96	0,94	0,95	4	0,95		0,01	1,01	105,57
33	F06x	PD02	DB08	0,96	0,96	0,97	0,96	4	0,96		0,01	0,52	106,57
34	A57	PZ02	DD02	0,96	0,97	0,96	0,97	4	0,97		0,01	0,60	106,95
35	A49x	PC03	DB08	0,97	0,97	0,97	0,98	4	0,97		0,01	0,54	107,71
36	F32	PD01	DB08	0,98	0,98	0,98	1,019a	3	0,98		0,00	0,24	108,32
37	F13x	PD01	DB08	0,99	1,021a	0,99	0,99	3	0,99		0,00	0,35	109,83
38	A91	PZ98	DA01	9,40	9,00	9,20	9,40	0	9,25	b *	0,19	2,07	1025,19
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n Mean s_r CV_r
all labs 144 0,90 0,017 1,918

* = non tolerable mean because more than +/-

15 % from the mean

l s_R CV_R
37 0,057 6,303

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: S

Sample: 2

Unit: mg/g

No.	Lab. Code	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery %
		P	D	1	2	3	4				s _i	V _i	
1	F27x	PZ98	DA01	0,75	0,73	0,72	0,61	4	0,70	*	0,07	9,29	80,46
2	A86	PZ98	DA01	0,77	0,78	0,77	0,74	4	0,76		0,02	2,34	87,60
3	A56	PC01	DB08	0,80	0,78	0,76	0,81	4	0,79		0,02	2,76	90,29
4	A36	PD02	DB08	0,84	0,76	0,79	0,77	4	0,79		0,04	4,51	90,58
5	F19x	PD02	DB08	0,76	0,87	0,84	0,74	4	0,80		0,06	7,48	91,87
6	F08x	PZ99	DB08	0,77	0,78	0,83	0,83	4	0,80		0,03	3,83	91,98
7	S22x	PZ98	DA02	0,81	0,82	0,80	0,81	4	0,81		0,01	1,01	92,87
8	A62x	PZ98	DA01	0,76	0,77	0,80	0,91	4	0,81		0,07	8,49	92,87
9	A90	PD99	DB10	0,80	0,80	0,83	0,83	4	0,82		0,02	2,13	93,44
10	A61x	PD01	DB08	0,82	0,80	0,82	0,82	4	0,82		0,01	1,06	93,59
11	F21x	PZ98	DA01	0,81	0,84	0,82	0,86	4	0,83		0,02	2,66	95,45
12	F02x	PZ98	DA01	0,87	0,83	0,84	0,84	4	0,85		0,02	2,05	96,88
13	F24x	PD02	DB99	0,92	0,79	0,80	0,87	4	0,85		0,06	7,26	96,88
14	F05x	PZ98	DA01	0,85	0,87	0,84	0,85	4	0,85		0,01	1,25	97,80
15	F03x	PD02	DB08	0,87	0,85	0,86	0,86	4	0,86		0,01	0,90	98,52
16	F18x	PD99	DB08	0,86	0,86	0,86	0,87	4	0,86		0,01	0,96	98,92
17	A65	PD01	DB08	0,87	0,87	0,86	0,86	4	0,87		0,01	0,67	99,18
18	A45	PB99	DB08	0,87	0,86	0,87	0,86	4	0,87		0,00	0,37	99,26
19	A47x	PD01	DB08	0,88	0,87	0,87	0,85	4	0,87		0,01	1,45	99,46
20	A85x	PZ98	DA01	0,92	0,89	0,85	0,82	4	0,87		0,04	5,05	99,75
21	F28	PZ98	DA01	0,88	0,87	0,87	0,86	4	0,87		0,01	0,62	99,75
22	F25x	PB06	DB08	0,89	0,87	0,88	0,87	4	0,88		0,01	1,11	100,41
23	F15x	PC01	DB08	0,89	0,89	0,90	0,90	4	0,90		0,01	0,65	102,62
24	F06x	PD02	DB08	0,89	0,89	0,90	0,90	4	0,90		0,00	0,41	102,72
25	F12x	PD01	DB08	0,90	0,89	0,91	0,91	4	0,90		0,01	1,07	103,40
26	A82	PD01	DB08	0,89	0,90	0,91	0,92	4	0,90		0,01	1,05	103,62
27	F32	PD01	DB08	0,92	0,93	0,92	0,93	4	0,92		0,01	0,73	105,80
28	A97	PD02	DB10	0,92	0,94	0,93	1,12a	3	0,93		0,01	1,08	106,63
29	A49x	PC03	DB08	0,94	0,93	0,93	0,92	4	0,93		0,01	1,01	106,81
30	F14x	PC01	DB08	0,94	0,94	0,93	0,93	4	0,94		0,01	0,62	107,20
31	F07x	PD03	DB08	0,94	0,93	0,94	0,94	4	0,94		0,00	0,52	107,69
32	F16x	PC01	DB08	0,95	0,95	0,93	0,93	4	0,94		0,01	0,86	107,70
33	A57	PZ02	DD02	0,96	0,96	0,96	0,95	4	0,96		0,01	0,52	109,78
34	A60x	PD01	DB10	0,93	0,95	0,97	0,99	4	0,96		0,03	2,81	110,37
35	A88	PZ98	DA01	0,97	0,99	1,00	0,97	4	0,98		0,02	1,58	112,75
36	F13x	PD01	DB08	0,98	1,00	0,99	0,99	4	0,99		0,01	0,83	112,99
37	F33x	PD01	DB10	0,91	0,95	1,05	1,06	4	0,99		0,07	7,47	113,79
38	A91	PZ98	DA01	8,80	9,00	8,80	9,00	0	8,90	b *	0,12	1,30	1020,42
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n Mean s_r CV_r
all labs 147 0,87 0,020 2,310

* = non tolerable mean because more than +/-

15 % from the mean

l s_R CV_R
37 0,067 7,712

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: S

Sample: 3

Unit: mg/g

No.	Lab. Code	Method code		Replications				n	Lab.mean	Lab.standard dev.		Recovery %	
		P	D	1	2	3	4			s _i	V _i		
1	S22x	PZ98	DA02	0,83	0,82a	0,83	0,83	3	0,83	0,00	0,00	88,36	
2	F27x	PZ98	DA01	0,90	0,84	0,86	0,77	4	0,84	0,05	6,17	89,56	
3	A36	PD02	DB08	0,89	0,82	0,85	0,82	4	0,85	0,03	3,92	89,95	
4	F08x	PZ99	DB08	0,83	0,82	0,88	0,90	4	0,86	0,04	4,41	91,36	
5	A56	PC01	DB08	0,81	0,87	0,88	0,90	4	0,86	0,04	4,52	91,66	
6	F07x	PD03	DB08	0,86	0,86	0,87	0,85	4	0,86	0,01	0,58	91,71	
7	A60x	PD01	DB10	0,90	0,86	0,86	0,85	4	0,87	0,02	2,83	92,49	
8	A86	PZ98	DA01	0,88	0,88	0,89	0,91	4	0,89	0,01	1,55	94,61	
9	F24x	PD02	DB99	0,93	0,88	0,88	0,87	4	0,89	0,03	3,04	94,75	
10	F19x	PD02	DB08	0,90	0,91	0,94	0,82	4	0,89	0,05	5,98	94,80	
11	F02x	PZ98	DA01	0,88	0,93	0,86	0,93	4	0,90	0,04	3,95	95,81	
12	A61x	PD01	DB08	0,92	0,91	0,91	0,91	4	0,91	0,01	0,60	96,79	
13	A82	PD01	DB08	0,94	0,93	0,89	0,88	4	0,91	0,03	2,86	96,88	
14	A90	PD99	DB10	0,91	0,93	0,91	0,91	4	0,92	0,01	1,09	97,41	
15	A47x	PD01	DB08	0,95	0,95	0,93	0,93	4	0,94	0,01	1,23	100,07	
16	A45	PB99	DB08	0,94	0,94	0,95	0,94	4	0,94	0,00	0,28	100,33	
17	A65	PD01	DB08	0,96	0,94	0,95	0,94	4	0,95	0,01	1,01	100,87	
18	F03x	PD02	DB08	0,96	0,97	0,96	0,95	4	0,96	0,01	0,99	102,38	
19	F33x	PD01	DB10	0,97	0,97	0,97	0,94	4	0,96	0,02	1,56	102,46	
20	F18x	PD99	DB08	0,99	0,95	0,94	0,98	4	0,96	0,02	2,26	102,46	
21	F14x	PC01	DB08	0,96	0,96	0,97	0,96	4	0,96	0,01	0,52	102,46	
22	F05x	PZ98	DA01	0,97	0,98	0,97	0,95	4	0,97	0,01	1,22	102,78	
23	A57	PZ02	DD02	0,99	1,00	0,95	0,93	4	0,97	0,03	3,42	103,00	
24	F16x	PC01	DB08	0,96	0,98	0,98	0,95	4	0,97	0,01	1,36	103,23	
25	F28	PZ98	DA01	0,98	0,97	0,98	0,99	4	0,98	0,01	0,87	104,09	
26	A85x	PZ98	DA01	0,98	0,94	0,97	1,04	4	0,98	0,04	4,27	104,59	
27	F25x	PB06	DB08	0,97	0,99	0,98	0,99	4	0,98	0,01	1,16	104,78	
28	F12x	PD01	DB08	0,99	0,98	0,99	0,99	4	0,99	0,01	0,68	105,10	
29	F06x	PD02	DB08	0,99	1,00	1,00	0,98	4	0,99	0,01	1,00	105,55	
30	A49x	PC03	DB08	1,00	0,99	1,00	0,99	4	0,99	0,01	0,73	105,91	
31	A62x	PZ98	DA01	0,99	0,97	1,00	1,02	4	1,00	0,02	2,09	105,92	
32	F21x	PZ98	DA01	0,99	1,02	0,98	1,01	4	1,00	0,02	1,83	106,46	
33	F15x	PC01	DB08	1,01	1,01	1,00	1,00	4	1,01	0,01	0,57	106,99	
34	F32	PD01	DB08	1,02	1,02	1,02	1,01	4	1,02	0,01	0,53	108,45	
35	F13x	PD01	DB08	1,07	1,06	1,06	1,06	4	1,06	0,00	0,44	113,08	
36	A88	PZ98	DA01	1,14	1,12	1,16	1,16	0	1,15	b *	0,02	1,64	121,99
37	A97	PD02	DB10	1,41	1,29	1,51	1,48	0	1,42	b *	0,10	6,87	151,43
38	A91	PZ98	DA01	9,00	9,40	9,60	9,50	0	9,38	b *	0,26	2,81	998,02
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n Mean s_r CV_r
all labs 139 0,94 0,018 1,936

* = non tolerable mean because more than +/-

15 % from the mean

l s_R CV_R
35 0,058 6,224

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: S

Sample: 4

Unit: mg/g

No.	Lab. Code	Method code		Replications				n	Lab.mean	Lab.standard dev.		Recovery %	
		P	D	1	2	3	4			s _i	V _i		
1	F02x	PZ98	DA01	1,98	1,96	2,05	1,95	4	1,99		0,05	2,27	86,43
2	F28	PZ98	DA01	2,09	2,08	2,06	2,11	4	2,09		0,02	1,00	90,78
3	A57	PZ02	DD02	2,07	2,10	2,10	2,10	4	2,09		0,02	0,72	91,11
4	A56	PC01	DB08	2,09	2,12	2,20	1,99	4	2,10		0,09	4,12	91,42
5	A36	PD02	DB08	2,16	2,05	2,14	2,12	4	2,12		0,05	2,26	92,20
6	F08x	PZ99	DB08	2,09	2,04	2,23	2,14	4	2,13		0,08	3,78	92,68
7	A86	PZ98	DA01	2,14	2,15	2,17	2,20	4	2,16		0,03	1,32	94,19
8	A90	PD99	DB10	2,17	2,21	2,21	2,11	4	2,18		0,05	2,17	94,70
9	A62x	PZ98	DA01	2,18	2,27	2,20	2,15	4	2,20		0,05	2,32	95,79
10	F24x	PD02	DB99	2,23	2,21	2,19	2,19	4	2,21		0,02	0,87	96,00
11	F27x	PZ98	DA01	2,47	2,02	2,38	2,04	0	2,23	c	0,23	10,32	96,93
12	A85x	PZ98	DA01	2,39	2,02	2,31	2,25	4	2,24		0,16	7,09	97,64
13	A65	PD01	DB08	2,27	2,22	2,27	2,27	4	2,26		0,02	1,11	98,29
14	F19x	PD02	DB08	2,29	2,26	2,29	2,25	4	2,27		0,02	0,91	98,94
15	F05x	PZ98	DA01	2,28	2,25	2,29	2,29	4	2,28		0,02	0,83	99,16
16	A47x	PD01	DB08	2,32	2,25	2,27	2,29	4	2,28		0,03	1,31	99,38
17	S22x	PZ98	DA02	2,29	2,28	2,28	2,29	4	2,29		0,01	0,25	99,49
18	A49x	PC03	DB08	2,28	2,28	2,30	2,31	4	2,29		0,01	0,53	99,84
19	A45	PB99	DB08	2,29	2,30	2,31	2,30	4	2,30		0,01	0,35	100,14
20	F03x	PD02	DB08	2,27	2,22	2,37	2,35	4	2,30		0,07	3,02	100,16
21	F18x	PD99	DB08	2,30	2,32	2,30	2,32	4	2,31		0,01	0,50	100,58
22	F15x	PC01	DB08	2,34	2,36	2,14	2,41	4	2,31		0,12	5,13	100,69
23	F21x	PZ98	DA01	2,30	2,32	2,34	2,33	4	2,32		0,02	0,68	101,15
24	F25x	PB06	DB08	2,34	2,34	2,31	2,31	4	2,33		0,02	0,74	101,26
25	A61x	PD01	DB08	2,35	2,35	2,32	2,29	4	2,33		0,03	1,25	101,32
26	A82	PD01	DB08	2,32	2,34	2,34	2,33	4	2,33		0,01	0,45	101,63
27	F06x	PD02	DB08	2,39	2,39	2,38	2,37	4	2,38		0,01	0,37	103,56
28	F14x	PC01	DB08	2,40	2,38	2,38	2,38	4	2,39		0,01	0,42	103,84
29	F16x	PC01	DB08	2,37	2,37	2,39	2,42	4	2,39		0,02	0,95	103,84
30	F12x	PD01	DB08	2,38	2,43	2,38	2,36	4	2,39		0,03	1,17	103,90
31	F07x	PD03	DB08	2,42	2,37	2,40	2,42	4	2,40		0,02	0,95	104,66
32	F32	PD01	DB08	2,41	2,41	2,41	2,42	4	2,41		0,01	0,23	104,96
33	F13x	PD01	DB08	2,52	2,52	2,60	2,53	4	2,54		0,04	1,59	110,58
34	A88	PZ98	DA01	2,63	2,61	2,52	2,56	4	2,58		0,05	1,93	112,36
35	A60x	PD01	DB10	2,60	2,57	2,65	2,57	4	2,60		0,04	1,50	113,05
36	F33x	PD01	DB10	2,55	2,52	2,66	2,77	4	2,63		0,11	4,34	114,29
37	A97	PD02	DB10	3,03	3,45	3,21	3,31	0	3,25	b *	0,18	5,43	141,50
38	A91	PZ98	DA01	9,60	10,00	9,90	9,40	0	9,73	b *	0,28	2,83	423,42
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n Mean s_r CV_r
all labs 140 2,30 0,038 1,660

* = non tolerable mean because more than +/-

15 % from the mean

l s_R CV_R
35 0,147 6,404

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: P

Sample: 1

Unit: mg/g

No.	Lab. Code	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery %
		P	D	1	2	3	4				s _i	V _i	
1	A43x	PB06	DE01	0,91	0,94	0,92	0,98	0	0,94	b *	0,03	3,52	41,32
2	A91	PB02	DB08	1,75	1,79	1,85	1,82	0	1,80	b *	0,04	2,36	79,45
3	F07x	PD03	DB08	2,06	2,05	2,08	2,08	4	2,07		0,02	0,78	91,13
4	A88	PD01	DB08	2,03	2,10	2,08	2,08	4	2,07		0,03	1,43	91,34
5	F27x	PD01	DE01	2,13	2,07	2,13	2,08	4	2,10		0,03	1,48	92,54
6	A36	PD02	DB08	2,15	2,06	2,12	2,07	4	2,10		0,04	2,02	92,54
7	A56	PC01	DB08	2,14	2,10	2,16	2,01	4	2,10		0,07	3,24	92,57
8	A57	PZ02	DD02	2,13	2,13	2,11	2,14	4	2,13		0,01	0,59	93,75
9	A97	PD02	DB10	2,12	2,03	2,23	2,15	4	2,13		0,08	3,87	93,97
10	A82	PD01	DB08	2,13	2,14	2,15	2,16	4	2,14		0,01	0,66	94,51
11	F03x	PD02	DB08	2,14	2,15	2,15	2,19	4	2,16		0,02	0,97	95,11
12	F24x	PD02	DB99	2,16	2,16	2,20	2,17	4	2,17		0,02	0,87	95,73
13	A90	PD99	DB10	2,20	2,19	2,24	2,19	4	2,21		0,02	1,08	97,17
14	A45	PE99	DB08	2,22	2,21	2,20	2,22	4	2,21		0,01	0,43	97,50
15	A85x	PC02	DB08	2,27	2,11	2,30	2,22	4	2,22		0,08	3,76	98,00
16	A61x	PB02	DB08	2,23	2,27	2,25	2,25	4	2,25		0,02	0,75	99,25
17	F02x	PD02	DB08	2,73a	2,27	2,26	2,26	3	2,26		0,01	0,26	99,74
18	F16x	PC01	DB08	2,27	2,26	2,26	2,28	4	2,27		0,01	0,32	99,83
19	F15x	PC01	DB08	2,27	2,26	2,27	2,27	4	2,27		0,01	0,22	99,92
20	S22x	PD02	DB10	2,28	2,27	2,26	2,29	4	2,28		0,01	0,57	100,25
21	F26x	PD02	DB09	2,28	2,29	2,31	2,29	4	2,29		0,01	0,55	101,02
22	F05x	PD02	DB08	2,29	2,31	2,30	2,30	4	2,30		0,01	0,35	101,35
23	F33x	PD01	DB10	2,32	2,26	2,31	2,32	4	2,30		0,03	1,25	101,46
24	F21x	PC02	DE01	2,32	2,33	2,28	2,30	4	2,31		0,02	0,96	101,68
25	F01	PD02	DE01	2,40	2,23	2,24	2,36	4	2,31		0,09	3,70	101,68
26	F19x	PD02	DB08	2,44	2,21	2,08	2,54	0	2,32	c	0,21	9,07	102,12
27	A49x	PC03	DB08	2,31	2,33	2,32	2,32	4	2,32		0,01	0,28	102,15
28	F28	PD01	DB08	2,34	2,32	2,33	2,34	4	2,33		0,01	0,40	102,75
29	F12x	PD01	DB08	2,33	2,35	2,34	2,33	4	2,34		0,01	0,36	102,94
30	F18x	PD99	DB08	2,34	2,35	2,32	2,34	4	2,34		0,01	0,54	103,01
31	F25x	PB06	DB08	2,35	2,32	2,34	2,36	4	2,34		0,02	0,77	103,17
32	A47x	PD01	DB08	2,33	2,34	2,34	2,36	4	2,34		0,01	0,54	103,23
33	F08x	PE99	DB08	2,38	2,34	2,36	2,39	4	2,36		0,02	0,97	104,15
34	A65	PD01	DB08	2,34	2,36	2,36	2,41	4	2,37		0,03	1,26	104,33
35	A60x	PD01	DB10	2,38	2,36	2,37	2,36	4	2,37		0,01	0,53	104,36
36	F13x	PD01	DB08	2,40	2,38	2,37	2,35	4	2,38		0,02	0,86	104,66
37	F14x	PC01	DB08	2,42	2,43	2,41	2,41	4	2,42		0,01	0,40	106,53
38	A62x	PD02	DE01	2,49	2,42	2,56	2,35	4	2,46		0,09	3,68	108,18
39	F32	PD01	DB08	2,51	2,51	2,51	2,6a	3	2,51	*	0,00	0,00	110,39
40	F06x	PD02	DB08	2,50	2,52	2,50	2,52	4	2,51	*	0,01	0,54	110,64
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n Mean s_r CV_r
all labs 146 2,27 0,025 1,102

* = non tolerable mean because more than +/-

10 % from the mean

l s_R CV_R
37 0,117 5,147

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: P

Sample: 2

Unit: mg/g

No.	Lab. Code	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery %
		P	D	1	2	3	4				s _i	V _i	
1	A43x	PB06	DE01	0,47	0,41	0,41	0,45	0	0,43	b *	0,03	7,18	49,97
2	A91	PB02	DB08	0,68	0,71	0,70	0,71	4	0,70	*	0,01	1,88	81,07
3	A88	PD01	DB08	0,75	0,76	0,77	0,78	4	0,76	*	0,01	1,55	88,40
4	F27x	PD01	DE01	0,76	0,77	0,80	0,80	4	0,78		0,02	2,52	90,99
5	A36	PD02	DB08	0,83	0,77	0,79	0,76	4	0,79		0,03	3,93	91,36
6	A56	PC01	DB08	0,81	0,75	0,77	0,83	4	0,79		0,04	4,67	91,62
7	F07x	PD03	DB08	0,80	0,81	0,81	0,81	4	0,80		0,01	0,64	93,29
8	S22x	PD02	DB10	0,81	0,83	0,80	0,80	4	0,81		0,01	1,75	93,97
9	A45	PE99	DB08	0,81	0,81	0,81	0,81	4	0,81		0,00	0,16	94,03
10	A82	PD01	DB08	0,82	0,82	0,82	0,81	4	0,82		0,01	0,75	94,63
11	F24x	PD02	DB99	0,81	0,82	0,82	0,82	4	0,82		0,00	0,61	94,84
12	A90	PD99	DB10	0,81	0,83	0,83	0,83	4	0,83		0,01	1,21	95,71
13	F16x	PC01	DB08	0,84	0,83	0,83	0,83	4	0,84		0,00	0,44	96,88
14	F01	PD02	DE01	0,83	0,83	0,85	0,85	4	0,84		0,01	1,37	97,45
15	A61x	PB02	DB08	0,86	0,85	0,84	0,84	4	0,85		0,01	1,08	98,44
16	F15x	PC01	DB08	0,85	0,85	0,87	0,85	4	0,86		0,01	1,17	99,19
17	F02x	PD02	DB08	0,85	0,88	0,84	0,87	4	0,86		0,02	2,12	99,77
18	A85x	PC02	DB08	0,86	0,89	0,82	0,88	4	0,86		0,03	3,52	100,21
19	F19x	PD02	DB08	0,81	0,94	0,91	0,80	0	0,87	c	0,07	8,27	100,35
20	A49x	PC03	DB08	0,88	0,87	0,87	0,87	4	0,87		0,00	0,35	101,24
21	F26x	PD02	DB09	0,87	0,88	0,87	0,88	4	0,88		0,01	0,66	101,51
22	F08x	PE99	DB08	0,86	0,87	0,88	0,89	4	0,88		0,01	1,53	101,80
23	A47x	PD01	DB08	0,88	0,88	0,87	0,88	4	0,88		0,01	0,57	101,80
24	F18x	PD99	DB08	0,89	0,88	0,88	0,89	4	0,88		0,00	0,45	102,30
25	F12x	PD01	DB08	0,88	0,88	0,88	0,89	4	0,88		0,01	0,64	102,58
26	F05x	PD02	DB08	0,88	0,89	0,89	0,88	4	0,88		0,01	0,59	102,62
27	A65	PD01	DB08	0,90	0,89	0,88	0,88	4	0,89		0,01	1,08	102,96
28	F25x	PB06	DB08	0,89	0,89	0,89	0,89	4	0,89		0,00	0,30	103,20
29	A60x	PD01	DB10	0,87	0,89	0,92	0,88	4	0,89		0,02	2,14	103,29
30	F21x	PC02	DE01	0,90	0,89	0,91	0,90	4	0,90		0,01	0,91	104,41
31	F03x	PD02	DB08	0,91	0,91	0,92	0,93	4	0,92		0,01	1,10	106,30
32	A97	PD02	DB10	0,91	0,91	0,97	0,92	4	0,93		0,03	3,10	107,61
33	F06x	PD01	DB08	0,92	0,92	0,94	0,93	4	0,93		0,01	1,29	107,74
34	F13x	PD01	DB08	0,92	0,93	0,96	0,92	4	0,93		0,02	1,95	107,92
35	F32	PD01	DB08	0,93	0,93	0,93	0,94	4	0,93		0,00	0,54	107,92
36	F33x	PD01	DB10	0,92	0,93	0,96	0,93	4	0,94		0,02	1,85	108,48
37	F28	PD02	DB08	0,96	0,96	0,95	0,94	4	0,95	*	0,01	1,03	110,45
38	A57	PZ02	DD02	0,99	0,98	0,99	0,97	4	0,98	*	0,01	0,97	113,99
39	A62x	PD02	DE01	1,00	1,11	1,11	1,00	0	1,06	b *	0,06	6,02	122,40
40	F14x	PC01	DB08	2,42	2,42	2,41	2,41	0	2,42	b *	0,01	0,24	280,18
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n Mean s_r CV_r
all labs **144** **0,86** **0,012** **1,384**

* = non tolerable mean because more than +/-

10 % from the mean

l s_R CV_R
36 **0,059** **6,902**

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: P

Sample: 3

Unit: mg/g

No.	Lab. Code	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery %
		P	D	1	2	3	4				s _i	V _i	
1	A43x	PB06	DE01	1,12	1,04	1,07	1,17	0	1,10	b *	0,06	5,05	44,53
2	F07x	PD03	DB08	2,19	2,16	2,17	2,17	4	2,17	*	0,01	0,54	88,04
3	F27x	PD01	DE01	2,17	2,21	2,14	2,21	4	2,19	*	0,03	1,50	88,67
4	A56	PC01	DB08	2,12	2,30	2,32	2,35	4	2,27		0,10	4,58	92,24
5	A36	PD02	DB08	2,36	2,35	2,19	2,25	4	2,29		0,08	3,58	92,81
6	A57	PZ02	DD02	2,34	2,37	2,28	2,23	4	2,31		0,06	2,71	93,52
7	F24x	PD02	DB99	2,35	2,32	2,29	2,30	4	2,32		0,03	1,14	93,93
8	F03x	PD02	DB08	2,30	2,33	2,33	2,32	4	2,32		0,01	0,54	94,05
9	A61x	PB02	DB08	2,33	2,33	2,33	2,31	4	2,33		0,01	0,48	94,45
10	A82	PD01	DB08	2,37	2,32	2,31	2,33	4	2,33		0,02	1,06	94,65
11	A90	PD99	DB10	2,32	2,38	2,35	2,35	4	2,35		0,02	1,04	95,35
12	A88	PD01	DB08	2,22	2,18	2,59	2,44	0	2,35	c	0,19	8,11	95,52
13	A85x	PC02	DB08	2,14	2,54	2,42	2,39	0	2,37	c	0,17	7,11	96,29
14	A45	PE99	DB08	2,38	2,39	2,37	2,36	4	2,38		0,01	0,54	96,36
15	F21x	PC02	DE01	2,40	2,45	2,41	2,39	4	2,41		0,03	1,09	97,89
16	S22x	PD02	DB10	2,43	2,42	2,42	2,45	4	2,43		0,01	0,58	98,60
17	F26x	PD02	DB09	2,44	2,43	2,43	2,46	4	2,44		0,01	0,58	99,00
18	F01	PD02	DE01	2,45	2,40	2,52	2,42	4	2,45		0,05	2,15	99,31
19	F16x	PC01	DB08	2,44	2,48	2,43	2,48	4	2,46		0,03	1,11	99,67
20	A49x	PC03	DB08	2,47	2,45	2,47	2,48	4	2,47		0,01	0,49	100,23
21	F05x	PD02	DB08	2,48	2,46	2,48	2,48	4	2,48		0,01	0,40	100,42
22	F02x	PD02	DB08	2,51	2,49	2,48	2,45	4	2,48		0,02	1,01	100,73
23	A47x	PD01	DB08	2,49	2,49	2,48	2,48	4	2,49		0,01	0,23	100,83
24	F19x	PD02	DB08	2,51	2,49	2,65	2,30	4	2,49		0,14	5,78	100,93
25	F18x	PD99	DB08	2,49	2,50	2,48	2,49	4	2,49		0,01	0,33	101,03
26	F28	PD02	DB08	2,48	2,49	2,50	2,50	4	2,49		0,01	0,34	101,08
27	A60x	PD01	DB10	2,48	2,51	2,49	2,50	4	2,49		0,01	0,51	101,22
28	F15x	PC01	DB08	2,49	2,53	2,48	2,49	4	2,50		0,02	0,89	101,33
29	F12x	PD01	DB08	2,53	2,52	2,51	2,50	4	2,52		0,01	0,50	102,13
30	A65	PD01	DB08	2,56	2,53	2,57	2,53	4	2,55		0,02	0,81	103,36
31	F13x	PD01	DB08	2,50	2,58	2,57	2,57	4	2,56		0,04	1,42	103,79
32	F08x	PE99	DB08	2,59	2,58	2,55	2,58	4	2,58		0,02	0,70	104,48
33	F25x	PB06	DB08	2,63	2,60	2,56	2,54	4	2,58		0,04	1,56	104,82
34	A91	PB02	DB08	2,57	2,62	2,60	2,61	4	2,60		0,02	0,83	105,49
35	F33x	PD01	DB10	2,54	2,59	2,66	2,64	4	2,61		0,05	2,06	105,80
36	F14x	PC01	DB08	2,62	2,62	2,61	2,64	4	2,62		0,01	0,48	106,41
37	A97	PD02	DB10	2,73	2,62	2,59	2,63	4	2,64		0,06	2,30	107,22
38	F32	PD01	DB08	2,72	2,71	2,69	2,66	4	2,69		0,02	0,87	109,27
39	F06x	PD02	DB08	2,76	2,68	2,70	2,72	4	2,71	*	0,03	1,21	110,04
40	A62x	PD02	DE01	2,66	2,70	2,73	2,84	4	2,73	*	0,08	2,82	110,87
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n Mean s_r CV_r
all labs **148** **2,46** **0,032** **1,313**

* = non tolerable mean because more than +/-

10 % from the mean

l s_R CV_R
37 **0,139** **5,635**

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: P

Sample: 4

Unit: mg/g

No.	Lab. Code	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery %
		P	D	1	2	3	4				s _i	V _i	
1	A43x	PB06	DE01	0,33	0,30	0,36	0,32	0	0,33	b *	0,02	7,67	49,19
2	A45	PE99	DB08	0,59	0,60	0,60	0,60	4	0,60	*	0,00	0,29	89,86
3	A56	PC01	DB08	0,60	0,60	0,62	0,58	4	0,60		0,02	2,73	90,77
4	S22x	PD02	DB10	0,60	0,61	0,61	0,59	4	0,60		0,01	1,59	90,92
5	A36	PD02	DB08	0,62	0,59	0,61	0,60	4	0,61		0,01	2,13	91,29
6	F26x	PD02	DB09	0,60	0,61	0,62	0,62	4	0,61		0,01	1,56	92,43
7	F01	PD02	DE01	0,63	0,57	0,65	0,63	4	0,62		0,03	5,59	93,56
8	A61x	PB02	DB08	0,61	0,61	0,64	0,64	4	0,63		0,02	2,78	94,54
9	A82	PD01	DB08	0,62	0,63	0,63	0,63	4	0,63		0,00	0,61	94,73
10	F07x	PD03	DB08	0,62	0,62	0,64	0,64	4	0,63		0,01	1,70	94,84
11	F27x	PD01	DE01	0,63	0,64	0,64	0,61	4	0,63		0,01	1,75	95,03
12	F24x	PD02	DB99	0,65	0,62	0,63	0,62	4	0,63		0,01	2,24	95,07
13	A90	PD99	DB10	0,63	0,64	0,64	0,62	4	0,63		0,01	1,51	95,44
14	F25x	PB06	DB08	0,66	0,64	0,65	0,65	4	0,65		0,01	0,83	98,20
15	F15x	PC01	DB08	0,64	0,66	0,65	0,66	4	0,65		0,01	1,47	98,46
16	A85x	PC02	DB08	0,64	0,67	0,67	0,64	4	0,65		0,02	2,73	98,57
17	A47x	PD01	DB08	0,65	0,66	0,65	0,66	4	0,66		0,01	0,88	98,84
18	F08x	PE99	DB08	0,66	0,65	0,67	0,66	4	0,66		0,01	0,84	99,52
19	A88	PD01	DB08	0,70	0,60	0,67	0,67	4	0,66		0,04	6,20	99,57
20	A65	PD01	DB08	0,67	0,65	0,66	0,66	4	0,66		0,01	1,24	99,59
21	F05x	PD02	DB08	0,66	0,66	0,66	0,66	4	0,66		0,00	0,09	99,67
22	F16x	PC01	DB08	0,66	0,66	0,66	0,68	4	0,67		0,01	1,34	100,36
23	A49x	PC03	DB08	0,67	0,67	0,66	0,68	4	0,67		0,01	0,92	100,65
24	A60x	PD01	DB10	0,65	0,67	0,66	0,69	4	0,67		0,02	2,58	100,72
25	F12x	PD01	DB08	0,68	0,68	0,67	0,66	4	0,67		0,01	1,33	101,52
26	F03x	PD02	DB08	0,67	0,67	0,67	0,68	4	0,67		0,01	1,08	101,59
27	F32	PD01	DB08	0,68	0,67	0,68	0,68	4	0,68		0,00	0,64	102,23
28	F18x	PD99	DB08	0,68	0,67	0,68	0,69	4	0,68		0,01	1,15	102,50
29	F14x	PC01	DB08	0,68	0,68	0,68	0,68	4	0,68		0,00	0,00	102,61
30	F02x	PD02	DB08	0,70	0,66	0,73	0,66	4	0,69		0,03	4,95	103,74
31	A91	PB02	DB08	0,68	0,70	0,67	0,72	4	0,69		0,02	3,38	104,42
32	A97	PD02	DB10	0,64	0,72	0,73	0,70	4	0,70		0,04	5,78	105,25
33	F13x	PD01	DB08	0,71	0,71	0,70	0,70	4	0,71		0,01	1,19	106,38
34	F21x	PC02	DE01	0,71	0,72	0,69	0,70	4	0,71		0,01	1,83	106,38
35	F19x	PD02	DB08	0,72	0,72	0,72	0,69	4	0,71		0,01	2,00	107,78
36	F06x	PD02	DB08	0,72	0,72	0,71	0,72	4	0,72		0,00	0,47	108,41
37	A57	PZ02	DD02	0,72	0,77a	0,73	0,73	3	0,73		0,01	0,79	109,65
38	F33x	PD01	DB10	0,72	0,72	0,75	0,78	4	0,74	*	0,03	3,87	112,04
39	F28	PD02	DB08	0,77	0,77	0,76	0,76	4	0,76	*	0,00	0,28	115,29
40	A62x	PD02	DE01	0,86	0,90	0,86	0,90	0	0,88	b *	0,02	2,62	132,79
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n Mean s_r CV_r
all labs 151 0,66 0,013 1,903

* = non tolerable mean because more than +/- 10 % from the mean

l s_R CV_R
38 0,040 6,100

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: Ca

Sample: 1

Unit: mg/g

No.	Lab. Code	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery %
		P	D	1	2	3	4				s _i	V _i	
1	A62x	PD02	DB01	3,26	3,20	3,35	3,19	0	3,25	b *	0,07	2,26	59,27
2	A91	PB04	DB08	3,35	3,77	3,27	3,75	0	3,53	b *	0,26	7,40	64,43
3	F27x	PD01	DB01	5,04	4,87	4,82	4,53	4	4,82	*	0,21	4,37	87,84
4	F19x	PD02	DB08	5,12	4,73	4,31	5,12	4	4,82	c *	0,39	8,02	87,90
5	A42	PB04	DB01	4,88	4,86	4,94	4,96	4	4,91	*	0,05	0,97	89,54
6	A56	PC01	DB08	5,33	4,82	5,34	4,69	0	5,04	c	0,34	6,77	91,95
7	S22x	PD02	DB10	5,05	5,03	5,05	5,06	4	5,05		0,01	0,25	92,05
8	F26x	PD02	DB09	5,10	5,08	5,09	5,06	4	5,08		0,02	0,34	92,69
9	A36	PD02	DB08	5,21	5,10	5,15	5,06	4	5,13		0,06	1,26	93,55
10	A60x	PD01	DB10	5,38	5,16	5,25	5,25	4	5,26		0,09	1,76	95,93
11	A90	PD99	DB10	5,23	5,27	5,35	5,26	4	5,28		0,05	0,97	96,24
12	A65	PD01	DB08	5,35	5,30	5,25	5,25	4	5,29		0,05	0,91	96,43
13	F25x	PB06	DB08	5,25	5,27	5,26	5,38	4	5,29		0,06	1,08	96,49
14	F33x	PD01	DB10	5,39	5,25	5,36	5,24	4	5,31		0,08	1,43	96,84
15	F03x	PD02	DB08	5,52	5,37	5,33	5,19	4	5,35		0,14	2,56	97,57
16	A49x	PC03	DB08	5,36	5,41	5,40	5,42	4	5,40		0,03	0,52	98,40
17	A45x	PB99	DB08	5,41	5,45	5,46	5,47	4	5,45		0,03	0,48	99,34
18	F05x	PD02	DB08	5,44	5,47	5,45	5,44	4	5,45		0,01	0,26	99,39
19	A61x	PB02	DB08	5,44	5,47	5,42	5,47	4	5,45		0,02	0,45	99,39
20	F02x	PD02	DB08	5,87	5,36	5,36	5,27	4	5,47		0,27	5,00	99,66
21	F28	PD02	DB08	5,48	5,46	5,51	5,46	4	5,48		0,03	0,50	99,88
22	F15x	PC01	DB08	5,30	5,35	5,34	5,94	4	5,48		0,31	5,58	99,98
23	A85x	PC02	DB08	5,59	5,57	5,40	5,38	4	5,49		0,11	2,04	100,05
24	F21x	PC02	DB09	5,49	5,52	5,46	5,48	4	5,49		0,02	0,46	100,07
25	F16x	PC01	DB08	5,51	5,50	5,48	5,48	4	5,49		0,02	0,28	100,14
26	F08x	PE99	DB08	5,53	5,49	5,52	5,45	4	5,50		0,03	0,61	100,23
27	A47x	PD01	DB08	5,49	5,50	5,54	5,53	4	5,52		0,02	0,43	100,57
28	F32	PD01	DB08	5,38	5,51	5,56	5,73	4	5,54		0,14	2,60	101,11
29	F14x	PC01	DB08	5,59	5,57	5,55	5,54	4	5,56		0,02	0,40	101,44
30	F24x	PD02	DB99	5,78	5,47	5,60	5,62	4	5,62		0,13	2,26	102,44
31	F01	PD02	DB01	5,66	5,79	5,50	5,55	4	5,63		0,13	2,29	102,58
32	F07x	PD03	DB08	5,65	5,73	5,56	5,65	4	5,65		0,07	1,18	103,00
33	A82	PD01	DB08	5,61	5,64	5,70	5,68	4	5,66		0,04	0,77	103,16
34	F13x	PD01	DB08	5,68	5,84	5,51	5,62	4	5,66		0,14	2,42	103,23
35	F12x	PD01	DB08	5,70	5,63	5,66	5,70	4	5,67		0,03	0,59	103,41
36	F06x	PD02	DB08	5,72	5,71	5,64	5,64	4	5,68		0,04	0,77	103,52
37	F18x	PD99	DB08	5,92	5,96	5,97	5,97	4	5,96		0,02	0,40	108,60
38	A57	PZ02	DD02	6,00	6,02	6,05	6,06	4	6,03	*	0,03	0,46	110,01
39	A43x	PB06	DB01	6,27	6,27	6,17	5,96	4	6,17	*	0,15	2,37	112,47
40	A88	PD01	DB08	6,12	6,25	6,31	6,06	4	6,18	*	0,11	1,82	112,76
41	A97	PD02	DB10	8,14	8,14	8,99 α	8,24	0	8,17	b *	0,06	0,71	149,05
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n Mean s_r CV_r
all labs **144** **5,48** **0,077** **1,408**

* = non tolerable mean because more than +/-

10 % from the mean

l s_R CV_R
36 **0,301** **5,486**

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: Ca

Sample: 2

Unit: mg/g

No.	Lab. Code	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery %
		P	D	1	2	3	4				s _i	V _i	
1	A91	PB04	DB08	10,00	10,35	10,10	10,40	4	10,21	*	0,19	1,89	84,99
2	F19x	PD02	DB08	10,00	11,20	10,90	9,50	0	10,40	c *	0,79	7,57	86,55
3	A62x	PD02	DB01	10,77	9,95	10,75	10,31	4	10,45	*	0,39	3,76	86,92
4	A42	PB04	DB01	10,90	10,62	10,40	10,56	4	10,62	*	0,21	1,96	88,38
5	A56	PC01	DB08	11,27	10,56	10,98	11,50	4	11,08		0,41	3,66	92,18
6	A36	PD02	DB08	11,82	10,97	11,15	11,43	4	11,34		0,37	3,27	94,39
7	A60x	PD01	DB10	10,95	11,47	11,62	11,43	4	11,37		0,29	2,56	94,59
8	S22x	PD02	DB10	11,49	11,52	11,48	11,50	4	11,50		0,02	0,15	95,68
9	A90	PD99	DB10	11,41	11,45	11,61	11,67	4	11,54		0,12	1,08	95,99
10	F25x	PB06	DB08	11,63	11,71	11,45	11,86	4	11,66		0,17	1,46	97,05
11	A65	PD01	DB08	11,90	11,71	11,44	11,80	4	11,71		0,20	1,69	97,47
12	F27x	PD01	DB01	11,79	11,73	11,94	11,56	4	11,76		0,16	1,34	97,82
13	F03x	PD02	DB08	12,21	11,98	11,44	11,62	4	11,81		0,35	2,97	98,30
14	A85x	PC02	DB08	11,96	11,75	11,67	11,90	4	11,82		0,14	1,14	98,34
15	F02x	PD02	DB08	11,80	12,30	11,30	12,00	4	11,85		0,42	3,55	98,61
16	F21x	PC02	DB09	11,85	11,88	11,89	11,84	4	11,87		0,02	0,20	98,74
17	A47x	PD01	DB08	11,87	11,92	11,93	11,95	4	11,92		0,03	0,29	99,17
18	A49x	PC03	DB08	11,88	12,09	11,82	11,97	4	11,94		0,12	0,97	99,34
19	F15x	PC01	DB08	12,11	11,98	11,79	12,06	4	11,99		0,14	1,17	99,74
20	F05x	PD02	DB08	12,07	11,97	11,94	11,97	4	11,99		0,06	0,47	99,76
21	F33x	PD01	DB10	11,87	11,89	12,16	12,20	4	12,03		0,17	1,45	100,11
22	F16x	PC01	DB08	12,02	12,00	12,20	12,07	4	12,07		0,09	0,75	100,46
23	A61x	PB02	DB08	11,97	12,18	12,13	12,15	4	12,11		0,09	0,78	100,76
24	F01	PD02	DB01	12,31	12,11	12,18	12,12	4	12,18		0,09	0,76	101,36
25	A43x	PB06	DB01	12,23	12,23	12,23	12,23	4	12,23		0,00	0,00	101,77
26	F26x	PD02	DB09	12,36	12,34	12,35	12,32	4	12,34		0,02	0,14	102,71
27	A45x	PB99	DB08	12,50	12,30	12,20	12,50	4	12,38		0,15	1,21	102,98
28	F24x	PD02	DB99	12,00	12,38	12,78	12,39	4	12,39		0,32	2,57	103,09
29	F06x	PD02	DB08	12,30	12,23	12,60	12,45	4	12,40		0,16	1,33	103,15
30	A57	PZ02	DD02	12,46	12,52	12,41	12,33	4	12,43		0,08	0,65	103,44
31	F28	PD02	DB08	12,63	12,66	12,13	12,45	4	12,47		0,24	1,95	103,75
32	F32	PD01	DB08	12,71	12,71	12,29	12,39	4	12,53		0,22	1,74	104,24
33	F08x	PE99	DB08	12,53	12,66	12,45	12,49	4	12,53		0,09	0,73	104,29
34	F13x	PD01	DB08	12,68	12,63	12,64	12,29	4	12,56		0,18	1,44	104,50
35	F14x	PC01	DB08	12,49	12,60	12,59	12,57	4	12,56		0,05	0,40	104,54
36	F07x	PD03	DB08	12,59	12,64	12,32	12,74	4	12,57		0,18	1,43	104,63
37	A82	PD01	DB08	12,65	12,61	12,67	12,60	4	12,63		0,03	0,26	105,12
38	F12x	PD01	DB08	12,68	12,64	12,93	12,86	4	12,78		0,14	1,09	106,33
39	A97	PD02	DB10	13,08	13,94	12,78	12,32	0	13,03	c	0,68	5,24	108,43
40	A88	PD01	DB08	13,25	13,21	13,59	13,15	4	13,30	*	0,20	1,47	110,67
41	F18x	PD99	DB08	13,70	13,80	13,90	13,70	4	13,78	*	0,10	0,70	114,63
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n Mean s_r CV_r
all labs 156 12,02 0,164 1,368

* = non tolerable mean because more than +/-

10 % from the mean

l s_R CV_R
39 0,697 5,801

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: Ca

Sample: 3

Unit: mg/g

No.	Lab. Code	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery %
		P	D	1	2	3	4				s _i	V _i	
1	A62x	PD02	DB01	0,77	0,83	0,81	0,71	0	0,78	b *	0,05	6,78	25,59
2	A42	PB04	DB01	2,58	2,42	2,28	2,34	4	2,41	*	0,13	5,41	78,90
3	F27x	PD01	DB01	2,53	2,59	2,26	2,31	4	2,42	*	0,16	6,71	79,40
4	F19x	PD02	DB08	2,60	2,59	2,71	2,33	4	2,56	*	0,16	6,30	83,90
5	F26x	PD02	DB09	2,73	2,75	2,74	2,74	4	2,74	*	0,01	0,30	89,89
6	A56	PC01	DB08	2,60	2,85	2,86	2,91	4	2,80		0,14	4,88	91,96
7	S22x	PD02	DB10	2,81	2,79	2,82	2,80	4	2,81		0,01	0,46	92,02
8	A61x	PB02	DB08	2,84	2,83	2,85	2,86	4	2,85		0,01	0,45	93,34
9	A36	PD02	DB08	2,96	2,84	2,86	2,77	4	2,86		0,08	2,75	93,75
10	A65	PD01	DB08	2,89	2,82	2,87	2,86	4	2,86		0,03	1,03	93,83
11	F32	PD01	DB08	2,81	2,85	2,99	2,87	4	2,88		0,08	2,69	94,51
12	A60x	PD01	DB10	2,92	2,92	2,92	2,93	4	2,92		0,01	0,23	95,90
13	A90	PD99	DB10	2,96	2,96	2,94	2,95	4	2,95		0,01	0,32	96,86
14	F03x	PD02	DB08	3,03	3,01	2,92	2,90	4	2,97		0,06	2,16	97,33
15	A47x	PD01	DB08	3,03	2,95	3,04	2,98	4	3,00		0,04	1,41	98,42
16	A49x	PC03	DB08	3,01	2,97	3,02	3,00	4	3,00		0,02	0,73	98,49
17	A45x	PB99	DB08	3,02	3,01	3,00	3,02	4	3,01		0,01	0,32	98,83
18	F02x	PD02	DB08	3,01	3,03	3,04	3,02	4	3,03		0,01	0,43	99,24
19	F05x	PD02	DB08	3,08	3,09	3,07	3,09	4	3,08		0,01	0,31	101,13
20	F15x	PC01	DB08	3,33	3,06	2,98	2,98	4	3,09		0,17	5,38	101,29
21	F25x	PB06	DB08	3,09	3,09	3,08	3,10	4	3,09		0,01	0,27	101,31
22	F08x	PE99	DB08	3,09	3,05	3,11	3,11	4	3,09		0,03	0,92	101,37
23	F33x	PD01	DB10	3,07	3,13	3,12	3,05	4	3,09		0,04	1,25	101,46
24	F16x	PC01	DB08	3,04	3,14	3,11	3,13	4	3,10		0,05	1,46	101,84
25	F21x	PC02	DB09	3,11	3,12	3,08	3,15	4	3,12		0,03	0,93	102,19
26	A85x	PC02	DB08	3,08	3,16	3,20	3,11	4	3,14		0,05	1,66	102,91
27	F14x	PC01	DB08	3,13	3,14	3,12	3,16	4	3,14		0,02	0,54	102,93
28	F06x	PD02	DB08	3,14	3,15	3,18	3,15	4	3,15		0,02	0,50	103,49
29	F07x	PD03	DB08	3,19	3,15	3,15	3,14	4	3,16		0,02	0,74	103,53
30	A82	PD01	DB08	3,25	3,27	3,09	3,12	4	3,19		0,09	2,80	104,49
31	F28	PD02	DB08	3,18	3,16	3,23	3,19	4	3,19		0,03	0,91	104,64
32	F24x	PD02	DB99	3,35	3,13	3,20	3,12	4	3,20		0,11	3,32	104,98
33	A97	PD02	DB10	3,22	3,23	3,23	3,7a	3	3,23		0,01	0,18	105,86
34	F12x	PD01	DB08	3,21	3,24	3,25	3,24	4	3,23		0,02	0,55	106,07
35	F13x	PD01	DB08	3,26	3,28	3,23	3,27	4	3,26		0,02	0,73	106,93
36	F01	PD02	DB01	3,31	3,32	3,22	3,26	4	3,28		0,05	1,42	107,53
37	A57	PZ02	DD02	3,44	3,49	3,41	3,44	4	3,45	*	0,03	0,96	113,02
38	F18x	PD99	DB08	3,49	3,50	3,45	3,39	4	3,46	*	0,05	1,44	113,43
39	A91	PB04	DB08	3,68	3,57	3,19	3,58	4	3,51	*	0,21	6,13	115,07
40	A88	PD01	DB08	3,57	3,43	3,85	3,72	4	3,64	*	0,18	4,99	119,38
41	A43x	PB06	DB01	3,87	3,97	3,87	3,97	0	3,92	b *	0,06	1,47	128,60
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n Mean s_r CV_r
all labs 155 3,05 0,057 1,857

* = non tolerable mean because more than +/-

10 % from the mean

l s_R CV_R
39 0,262 8,588

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: Ca

Sample: 4

Unit: mg/g

No.	Lab. Code	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery %
		P	D	1	2	3	4				s _i	V _i	
1	A62x	PD02	DB01	5,23	5,67	5,75	5,89	0	5,64	b *	0,28	5,06	23,89
2	A91	PB04	DB08	20,50	20,69	20,75	20,65	4	20,65	*	0,11	0,51	87,54
3	A42	PB04	DB01	20,34	23,00	20,82	20,60	0	21,19	c *	1,22	5,77	89,84
4	A57	PZ02	DD02	21,00	21,35	21,43	21,37	4	21,29		0,19	0,91	90,26
5	F01	PD02	DB01	21,53	21,93	21,58	21,69	4	21,68		0,18	0,82	91,93
6	F19x	PD02	DB08	22,10	21,60	22,20	21,30	4	21,80		0,42	1,95	92,43
7	A65	PD01	DB08	22,83	21,91	21,39	21,40	4	21,88		0,68	3,09	92,78
8	A56	PC01	DB08	21,92	22,29	22,56	21,02	4	21,94		0,67	3,06	93,04
9	A61x	PB02	DB08	22,01	22,56	22,51	22,68	4	22,44		0,30	1,32	95,14
10	A60x	PD01	DB10	22,25	22,47	22,39	22,99	4	22,52		0,32	1,44	95,50
11	A85x	PC02	DB08	22,88	22,76	22,38	22,93	4	22,74		0,25	1,10	96,40
12	F26x	PD02	DB09	22,93	22,92	22,83	22,90	4	22,90		0,05	0,20	97,07
13	A36	PD02	DB08	23,23	23,12	22,89	22,41	4	22,91		0,36	1,59	97,15
14	F21x	PC02	DB09	22,99	22,91	23,17	23,10	4	23,04		0,12	0,50	97,70
15	S22x	PD02	DB10	23,04	23,02	23,05	23,06	4	23,04		0,02	0,07	97,70
16	F27x	PD01	DB01	22,85	23,20	23,21	23,52	4	23,20		0,27	1,18	98,35
17	A90	PD99	DB10	23,12	23,79	23,52	22,58	4	23,25		0,53	2,26	98,59
18	F25x	PB06	DB08	23,18	23,38	23,37	23,09	4	23,26		0,14	0,62	98,60
19	A97	PD02	DB10	23,09	23,14	24,16	23,36	4	23,44		0,50	2,12	99,37
20	F03x	PD02	DB08	23,80	23,70	23,22	23,08	4	23,45		0,35	1,50	99,43
21	F05x	PD02	DB08	23,87	23,44	23,76	23,44	4	23,63		0,22	0,94	100,18
22	F14x	PC01	DB08	23,20	23,40	23,90	24,20	4	23,68		0,46	1,93	100,38
23	F15x	PC01	DB08	23,90	23,46	23,82	24,19	4	23,84		0,30	1,26	101,09
24	A49x	PC03	DB08	24,01	24,04	23,90	23,96	4	23,98		0,06	0,25	101,66
25	A47x	PD01	DB08	23,95	23,95	24,02	24,02	4	23,99		0,04	0,17	101,70
26	F02x	PD02	DB08	24,60	23,40	25,20	23,00	4	24,05		1,02	4,26	101,97
27	F24x	PD02	DB99	24,04	24,03	24,46	24,09	4	24,16		0,21	0,85	102,42
28	F16x	PC01	DB08	24,16	24,50	24,08	24,25	4	24,25		0,18	0,75	102,81
29	A45x	PB99	DB08	24,10	24,20	24,30	24,40	4	24,25		0,13	0,53	102,82
30	F07x	PD03	DB08	24,89	24,62	24,44	24,66	4	24,65		0,19	0,75	104,53
31	F06x	PD02	DB08	24,77	24,47	24,62	25,11	4	24,74		0,27	1,11	104,91
32	F08x	PE99	DB08	25,23	25,05	24,55	24,60	4	24,86		0,34	1,35	105,39
33	F28	PD02	DB08	25,11	24,96	25,03	24,95	4	25,01		0,07	0,30	106,05
34	F33x	PD01	DB10	25,08	24,83	25,88	24,97	4	25,19		0,47	1,87	106,80
35	A43x	PB06	DB01	25,62	25,09	25,09	25,09	4	25,22		0,26	1,05	106,94
36	F32	PD01	DB08	25,27	25,38	25,27	25,38	4	25,32		0,06	0,25	107,37
37	F13x	PD01	DB08	25,53	25,22	25,32	25,31	4	25,35		0,13	0,52	107,47
38	A82	PD01	DB08	25,98	25,35	25,27	25,10	4	25,43		0,38	1,51	107,80
39	F12x	PD01	DB08	25,46	25,79	25,79	25,53	4	25,64		0,17	0,67	108,72
40	A88	PD01	DB08	25,46	25,74	27,95	27,99	0	26,79	c *	1,37	5,13	113,57
41	F18x	PD99	DB08	29,00	29,30	29,10	29,20	0	29,15	b *	0,13	0,44	123,60
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n Mean s_r CV_r
all labs **148** **23,59** **0,282** **1,195**

* = non tolerable mean because more than +/- **10** % from the mean

l s_R CV_R
37 **1,273** **5,398**

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: Mg

Sample: 1

Unit: mg/g

No.	Lab. Code	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery %
		P	D	1	2	3	4				s _f	V _i	
1	A62x	PD02	DB01	0,54	0,50	0,52	0,51	0	0,52	b *	0,02	3,30	39,17
2	A91	PB05	DB08	1,00	1,05	1,03	1,01	0	1,02	b *	0,02	2,17	77,39
3	A57	PZ02	DD02	1,08	1,07	1,05	1,06	0	1,07	b *	0,01	1,21	80,60
4	S22x	PD02	DB10	1,17	1,16	1,18	1,17	4	1,17	*	0,01	0,70	88,55
5	F27x	PD01	DB01	1,18	1,16	1,19	1,17	4	1,17	*	0,01	1,11	88,85
6	F26x	PD02	DB09	1,22	1,21	1,22	1,22	4	1,22		0,01	0,41	92,15
7	A60x	PD01	DB10	1,25	1,22	1,24	1,24	4	1,24		0,01	0,98	93,51
8	A36	PD02	DB08	1,27	1,23	1,26	1,23	4	1,25		0,02	1,65	94,42
9	A90	PD99	DB10	1,24	1,28	1,28	1,24	4	1,26		0,02	1,83	95,36
10	A85x	PB05	DB08	1,30	1,27	1,29	1,24	4	1,28		0,03	2,16	96,61
11	F19x	PD02	DB08	1,35	1,24	1,13	1,40	4	1,28		0,12	9,40	96,88
12	F16x	PC01	DB08	1,28	1,31	1,27	1,28	4	1,28		0,02	1,58	97,16
13	A45	PE99	DB08	1,31	1,29	1,28	1,29	4	1,29		0,01	0,97	97,82
14	F03x	PD02	DB08	1,31	1,30	1,30	1,30	4	1,30		0,01	0,47	98,65
15	A61x	PB02	DB08	1,30	1,31	1,30	1,32	4	1,30		0,01	0,68	98,73
16	A56	PC01	DB08	1,34	1,28	1,39	1,24	4	1,31		0,06	4,90	99,11
17	F21x	PC02	DB09	1,30	1,29	1,31	1,34	4	1,31		0,02	1,65	99,15
18	A82	PD01	DB08	1,31	1,31	1,33	1,31	4	1,32		0,01	0,55	99,56
19	F02x	PD02	DB08	1,48a	1,33	1,32	1,30	3	1,32		0,02	1,16	99,65
20	F08x	PE99	DB08	1,32	1,30	1,31	1,36	4	1,32		0,03	2,08	100,04
21	A47x	PD01	DB08	1,33	1,31	1,33	1,32	4	1,32		0,01	0,72	100,09
22	A49x	PC03	DB08	1,33	1,33	1,33	1,31	4	1,32		0,01	0,62	100,22
23	F25x	PB06	DB08	1,34	1,32	1,33	1,33	4	1,33		0,01	0,78	100,51
24	F15x	PC01	DB08	1,33	1,32	1,34	1,34	4	1,33		0,01	0,72	100,85
25	F05x	PD02	DB08	1,33	1,34	1,33	1,34	4	1,34		0,01	0,43	101,04
26	F33x	PD01	DB10	1,37	1,31	1,35	1,32	4	1,34		0,03	2,06	101,23
27	A65	PD01	DB08	1,34	1,34	1,34	1,35	4	1,34		0,00	0,25	101,44
28	F01	PD02	DB01	1,35	1,35	1,32	1,40	4	1,36		0,03	2,45	102,55
29	F14x	PC01	DB08	1,36	1,37	1,36	1,36	4	1,36		0,01	0,37	103,12
30	F07x	PD03	DB08	1,36	1,38	1,36	1,37	4	1,37		0,01	0,68	103,31
31	F28	PD02	DB08	1,36	1,36	1,38	1,39	4	1,37		0,02	1,13	103,76
32	F18x	PD99	DB08	1,38	1,37	1,37	1,37	4	1,37		0,00	0,36	103,88
33	A42	PB04	DB01	1,36	1,37	1,38	1,38	4	1,37		0,01	0,70	103,88
34	F12x	PD01	DB08	1,38	1,37	1,37	1,38	4	1,38		0,00	0,31	104,07
35	F06x	PD02	DB08	1,37	1,38	1,38	1,38	4	1,38		0,01	0,38	104,18
36	A43x	PB06	DB01	1,38	1,38	1,38	1,38	4	1,38		0,00	0,00	104,22
37	A88	PD01	DB08	1,38	1,40	1,39	1,37	4	1,39		0,01	0,88	104,91
38	F32	PD01	DB08	1,41	1,41	1,41	1,448a	3	1,41		0,00	0,00	106,41
39	F13x	PD01	DB08	1,43	1,44	1,44	1,39	4	1,42		0,02	1,57	107,64
40	F24x	PD02	DB99	1,46	1,37	1,45	1,43	4	1,43		0,04	2,82	108,04
41	A97	PD02	DB10	1,58	1,87	1,90	1,79	0	1,79	b *	0,14	8,09	135,10
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n Mean s_f CV_f
all labs 146 1,32 0,018 1,330

* = non tolerable mean because more than +/-

10 % from the mean

l s_R CV_R
37 0,061 4,618

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: Mg

Sample: 2

Unit: mg/g

No.	Lab. Code	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery %
		P	D	1	2	3	4				s _i	V _i	
1	A57	PZ02	DD02	1,49	1,51	1,48	1,48	0	1,49	b *	0,01	0,95	64,73
2	A91	PB05	DB08	1,82	1,88	1,85	1,90	0	1,86	b *	0,03	1,88	80,92
3	A62x	PD02	DB01	2,07	1,81	1,95	1,83	0	1,92	b *	0,12	6,29	83,20
4	F27x	PD01	DB01	2,03	2,01	2,06	2,16	4	2,06	*	0,07	3,27	89,64
5	S22x	PD02	DB10	2,08	2,11	2,07	2,09	4	2,09		0,02	0,82	90,69
6	A42	PB04	DB01	2,03	2,15	2,06	2,20	4	2,11		0,08	3,73	91,67
7	A60x	PD01	DB10	2,037a	2,14	2,12	2,13	3	2,13		0,01	0,33	92,51
8	A43x	PB06	DB01	2,19	2,19	2,19	2,19	4	2,19		0,00	0,00	95,06
9	A90	PD99	DB10	2,17	2,17	2,24	2,25	4	2,21		0,04	1,97	95,91
10	A36	PD02	DB08	2,25	2,29	2,14	2,17	4	2,21		0,07	3,14	96,12
11	A85x	PB05	DB08	2,29	2,17	2,25	2,23	4	2,23		0,05	2,23	97,03
12	F33x	PD01	DB10	2,19	2,19	2,30	2,26	4	2,24		0,05	2,44	97,10
13	F21x	PC02	DB09	2,20	2,28	2,22	2,25	4	2,24		0,03	1,56	97,21
14	F25x	PB06	DB08	2,27	2,27	2,21	2,27	4	2,25		0,03	1,24	97,96
15	F19x	PD02	DB08	2,12	2,48	2,36	2,07	0	2,26	c	0,20	8,64	98,08
16	F26x	PD02	DB09	2,25	2,26	2,28	2,28	4	2,27		0,01	0,66	98,51
17	A56	PC01	DB08	2,28	2,12	2,27	2,42	4	2,27		0,12	5,31	98,71
18	A82	PD01	DB08	2,28	2,28	2,29	2,27	4	2,28		0,01	0,31	98,99
19	F05x	PD02	DB08	2,27	2,29	2,30	2,29	4	2,29		0,01	0,55	99,38
20	F02x	PD02	DB08	2,31	2,37	2,21	2,29	4	2,30		0,07	2,88	99,71
21	F16x	PC01	DB08	2,27	2,28	2,32	2,32	4	2,30		0,03	1,17	99,83
22	A45	PE99	DB08	2,32	2,27	2,31	2,31	4	2,30		0,02	0,96	100,03
23	F03x	PD02	DB08	2,35	2,31	2,29	2,29	4	2,31		0,03	1,13	100,29
24	F07x	PD03	DB08	2,31	2,32	2,29	2,35	4	2,32		0,02	0,97	100,63
25	F08x	PE99	DB08	2,30	2,31	2,33	2,34	4	2,32		0,02	0,83	100,91
26	F18x	PD99	DB08	2,33	2,31	2,34	2,33	4	2,33		0,01	0,54	101,12
27	A47x	PD01	DB08	2,33	2,34	2,33	2,32	4	2,33		0,01	0,35	101,23
28	F06x	PD02	DB08	2,33	2,30	2,36	2,37	4	2,34		0,03	1,38	101,57
29	A49x	PC03	DB08	2,34	2,35	2,34	2,33	4	2,34		0,01	0,26	101,67
30	A65	PD01	DB08	2,41	2,38	2,32	2,33	4	2,36		0,04	1,85	102,55
31	F15x	PC01	DB08	2,35	2,38	2,36	2,36	4	2,36		0,01	0,53	102,64
32	F01	PD02	DB01	2,44	2,37	2,37	2,33	4	2,38		0,05	1,92	103,29
33	A61x	PB02	DB08	2,42	2,39	2,35	2,38	4	2,38		0,03	1,23	103,55
34	A88	PD01	DB08	2,40	2,30	2,44	2,41	4	2,39		0,06	2,53	103,76
35	F28	PD02	DB08	2,37	2,43	2,45	2,34	4	2,40		0,05	2,23	104,23
36	F14x	PC01	DB08	2,40	2,42	2,42	2,43	4	2,42		0,01	0,52	105,03
37	F32	PD01	DB08	2,45	2,46	2,45	2,45	4	2,45		0,01	0,22	106,43
38	F13x	PD01	DB08	2,45	2,51	2,44	2,42	4	2,45		0,04	1,53	106,58
39	F24x	PD02	DB99	2,40	2,48	2,59	2,49	4	2,49		0,08	3,13	108,18
40	F12x	PD01	DB08	2,48	2,47	2,52	2,51	4	2,49		0,02	0,91	108,39
41	A97	PD02	DB10	3,35	3,75	3,74	3,50	0	3,59	b *	0,19	5,43	155,75
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n Mean s_r CV_r
all labs 143 2,30 0,035 1,508

* = non tolerable mean because more than +/-

10 % from the mean

l s_R CV_R
36 0,106 4,587

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: Mg

Sample: 3

Unit: mg/g

No.	Lab. Code	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery %
		P	D	1	2	3	4				s _i	V _i	
1	A62x	PD02	DB01	0,51	0,55	0,62	0,51	0	0,55	b *	0,05	9,48	41,42
2	F27x	PD01	DB01	1,13	1,15	1,13	1,14	4	1,14	*	0,01	0,67	85,96
3	A57	PZ02	DD02	1,16	1,17	1,13	1,12	4	1,15	*	0,02	2,08	86,62
4	S22x	PD02	DB10	1,16	1,15	1,16	1,18	4	1,16	*	0,01	1,08	87,95
5	F03x	PD02	DB08	1,21	1,22	1,21	1,20	4	1,21		0,01	0,58	91,52
6	A60x	PD01	DB10	1,22	1,21	1,24	1,22	4	1,22		0,01	1,13	92,56
7	A61x	PB02	DB08	1,25	1,25	1,25	1,25	4	1,25		0,00	0,25	94,47
8	F19x	PD02	DB08	1,26	1,29	1,33	1,15	4	1,26		0,08	6,14	95,13
9	F26x	PD02	DB09	1,27	1,26	1,27	1,26	4	1,27		0,01	0,46	95,70
10	A42	PB04	DB01	1,18	1,34	1,24	1,30	4	1,27		0,07	5,53	95,70
11	A90	PD99	DB10	1,27	1,27	1,28	1,27	4	1,27		0,01	0,39	96,27
12	A85x	PB05	DB08	1,28	1,31	1,24	1,27	4	1,28		0,03	2,14	96,50
13	A36	PD02	DB08	1,32	1,31	1,26	1,23	4	1,28		0,04	3,31	96,84
14	F21x	PC02	DB09	1,27	1,28	1,29	1,30	4	1,29		0,01	1,00	97,21
15	A91	PB05	DB08	1,27	1,30	1,29	1,31	4	1,29		0,02	1,23	97,59
16	A56	PC01	DB08	1,20	1,32	1,32	1,35	4	1,30		0,07	5,10	98,05
17	A65	PD01	DB08	1,32	1,29	1,31	1,29	4	1,30		0,01	1,12	98,35
18	F16x	PC01	DB08	1,33	1,31	1,32	1,29	4	1,31		0,02	1,18	99,13
19	A49x	PC03	DB08	1,32	1,32	1,33	1,31	4	1,32		0,01	0,64	99,86
20	F08x	PE99	DB08	1,32	1,32	1,32	1,32	4	1,32		0,00	0,11	99,94
21	A45	PE99	DB08	1,33	1,33	1,32	1,32	4	1,33		0,01	0,44	100,24
22	A82	PD01	DB08	1,34	1,31	1,31	1,33	4	1,33		0,02	1,15	100,34
23	A47x	PD01	DB08	1,32	1,33	1,34	1,33	4	1,33		0,01	0,61	100,62
24	F05x	PD02	DB08	1,35	1,35	1,34	1,35	4	1,35		0,01	0,37	101,94
25	F25x	PB06	DB08	1,37	1,35	1,37	1,33	4	1,35		0,02	1,38	102,44
26	F02x	PD02	DB08	1,36	1,36	1,36	1,34	4	1,36		0,01	0,74	102,51
27	F18x	PD99	DB08	1,36	1,36	1,35	1,36	4	1,36		0,01	0,37	102,70
28	A43x	PB06	DB01	1,36	1,36	1,36	1,355	4	1,36		0,00	0,26	102,91
29	F07x	PD03	DB08	1,37	1,37	1,34	1,37	4	1,37		0,02	1,20	103,31
30	F15x	PC01	DB08	1,37	1,37	1,37	1,38	4	1,37		0,00	0,36	103,83
31	F01	PD02	DB01	1,40	1,34	1,36	1,40	4	1,38		0,03	2,18	104,02
32	F06x	PD02	DB08	1,40	1,38	1,38	1,37	4	1,38		0,01	0,75	104,61
33	F12x	PD01	DB08	1,40	1,40	1,37	1,37	4	1,38		0,02	1,10	104,70
34	F14x	PC01	DB08	1,40	1,39	1,39	1,39	4	1,39		0,01	0,36	105,35
35	F24x	PD02	DB99	1,46	1,42	1,42	1,41	4	1,43		0,02	1,55	108,00
36	F28	PD02	DB08	1,40	1,44	1,41	1,46	4	1,43		0,02	1,74	108,00
37	F32	PD01	DB08	1,44	1,43	1,44	1,43	4	1,43		0,01	0,44	108,37
38	F13x	PD01	DB08	1,43	1,42	1,42	1,46	4	1,43		0,02	1,45	108,41
39	F33x	PD01	DB10	1,41	1,41	1,46	1,49	4	1,44		0,04	2,74	109,13
40	A88	PD01	DB08	1,50	1,40	1,59	1,50	4	1,50	*	0,08	5,08	113,22
41	A97	PD02	DB10	2,26	2,57	2,27	2,75	0	2,46	b *	0,24	9,73	186,30
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n Mean s_r CV_r
all labs 156 1,32 0,020 1,500

* = non tolerable mean because more than +/-

10 % from the mean

l s_R CV_R
39 0,082 6,219

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: Mg

Sample: 4

Unit: mg/g

No.	Lab. Code	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery %
		P	D	1	2	3	4				s _i	V _i	
1	A57	PZ02	DD02	2,41	2,43	2,44	2,43	4	2,43	*	0,01	0,52	82,11
2	S22x	PD02	DB10	2,61	2,59	2,60	2,61	4	2,60	*	0,01	0,37	88,03
3	A60x	PD01	DB10	2,66	2,68	2,60	2,70	4	2,66	*	0,04	1,57	89,95
4	A85x	PB05	DB08	2,76	2,73	2,77	2,76	4	2,75		0,02	0,67	93,16
5	A62x	PD02	DB01	2,60	2,73	2,76	2,93	4	2,76		0,14	4,93	93,18
6	A65	PD01	DB08	2,80	2,83	2,71	2,71	4	2,76		0,06	2,23	93,44
7	A36	PD02	DB08	2,86	2,82	2,65	2,77	4	2,78		0,09	3,28	93,86
8	A43x	PB06	DB01	2,87	2,87	2,77	2,71	4	2,81		0,08	2,91	94,88
9	F27x	PD01	DB01	2,80	2,92	2,82	2,77	4	2,83		0,06	2,25	95,56
10	F21x	PC02	DB09	2,85	2,86	2,79	2,81	4	2,83		0,03	1,17	95,64
11	A82	PD01	DB08	2,87	2,84	2,86	2,84	4	2,85		0,02	0,54	96,38
12	F05x	PD02	DB08	2,86	2,84	2,86	2,86	4	2,86		0,01	0,35	96,57
13	A56	PC01	DB08	2,90	2,86	2,93	2,77	4	2,86		0,07	2,50	96,82
14	A45	PE99	DB08	2,84	2,89	2,82	2,92	4	2,87		0,05	1,59	96,99
15	F25x	PB06	DB08	2,89	2,89	2,85	2,87	4	2,87		0,02	0,60	97,22
16	A90	PD99	DB10	2,94	2,99	2,89	2,80	4	2,91		0,08	2,79	98,26
17	F07x	PD03	DB08	2,93	2,91	2,95	2,92	4	2,93		0,02	0,55	99,04
18	F26x	PD02	DB09	2,95	2,94	2,95	2,94	4	2,95		0,01	0,20	99,61
19	F08x	PE99	DB08	2,97	2,97	2,93	2,92	4	2,95		0,02	0,83	99,68
20	F03x	PD02	DB08	3,02	3,02	2,90	2,93	4	2,97		0,06	2,15	100,37
21	F02x	PD02	DB08	3,05	2,84	3,19	2,84	4	2,98		0,17	5,75	100,80
22	A49x	PC03	DB08	3,01	3,01	3,00	2,95	4	2,99		0,03	0,99	101,19
23	F18x	PD99	DB08	3,02	3,02	2,93	3,00	4	2,99		0,04	1,43	101,22
24	F06x	PD02	DB08	3,02	2,94	2,98	3,07	4	3,00		0,05	1,79	101,59
25	F16x	PC01	DB08	3,01	3,06	2,96	3,00	4	3,01		0,04	1,44	101,66
26	A47x	PD01	DB08	3,00	2,99	3,02	3,03	4	3,01		0,02	0,61	101,81
27	F01	PD02	DB01	3,06	3,01	3,02	3,00	4	3,02		0,03	0,87	102,23
28	F15x	PC01	DB08	3,03	3,02	3,03	3,07	4	3,04		0,02	0,73	102,74
29	F32	PD01	DB08	3,04	3,04	3,04	3,05	4	3,04		0,00	0,16	102,74
30	A61x	PB02	DB08	3,05	3,11	2,97	3,10	4	3,06		0,06	2,02	103,40
31	F14x	PC01	DB08	3,11	3,11	3,10	3,09	4	3,10		0,01	0,31	104,94
32	A88	PD01	DB08	2,75	3,07	3,33	3,36	0	3,13	c	0,29	9,12	105,87
33	F28	PD02	DB08	3,13	3,15	3,19	3,11	4	3,15		0,03	1,06	106,44
34	F24x	PD02	DB99	3,16	3,18	3,15	3,14	4	3,16		0,02	0,54	106,80
35	F13x	PD01	DB08	3,20	3,18	3,18	3,17	4	3,18		0,01	0,29	107,62
36	F12x	PD01	DB08	3,16	3,27	3,20	3,14	4	3,19		0,06	1,82	107,94
37	F19x	PD02	DB08	3,24	3,22	3,30	3,07	4	3,21		0,10	3,05	108,49
38	A91	PB05	DB08	3,47	3,37	3,29	3,02	4	3,29	*	0,19	5,87	111,13
39	F33x	PD01	DB10	3,13	3,35	3,44	3,43	4	3,34	*	0,14	4,32	112,89
40	A42	PB04	DB01	3,25	3,34	3,41	3,44	4	3,36	*	0,08	2,51	113,65
41	A97	PD02	DB10	3,94	3,70	3,82	3,65	0	3,78	b *	0,13	3,43	127,77
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n Mean s_r CV_r
all labs 156 2,96 0,052 1,753

* = non tolerable mean because more than +/-

10 % from the mean

l s_R CV_R
39 0,197 6,658

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: K

Sample: 1

Unit: mg/g

No.	Lab. Code	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery %
		P	D	1	2	3	4				s _i	V _i	
1	A91	PB04	DB08	5,70	5,23	5,37	5,42	0	5,43	b *	0,20	3,70	67,16
2	F27x	PD01	DB06	6,73	6,57	6,97	7,03	0	6,83	b *	0,21	3,15	84,44
3	A42	PB04	DB01	7,04	6,93	7,35	7,25	4	7,14	*	0,19	2,68	88,36
4	A62x	PD02	DB01	7,44	7,12	7,29	7,06	4	7,23	*	0,17	2,38	89,41
5	F08x	PZ99	DB08	7,41	7,71	7,72	7,52	4	7,59		0,15	1,96	93,86
6	A88	PD01	DB08	7,61	7,73	7,60	7,65	4	7,65		0,06	0,79	94,60
7	A36	PD02	DB08	7,89	7,54	7,79	7,59	4	7,70		0,17	2,14	95,28
8	F03x	PD02	DB08	7,63	7,66	7,76	7,79	4	7,71		0,07	0,97	95,38
9	A85x	PB05	DB08	7,86	7,90	7,99	7,48	4	7,81		0,22	2,87	96,61
10	F19x	PD02	DB08	8,32	7,59	7,06	8,50	0	7,87	c	0,67	8,48	97,32
11	S22x	PD02	DB10	7,93	7,89	7,94	7,91	4	7,92		0,02	0,28	97,94
12	A60x	PD01	DB10	8,04	7,98	7,93	7,80	4	7,94		0,10	1,30	98,18
13	F26x	PD02	DB09	7,93	7,91	7,96	7,98	4	7,95		0,03	0,39	98,28
14	A57	PZ02	DD02	7,93	8,00	7,92	8,00	4	7,96		0,04	0,55	98,50
15	A56	PC01	DB08	8,13	7,70	8,44	7,58	4	7,96		0,39	4,96	98,50
16	F02x	PD02	DB08	9,07a	8,07	8,03	7,90	3	8,00		0,09	1,11	98,96
17	A90	PD99	DB10	7,98	8,08	8,14	7,85	4	8,01		0,13	1,58	99,12
18	F33x	PD01	DB10	7,98	7,86	8,12	8,17	4	8,03		0,14	1,75	99,37
19	F21x	PC02	DB09	8,12	8,04	8,08	8,10	4	8,09		0,03	0,42	100,01
20	A61x	PB02	DB08	8,02	8,13	8,17	8,16	4	8,12		0,07	0,87	100,45
21	A45	PB99	DB08	8,17	8,15	8,11	8,14	4	8,14		0,03	0,31	100,73
22	F25x	PB06	DB08	8,28	8,04	8,02	8,24	4	8,14		0,13	1,62	100,75
23	F01	PD02	DB01	8,23	8,00	8,27	8,15	4	8,16		0,12	1,46	100,97
24	F18x	PD99	DB08	8,19	8,18	8,17	8,12	4	8,17		0,03	0,38	101,00
25	A49x	PC03	DB08	8,25	8,27	8,20	8,16	4	8,22		0,05	0,59	101,69
26	F15x	PC01	DB08	8,31	8,22	8,17	8,27	4	8,24		0,06	0,74	101,96
27	F05x	PD02	DB08	8,22	8,29	8,24	8,27	4	8,26		0,03	0,38	102,12
28	A43x	PB06	DB01	8,26	8,37	8,15	8,26	4	8,26		0,09	1,09	102,18
29	F24x	PD02	DB99	8,33	8,08	8,43	8,28	4	8,28		0,15	1,78	102,43
30	F07x	PD03	DB08	8,25	8,10	8,23	8,62	4	8,30		0,22	2,68	102,69
31	A65	PD01	DB08	8,28	8,26	8,23	8,46	4	8,31		0,10	1,24	102,78
32	A47x	PD01	DB08	8,32	8,37	8,25	8,30	4	8,31		0,05	0,60	102,80
33	F16x	PC01	DB08	8,27	8,31	8,31	8,37	4	8,32		0,04	0,51	102,87
34	A82	PD01	DB08	8,29	8,32	8,38	8,33	4	8,33		0,04	0,47	103,01
35	F28	PD02	DB08	8,33	8,35	8,39	8,26	4	8,33		0,05	0,62	103,06
36	F13x	PD01	DB08	8,53	8,65	8,28	8,38	4	8,46		0,16	1,92	104,66
37	F14x	PC01	DB08	8,45	8,47	8,47	8,48	4	8,47		0,01	0,15	104,75
38	F06x	PD02	DB08	8,48	8,54	8,58	8,52	4	8,53		0,04	0,47	105,49
39	F32	PD01	DB08	8,56	8,54	8,54	8,668a	3	8,55		0,01	0,14	105,74
40	F12x	PD01	DB08	8,55	8,59	8,68	8,68	4	8,63		0,07	0,78	106,69
41	A97	PD02	DB10	9,39	9,65	9,37	9,47	0	9,47	b *	0,13	1,35	117,15
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n Mean s_r CV_r
all labs 146 8,08 0,097 1,197

* = non tolerable mean because more than +/-

10 % from the mean

l s_R CV_R
37 0,334 4,128

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: K

Sample: 2

Unit: mg/g

No.	Lab. Code	Method code		Replications				n	Lab.mean	Lab.standard dev.		Recovery %	
		P	D	1	2	3	4			s _i	V _i		
1	A91	PB04	DB08	3,49	3,49	3,11	3,73	0	3,45	b *	0,26	7,42	69,74
2	F27x	PD01	DB06	3,61	3,58	3,63	4,086a	0	3,60	b *	0,03	0,75	72,81
3	A62x	PD02	DB01	3,80	3,44	3,76	3,46	0	3,62	b *	0,19	5,29	73,03
4	S22x	PD02	DB10	4,40	4,42	4,39	4,41	4	4,41	*	0,01	0,29	88,99
5	A42	PB04	DB01	4,55	4,50	4,51	4,46	4	4,51		0,04	0,82	91,01
6	F19x	PD02	DB08	4,32	5,07	4,88	4,27	0	4,64	c	0,40	8,65	93,63
7	A36	PD02	DB08	4,80	4,57	4,64	4,55	4	4,64		0,11	2,44	93,74
8	F26x	PD02	DB09	4,63	4,62	4,66	4,65	4	4,64		0,02	0,39	93,74
9	A88	PD01	DB08	4,61	4,56	4,82	4,76	4	4,69		0,12	2,55	94,71
10	F08x	PZ99	DB08	4,82	4,96	4,65	4,52	4	4,74		0,19	4,11	95,70
11	A57	PZ02	DD02	4,70	4,77	4,72	4,82	4	4,75		0,05	1,13	96,01
12	A85x	PB05	DB08	4,86	4,85	4,64	4,67	4	4,76		0,12	2,46	96,07
13	A60x	PD01	DB10	4,64	4,79	4,87	4,80	4	4,77		0,10	2,02	96,42
14	F18x	PD99	DB08	4,80	4,80	4,79	4,78	4	4,79		0,01	0,20	96,82
15	A56	PC01	DB08	5,00	4,55	4,64	5,05	4	4,81		0,25	5,24	97,12
16	A90	PD99	DB10	4,83	4,84	4,86	4,85	4	4,85		0,01	0,27	97,88
17	F02x	PD02	DB08	4,85	4,91	4,83	4,88	4	4,87		0,04	0,72	98,33
18	A43x	PB06	DB01	4,90	4,90	4,90	4,79	4	4,87		0,06	1,13	98,43
19	F05x	PD02	DB08	4,93	4,93	4,94	4,95	4	4,94		0,01	0,19	99,75
20	A61x	PB02	DB08	4,94	4,99	4,91	4,95	4	4,95		0,03	0,61	99,91
21	A45	PB99	DB08	4,99	4,93	4,96	4,98	4	4,97		0,03	0,53	100,30
22	A82	PD01	DB08	5,05	4,95	4,95	5,04	4	5,00		0,05	1,08	100,92
23	F16x	PC01	DB08	5,01	4,95	5,03	5,00	4	5,00		0,03	0,66	100,99
24	A47x	PD01	DB08	4,96	5,04	5,03	5,00	4	5,01		0,04	0,72	101,16
25	F03x	PD02	DB08	4,96	4,97	5,15	5,08	4	5,04		0,09	1,75	101,79
26	F25x	PB06	DB08	5,01	5,02	5,07	5,07	4	5,04		0,03	0,69	101,86
27	A49x	PC03	DB08	5,13	5,06	5,08	5,03	4	5,08		0,04	0,79	102,54
28	F07x	PD03	DB08	5,06	4,93	5,07	5,29	4	5,09		0,15	2,99	102,73
29	F21x	PC02	DB09	5,11	5,07	5,08	5,12	4	5,10		0,02	0,47	102,93
30	F24x	PD02	DB99	4,98	5,12	5,23	5,11	4	5,11		0,10	2,00	103,23
31	F06x	PD02	DB08	5,12	5,11	5,19	5,08	4	5,12		0,05	0,89	103,48
32	F01	PD02	DB01	5,24	5,05	5,24	4,96	4	5,12		0,14	2,74	103,48
33	F32	PD01	DB08	5,07	5,15	5,14	5,16	4	5,13		0,04	0,74	103,63
34	A65	PD01	DB08	5,29	5,07	5,12	5,09	4	5,14		0,10	1,95	103,89
35	F15x	PC01	DB08	5,05	5,16	5,28	5,17	4	5,17		0,09	1,82	104,34
36	F33x	PD01	DB10	4,96	4,91	5,44	5,37	4	5,17		0,27	5,29	104,44
37	F28	PD02	DB08	5,16	5,34	5,07	5,15	4	5,18		0,11	2,20	104,67
38	F12x	PD01	DB08	5,22	5,15	5,13	5,37	4	5,22		0,11	2,03	105,40
39	F14x	PC01	DB08	5,28	5,26	5,28	5,24	4	5,27		0,02	0,36	106,36
40	F13x	PD01	DB08	5,29	5,31	5,17	5,46	4	5,31		0,12	2,24	107,24
41	A97	PD02	DB10	6,76	7,37	6,24	6,97	0	6,84	b *	0,47	6,88	138,08
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n Mean s_r CV_r
all labs **144** **4,95** **0,078** **1,575**

* = non tolerable mean because more than +/-

10 % from the mean

l s_R CV_R
36 **0,218** **4,399**

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: K

Sample: 3

Unit: mg/g

No.	Lab. Code	Method code		Replications				n	Lab.mean	Lab.standard dev.		Recovery %	
		P	D	1	2	3	4			s _i	V _i		
1	A62x	PD02	DB01	2,61	2,62	2,66	2,65	0	2,64	b *	0,02	0,90	67,52
2	A91	PB04	DB08	3,21	3,04	3,48	3,01	0	3,19	b *	0,22	6,77	81,65
3	F27x	PD01	DB06	3,31	3,30	3,21	3,33	4	3,29	*	0,05	1,56	84,25
4	A42	PB04	DB01	3,42	3,39	3,42	3,38	4	3,40	*	0,02	0,61	87,19
5	S22x	PD02	DB10	3,44	3,42	3,45	3,44	4	3,44	*	0,01	0,37	88,08
6	A88	PD01	DB08	3,87	3,47	3,61	3,55	4	3,63		0,17	4,74	92,89
7	F19x	PD02	DB08	3,73	3,72	3,93	3,35	0	3,68	c	0,24	6,57	94,36
8	A61x	PB02	DB08	3,70	3,69	3,70	3,67	4	3,69		0,01	0,37	94,57
9	F03x	PD02	DB08	3,63	3,72	3,72	3,71	4	3,69		0,04	1,13	94,62
10	F26x	PD02	DB09	3,72	3,73	3,72	3,75	4	3,73		0,01	0,38	95,58
11	A85x	PB05	DB08	3,75	3,85	3,71	3,65	4	3,74		0,08	2,18	95,82
12	A36	PD02	DB08	3,91	3,86	3,62	3,71	4	3,78		0,13	3,54	96,73
13	A82	PD01	DB08	3,84	3,80	3,81	3,73	4	3,79		0,05	1,20	97,22
14	A56	PC01	DB08	3,59	3,79	3,88	3,93	4	3,80		0,15	3,95	97,32
15	A57	PZ02	DD02	3,81	3,87	3,81	3,74	4	3,81		0,05	1,40	97,57
16	A60x	PD01	DB10	3,82	3,87	3,80	3,80	4	3,82		0,03	0,85	97,94
17	F18x	PD99	DB08	3,84	3,85	3,85	3,79	4	3,83		0,03	0,75	98,21
18	A90	PD99	DB10	3,85	3,86	3,93	3,91	4	3,89		0,04	0,99	99,62
19	F01	PD02	DB01	3,90	3,98	3,83	3,88	4	3,90		0,06	1,60	99,87
20	F02x	PD02	DB08	3,93	3,94	3,94	3,85	4	3,92		0,04	1,11	100,32
21	A45	PB99	DB08	3,93	3,93	3,93	3,91	4	3,93		0,01	0,25	100,58
22	A43x	PB06	DB01	3,88	3,98	3,88	3,96	4	3,93		0,05	1,34	100,58
23	F07x	PD03	DB08	3,91	3,84	3,93	4,05	4	3,93		0,09	2,20	100,71
24	A49x	PC03	DB08	3,95	3,94	3,94	3,90	4	3,93		0,03	0,64	100,78
25	F08x	PZ99	DB08	3,94	3,98	3,97	3,96	4	3,96		0,02	0,44	101,52
26	A47x	PD01	DB08	3,98	4,00	4,03	3,99	4	4,00		0,02	0,54	102,50
27	F05x	PD02	DB08	4,04	3,98	4,02	3,98	4	4,01		0,03	0,75	102,63
28	F24x	PD02	DB99	4,05	3,99	3,95	4,04	4	4,01		0,05	1,16	102,69
29	A65	PD01	DB08	4,05	4,00	4,03	4,00	4	4,02		0,02	0,61	103,01
30	F21x	PC02	DB09	4,11	4,01	3,94	4,04	4	4,03		0,07	1,75	103,14
31	F16x	PC01	DB08	4,05	4,10	4,04	4,06	4	4,06		0,03	0,63	104,13
32	F25x	PB06	DB08	4,09	4,10	4,04	4,10	4	4,08		0,03	0,70	104,61
33	F06x	PD02	DB08	4,14	4,11	4,13	4,11	4	4,12		0,02	0,38	105,62
34	F32	PD01	DB08	4,15	4,14	4,11	4,11	4	4,13		0,02	0,53	105,84
35	F13x	PD01	DB08	4,12	4,10	4,09	4,22	4	4,13		0,06	1,41	105,85
36	F15x	PC01	DB08	4,06	4,13	4,14	4,21	4	4,14		0,06	1,48	105,96
37	F14x	PC01	DB08	4,18	4,18	4,17	4,19	4	4,18		0,01	0,20	107,11
38	F12x	PD01	DB08	4,17	4,20	4,16	4,21	4	4,19		0,03	0,64	107,26
39	F33x	PD01	DB10	4,12	4,15	4,25	4,27	4	4,20		0,07	1,75	107,56
40	F28	PD02	DB08	4,25	4,35	4,28	4,32	4	4,30	*	0,04	1,01	110,14
41	A97	PD02	DB10	5,24	5,22	5,06	5,51	0	5,26	b *	0,19	3,55	134,72
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n Mean s_r CV_r
all labs **148** **3,90** **0,047** **1,208**

* = non tolerable mean because more than +/-

10 % from the mean

l s_R CV_R
37 **0,227** **5,821**

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: K

Sample: 4

Unit: mg/g

No.	Lab. Code	Method code		Replications				n	Lab.mean	*	Lab.standard dev.		Recovery %
		P	D	1	2	3	4				s _i	V _i	
1	A42	PB04	DB01	5,49	5,56	5,57	5,50	4	5,53	*	0,04	0,74	84,09
2	A91	PB04	DB08	5,76	5,48	5,55	5,65	4	5,61	*	0,12	2,17	85,30
3	S22x	PD02	DB10	5,73	5,74	5,71	5,72	4	5,73	*	0,01	0,23	87,05
4	F27x	PD01	DB06	5,94	5,95	5,88	5,378a	3	5,92		0,04	0,66	90,05
5	A85x	PB05	DB08	6,15	6,17	6,27	6,05	4	6,16		0,09	1,43	93,65
6	A61x	PB02	DB08	6,00	6,29	6,27	6,26	4	6,20		0,14	2,18	94,32
7	F05x	PD02	DB08	6,24	6,20	6,23	6,22	4	6,22		0,02	0,27	94,62
8	A43x	PB06	DB01	6,28	6,28	6,17	6,28	4	6,25		0,06	0,88	95,07
9	A60x	PD01	DB10	6,20	6,32	6,39	6,49	4	6,35		0,12	1,96	96,58
10	A57	PZ02	DD02	6,30	6,39	6,34	6,40	4	6,36		0,05	0,73	96,67
11	F08x	PZ99	DB08	6,53	6,55	6,14	6,25	4	6,37		0,20	3,18	96,81
12	A56	PC01	DB08	6,34	6,41	6,53	6,23	4	6,38		0,12	1,95	96,96
13	F26x	PD02	DB09	6,40	6,37	6,36	6,38	4	6,38		0,02	0,27	96,97
14	A36	PD02	DB08	6,59	6,49	6,11	6,35	4	6,39		0,21	3,26	97,09
15	F18x	PD99	DB08	6,44	6,38	6,36	6,44	4	6,41		0,04	0,64	97,39
16	A45	PB99	DB08	6,51	6,51	6,49	6,52	4	6,51		0,01	0,19	98,95
17	A90	PD99	DB10	6,39	6,62	6,69	6,43	4	6,53		0,15	2,22	99,33
18	F32	PD01	DB08	6,60	6,57	6,52	6,50	4	6,55		0,04	0,66	99,55
19	F01	PD02	DB01	6,60	6,59	6,73	6,47	4	6,60		0,11	1,61	100,32
20	A65	PD01	DB08	6,66	6,54	6,62	6,59	4	6,60		0,05	0,77	100,39
21	F25x	PB06	DB08	6,64	6,69	6,64	6,61	4	6,65		0,03	0,49	101,07
22	F19x	PD02	DB08	6,78	6,75	6,75	6,50	4	6,70		0,13	1,95	101,80
23	A49x	PC03	DB08	6,73	6,67	6,70	6,72	4	6,71		0,03	0,39	102,00
24	F02x	PD02	DB08	6,85	6,55	7,02	6,47	4	6,72		0,26	3,82	102,22
25	F24x	PD02	DB99	6,72	6,69	6,71	6,78	4	6,73		0,04	0,58	102,26
26	A47x	PD01	DB08	6,73	6,66	6,79	6,76	4	6,74		0,06	0,83	102,41
27	A82	PD01	DB08	6,79	6,77	6,82	6,77	4	6,79		0,02	0,37	103,18
28	F16x	PC01	DB08	6,79	6,88	6,78	6,83	4	6,82		0,04	0,65	103,69
29	F06x	PD02	DB08	6,82	6,82	6,79	6,92	4	6,84		0,05	0,80	103,96
30	F28	PD02	DB08	6,94	6,95	6,86	6,95	4	6,92		0,05	0,65	105,27
31	A88	PD01	DB08	7,28	6,44	6,86	7,11	4	6,92		0,36	5,24	105,28
32	F14x	PC01	DB08	6,90	7,00	6,90	6,90	4	6,93		0,05	0,72	105,30
33	F07x	PD03	DB08	6,90	6,76	6,95	7,29	4	6,97		0,22	3,22	106,05
34	F15x	PC01	DB08	6,99	7,04	7,02	7,04	4	7,02		0,02	0,34	106,78
35	F12x	PD01	DB08	7,05	7,03	7,04	7,02	4	7,03		0,01	0,16	106,96
36	F03x	PD02	DB08	6,88	6,99	7,17	7,11	4	7,04		0,13	1,79	107,02
37	F13x	PD01	DB08	7,19	7,04	7,15	7,19	4	7,14		0,07	1,00	108,61
38	F33x	PD01	DB10	6,86	7,01	7,71	7,39	4	7,24	*	0,38	5,29	110,13
39	F21x	PC02	DB09	7,36	7,29	7,43	7,48	4	7,39	*	0,08	1,12	112,37
40	A97	PD02	DB10	8,11	8,37	8,62	8,33	0	8,36	b *	0,21	2,50	127,08
41	A62x	PD02	DB01	18,65	19,70	19,48	20,38	0	19,55	b *	0,71	3,65	297,31
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n Mean s_r CV_r
all labs 155 6,58 0,094 1,434

* = non tolerable mean because more than +/-

10 % from the mean

l s_R CV_R
39 0,425 6,468

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: C

Sample: 1

Unit: g/100g

No.	Lab. Code	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery %
		P	D	1	2	3	4				s _i	V _i	
1	A91	PZ98	DA01	48,40	48,20	47,90	48,40	0	48,23	b *	0,24	0,49	93,99
2	A97	PZ98	DA02	48,43	48,25	48,34	48,37	0	48,35	b *	0,07	0,16	94,23
3	F02x	PZ98	DA01	49,94	50,37	49,64	49,87	4	49,96		0,30	0,61	97,36
4	F13x	PZ98	DA01	49,91	49,64	50,15	50,13	4	49,96		0,24	0,48	97,37
5	A57	PZ98	DA01	50,75	49,74	49,78	49,74	4	50,00		0,50	1,00	97,46
6	F08x	PZ98	DA01	50,53	51,17	50,37	50,37	4	50,61		0,38	0,76	98,64
7	A49x	PZ98	DA99	50,82	50,83	50,44	50,71	4	50,70		0,18	0,36	98,82
8	A42	PZ98	DA01	50,71	50,78	50,72	50,80	4	50,75		0,04	0,09	98,92
9	S22x	PZ98	DA02	50,90	50,10	51,10	51,20	4	50,83		0,50	0,98	99,06
10	F19x	PZ98	DA01	51,00	51,00	51,00	51,00	4	51,00		0,00	0,00	99,40
11	A86	PZ98	DA01	51,13	50,96	50,98	50,95	4	51,01		0,08	0,17	99,41
12	F26x	PZ98	DA02	51,00	51,10	51,00	51,10	4	51,05		0,06	0,11	99,50
13	F12x	PZ98	DA01	51,07	51,31	51,19	50,87	4	51,11		0,19	0,37	99,61
14	F05x	PZ98	DA01	51,05	51,23	51,04	51,24	4	51,14		0,11	0,21	99,67
15	F06x	PZ98	DA02	51,08	51,07	51,18	51,24	4	51,14		0,08	0,16	99,68
16	F15x	PZ98	DA01	51,21	51,17	51,18	51,16	4	51,18		0,02	0,04	99,75
17	F07x	PZ98	DA01	51,25	51,20	51,27	51,18	4	51,23		0,04	0,08	99,84
18	F03x	PZ98	DA01	51,15	51,48	51,10	51,62	4	51,34		0,25	0,49	100,06
19	A62x	PZ98	DA01	51,50	51,50	51,50	51,30	4	51,45		0,10	0,19	100,28
20	F21x	PZ98	DA01	51,37	51,44	51,52	51,49	4	51,46		0,07	0,13	100,29
21	A61x	PZ98	DA02	51,58	51,38	51,50	51,56	4	51,51		0,09	0,17	100,38
22	A88	PZ98	DA01	51,41	52,21	51,26	51,22	4	51,53		0,46	0,90	100,42
23	F25x	PZ98	DA01	51,49	51,51	51,59	51,53	4	51,53		0,04	0,08	100,43
24	A56	PZ98	DA02	51,53	51,55	51,54	51,57	4	51,55		0,02	0,03	100,47
25	F28	PZ98	DA01	51,70	51,60	51,40	51,50	4	51,55		0,13	0,25	100,47
26	A45	PZ98	DA01	51,90	51,60	51,40	51,30	4	51,55		0,26	0,51	100,47
27	A47x	PZ98	DA02	51,56	51,66	51,66	51,47	4	51,59		0,09	0,18	100,55
28	A65	PZ98	DA02	51,45	51,42	51,69	51,80	4	51,59		0,18	0,36	100,55
29	F14x	PZ98	DA01	51,60	51,60	51,60	51,60	4	51,60		0,00	0,00	100,57
30	A60x	PZ98	DA02	51,28	51,77	51,74	51,72	4	51,63		0,23	0,45	100,62
31	F32	PZ98	DA01	51,60	51,70	51,70	51,70	4	51,68		0,05	0,10	100,72
32	A82	PZ98	DA02	51,72	51,71	51,75	51,65	4	51,71		0,04	0,08	100,78
33	F18x	PZ98	DA01	52,00	51,50	51,80	51,70	4	51,75		0,21	0,40	100,86
34	F24x	PZ98	DA02	51,80	51,86	51,89	51,81	4	51,84		0,04	0,08	101,04
35	F16x	PZ98	DA02	51,74	52,20	51,70	51,86	4	51,88		0,23	0,44	101,11
36	F33x	PZ98	DA02	52,08	52,95	52,17	51,25	0	52,11	c	0,70	1,33	101,57
37	A85x	PZ98	DA01	51,87	52,58	52,38	52,99	4	52,46		0,47	0,89	102,24
38	F27x	PZ98	DA01	53,01	53,25	52,95	52,62	4	52,96		0,26	0,49	103,22
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n Mean s_r CV_r
all labs **140** **51,31** **0,170** **0,332**

* = non tolerable mean because more than +/-

5 % from the mean

l s_R CV_R
35 **0,617** **1,203**

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: C

Sample: 2

Unit: g/100g

No.	Lab. Code	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery %
		P	D	1	2	3	4				s _i	V _i	
1	A91	PZ98	DA01	47,40	47,60	47,30	47,70	0	47,50	b *	0,18	0,38	94,24
2	A97	PZ98	DA02	47,54	47,50	47,54	47,52	0	47,53	b *	0,02	0,04	94,29
3	F13x	PZ98	DA01	48,80	49,18	49,31	48,96	4	49,06		0,23	0,46	97,34
4	F02x	PZ98	DA01	48,77b	49,25	49,21	49,25	3	49,24		0,02	0,05	97,68
5	A57	PZ98	DA01	50,27	48,93	48,89	48,92	0	49,25	c	0,68	1,38	97,71
6	F08x	PZ98	DA01	49,25	49,29	49,36	49,53	4	49,36		0,12	0,25	97,93
7	A86	PZ98	DA01	49,38	49,54	49,32	49,37	4	49,40		0,10	0,19	98,01
8	A49x	PZ98	DA99	49,67	49,80	49,44	49,55	4	49,62		0,16	0,31	98,43
9	F26x	PZ98	DA02	49,70	49,80	49,70	49,90	4	49,78		0,10	0,19	98,75
10	A42	PZ98	DA01	49,82	49,89	50,02	49,87	4	49,90		0,09	0,17	99,00
11	F19x	PZ98	DA01	50,10	50,10	50,10	50,10	4	50,10		0,00	0,00	99,40
12	S22x	PZ98	DA02	50,20	49,80	50,20	50,40	4	50,15		0,25	0,50	99,50
13	A60x	PZ98	DA02	49,98	50,15	50,33	50,15	4	50,15		0,14	0,29	99,50
14	F18x	PZ98	DA01	49,90	50,10	50,00	50,70	4	50,18		0,36	0,72	99,54
15	F15x	PZ98	DA01	50,22	50,23	50,22	50,27	4	50,24		0,02	0,05	99,66
16	F28	PZ98	DA01	50,10	50,20	50,50	50,20	4	50,25		0,17	0,34	99,69
17	F07x	PZ98	DA01	50,30	50,34	50,33	50,32	4	50,32		0,02	0,03	99,84
18	F05x	PZ98	DA01	50,37	50,43	50,37	50,41	4	50,40		0,03	0,06	99,98
19	A56	PZ98	DA02	50,53	50,30	50,37	50,39	4	50,40		0,10	0,19	99,99
20	F12x	PZ98	DA01	50,59	50,54	50,35	50,25	4	50,43		0,16	0,32	100,06
21	A62x	PZ98	DA01	50,50	50,50	50,40	50,50	4	50,48		0,05	0,10	100,14
22	F03x	PZ98	DA01	50,55	50,52	50,28	50,76	4	50,53		0,20	0,39	100,24
23	A61x	PZ98	DA02	50,57	50,51	50,49	50,59	4	50,54		0,05	0,09	100,27
24	A65	PZ98	DA02	50,48	50,49	50,59	50,60	4	50,54		0,06	0,13	100,27
25	F14x	PZ98	DA01	50,58	50,56	50,53	50,58	4	50,56		0,02	0,05	100,31
26	A45	PZ98	DA01	50,70	50,40	50,40	50,80	4	50,58		0,21	0,41	100,34
27	A47x	PZ98	DA02	50,26	50,74	50,66	50,64	4	50,58		0,21	0,42	100,34
28	A82	PZ98	DA02	50,50	50,57	50,66	50,64	4	50,59		0,07	0,14	100,37
29	F24x	PZ98	DA02	50,70	50,77	50,82	50,11	4	50,60		0,33	0,65	100,39
30	F16x	PZ98	DA02	50,68	50,72	50,41	50,60	4	50,60		0,14	0,27	100,39
31	F32	PZ98	DA01	50,70	50,80	50,70	50,70	4	50,73		0,05	0,10	100,64
32	F06x	PZ98	DA02	50,74	50,63	50,91	50,76	4	50,76		0,12	0,23	100,71
33	F21x	PZ98	DA01	50,99	51,08	50,93	50,95	4	50,99		0,07	0,13	101,16
34	F33x	PZ98	DA02	50,63	51,05	51,29	51,06	4	51,01		0,28	0,54	101,20
35	A85x	PZ98	DA01	50,42	51,13	51,23	51,44	4	51,06		0,44	0,87	101,29
36	F25x	PZ98	DA01	51,00	51,13	51,10	51,12	4	51,09		0,06	0,12	101,36
37	A88	PZ98	DA01	52,06	51,55	51,91	51,13	4	51,66		0,41	0,80	102,50
38	F27x	PZ98	DA01	52,09	52,22	52,00	51,81	4	52,03		0,17	0,33	103,22
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n Mean s_r CV_r
all labs 139 50,40 0,143 0,284

* = non tolerable mean because more than +/-

5 % from the mean

l s_R CV_R
35 0,622 1,235

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: C

Sample: 3

Unit: g/100g

No.	Lab. Code	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery %
		P	D	1	2	3	4				s _i	V _i	
1	A91	PZ98	DA01	48,40	48,50	48,40	48,70	0	48,50	b *	0,14	0,29	94,10
2	A97	PZ98	DA02	48,80	48,52	48,77	48,71	0	48,70	b *	0,13	0,26	94,48
3	F02x	PZ98	DA01	50,15	50,25	49,09	49,43	4	49,73		0,56	1,13	96,48
4	F13x	PZ98	DA01	49,63	49,98	49,52	49,84	4	49,74		0,21	0,42	96,51
5	A57	PZ98	DA01	51,41	50,20	50,12	50,02	0	50,44	c	0,65	1,29	97,86
6	F08x	PZ98	DA01	50,67	50,26	50,04	50,94	4	50,48		0,40	0,80	97,93
7	A86	PZ98	DA01	50,76	50,73	50,73	50,74	4	50,74		0,01	0,03	98,44
8	A49x	PZ98	DA99	50,75	50,77	50,88	50,62	4	50,76		0,11	0,21	98,47
9	F19x	PZ98	DA01	51,10	51,10	51,10	51,10	4	51,10		0,00	0,00	99,14
10	A42	PZ98	DA01	51,16	51,19	51,12	51,09	4	51,14		0,04	0,09	99,22
11	F26x	PZ98	DA02	51,20	51,30	51,20	51,30	4	51,25		0,06	0,11	99,43
12	F12x	PZ98	DA01	51,30	51,56	51,16	51,10	4	51,28		0,20	0,40	99,49
13	A56	PZ98	DA02	51,31	51,33	51,37	51,45	4	51,37		0,06	0,12	99,66
14	F21x	PZ98	DA01	51,48	51,45	51,32	51,37	4	51,41		0,07	0,14	99,73
15	F06x	PZ98	DA02	51,57	51,35	51,52	51,32	4	51,44		0,12	0,24	99,80
16	F07x	PZ98	DA01	51,38	51,50	51,40	51,49	4	51,44		0,06	0,12	99,81
17	F15x	PZ98	DA01	51,51	51,45	51,52	51,49	4	51,49		0,03	0,06	99,90
18	F28	PZ98	DA01	51,50	51,60	51,30	51,60	4	51,50		0,14	0,27	99,92
19	F03x	PZ98	DA01	51,44	51,56	51,41	51,76	4	51,54		0,16	0,31	100,00
20	A61x	PZ98	DA02	51,56	51,62	51,77	51,70	4	51,66		0,09	0,18	100,23
21	A88	PZ98	DA01	52,19	51,48	51,74	51,32	4	51,68		0,38	0,74	100,27
22	A47x	PZ98	DA02	51,86	51,63	51,60	51,81	4	51,73		0,13	0,25	100,35
23	A62x	PZ98	DA01	51,60	51,80	51,70	51,80	4	51,73		0,10	0,19	100,35
24	S22x	PZ98	DA02	51,10	51,50	52,20	52,50	0	51,83	c	0,64	1,23	100,55
25	A60x	PZ98	DA02	51,89	51,84	51,75	51,85	4	51,83		0,06	0,12	100,56
26	F05x	PZ98	DA01	51,89	51,83	51,83	51,84	4	51,85		0,03	0,06	100,59
27	F32	PZ98	DA01	51,80	51,80	51,90	52,00	4	51,88		0,10	0,18	100,64
28	F14x	PZ98	DA01	51,90	51,90	51,80	51,90	4	51,88		0,05	0,10	100,64
29	A65	PZ98	DA02	51,79	52,04	52,01	51,85	4	51,92		0,12	0,23	100,74
30	A45	PZ98	DA01	52,20	51,80	52,10	51,80	4	51,98		0,21	0,40	100,84
31	F16x	PZ98	DA02	51,87	51,93	52,12	52,05	4	51,99		0,11	0,22	100,87
32	A82	PZ98	DA02	52,07	52,03	52,18	51,99	4	52,07		0,08	0,16	101,02
33	F18x	PZ98	DA01	52,30	52,00	52,10	51,90	4	52,08		0,17	0,33	101,03
34	F24x	PZ98	DA02	51,98	52,08	52,09	52,18	4	52,08		0,08	0,16	101,05
35	A85x	PZ98	DA01	52,05	51,74	51,84	52,86	4	52,12		0,51	0,98	101,12
36	F25x	PZ98	DA01	52,17	52,22	52,36	52,15	4	52,22		0,10	0,19	101,32
37	F33x	PZ98	DA02	52,36	52,42	52,55	52,45	4	52,45		0,08	0,15	101,75
38	F27x	PZ98	DA01	52,95	53,04	52,95	52,74	4	52,92		0,13	0,24	102,67
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n Mean s_r CV_r
all labs **136** **51,54** **0,140** **0,272**

* = non tolerable mean because more than +/-

5 % from the mean

l s_R CV_R
34 **0,672** **1,304**

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: C

Sample: 4

Unit: g/100g

No.	Lab. Code	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery %
		P	D	1	2	3	4				s _i	V _i	
1	A97	PZ98	DA02	45,15	44,97	45,03	45,04	0	45,05	b *	0,07	0,17	93,31
2	A91	PZ98	DA01	45,20	45,30	45,10	45,20	0	45,20	b *	0,08	0,18	93,62
3	A57	PZ98	DA01	47,46	46,78	46,66	46,55	4	46,86		0,41	0,87	97,07
4	A86	PZ98	DA01	47,10	46,99	46,95	46,88	4	46,98		0,09	0,20	97,31
5	F02x	PZ98	DA01	46,63	46,83	47,23	47,35	4	47,01		0,34	0,72	97,37
6	F28	PZ98	DA01	47,40	47,70	47,50	47,60	4	47,55		0,13	0,27	98,49
7	A42	PZ98	DA01	47,67	47,60	47,54	47,48	4	47,57		0,08	0,17	98,54
8	F06x	PZ98	DA02	47,59	47,65	47,49	47,58	4	47,58		0,07	0,14	98,55
9	F26x	PZ98	DA02	47,50	47,60	47,60	47,70	4	47,60		0,08	0,17	98,59
10	F08x	PZ98	DA01	46,90	47,18	48,08	48,33	0	47,62	c	0,69	1,45	98,64
11	A56	PZ98	DA02	47,81	47,72	47,43	47,75	4	47,68		0,17	0,35	98,75
12	A62x	PZ98	DA01	47,80	47,70	47,70	47,80	4	47,75		0,06	0,12	98,90
13	S22x	PZ98	DA02	47,10	47,70	48,70	47,90	0	47,85	c	0,66	1,38	99,11
14	A49x	PZ98	DA99	48,00	47,94	47,89	47,68	4	47,88		0,14	0,29	99,17
15	F13x	PZ98	DA01	47,44	48,05	48,12	48,11	4	47,93		0,33	0,68	99,28
16	F19x	PZ98	DA01	48,00	48,00	47,90	47,90	4	47,95		0,06	0,12	99,32
17	F07x	PZ98	DA01	48,01	48,19	48,25	48,22	4	48,17		0,11	0,22	99,77
18	A85x	PZ98	DA01	47,64	47,54	48,84	48,74	0	48,19	c	0,70	1,44	99,82
19	F15x	PZ98	DA01	48,34	48,22	48,22	48,27	4	48,26		0,06	0,12	99,97
20	A47x	PZ98	DA02	48,38	48,36	48,18	48,19	4	48,28		0,11	0,22	100,00
21	F18x	PZ98	DA01	48,40	48,30	48,10	48,40	4	48,30		0,14	0,29	100,04
22	F12x	PZ98	DA01	48,61	48,33	48,29	48,28	4	48,38		0,16	0,32	100,20
23	A60x	PZ98	DA02	48,45	48,19	48,28	48,62	4	48,38		0,19	0,39	100,22
24	A61x	PZ98	DA02	48,40	48,48	48,42	48,61	4	48,48		0,09	0,20	100,41
25	A45	PZ98	DA01	48,80	48,60	48,30	48,40	4	48,53		0,22	0,46	100,51
26	F14x	PZ98	DA01	48,50	48,50	48,60	48,50	4	48,53		0,05	0,10	100,51
27	A82	PZ98	DA02	48,49	48,56	48,52	48,68	4	48,56		0,08	0,17	100,59
28	F05x	PZ98	DA01	48,61	48,65	48,61	48,61	4	48,62		0,02	0,04	100,71
29	F33x	PZ98	DA02	48,59	48,65	48,54	48,82	4	48,65		0,12	0,25	100,77
30	A65	PZ98	DA02	48,78	48,34	48,79	48,81	4	48,68		0,23	0,47	100,83
31	F03x	PZ98	DA01	48,57	49,06	48,68	48,71	4	48,76		0,21	0,43	100,99
32	F16x	PZ98	DA02	48,95	48,80	48,74	48,58	4	48,77		0,15	0,31	101,01
33	F24x	PZ98	DA02	48,83	48,88	49,02	48,72	4	48,86		0,12	0,25	101,21
34	F32	PZ98	DA01	49,00	48,90	48,90	49,00	4	48,95		0,06	0,12	101,39
35	A88	PZ98	DA01	49,17	49,22	48,89	48,83	4	49,03		0,20	0,40	101,55
36	F25x	PZ98	DA01	49,30	49,25	49,22	49,22	4	49,24		0,04	0,08	102,00
37	F21x	PZ98	DA01	49,62	49,65	49,68	49,64	4	49,65		0,03	0,05	102,83
38	F27x	PZ98	DA01	49,82	49,87	49,74	49,79	4	49,81		0,05	0,11	103,16
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n Mean s_r CV_r
all labs 132 48,28 0,133 0,275

* = non tolerable mean because more than +/-

5 % from the mean

l s_R CV_R
33 0,706 1,463

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: Zn

Sample: 1

Unit: µg/g

No.	Lab. Code	Method code		Replications				n	Lab.mean	Lab.standard dev.		Recovery %	
		P	D	1	2	3	4			s _i	V _i		
1	A80	PD03	DB10	27,60	27,50	27,60	27,50	4	27,55	0,06	0,21	87,79	
2	F08x	PE99	DB08	28,03	27,23	27,70	27,29	4	27,56	0,38	1,36	87,83	
3	F27	PD01	DB01	30,39	26,41	26,44	31,09	4	28,58	2,51	8,77	91,09	
4	F19x	PD02	DB08	30,00	28,00	25,90	30,80	4	28,68	2,19	7,65	91,38	
5	A36	PD02	DB08	29,91	29,10	29,50	28,22	4	29,18	0,72	2,47	93,00	
6	F12x	PD01	DB10	29,46	30,58	29,79	29,83	4	29,92	0,47	1,58	95,33	
7	F02x	PD02	DB08	35,8a	30,80	30,90	30,80	3	30,83	0,06	0,19	98,26	
8	A45	PB99	DB08	30,80	31,00	30,90	30,70	4	30,85	0,13	0,42	98,31	
9	F05x	PD02	DB08	31,18	30,87	30,87	30,98	4	30,98	0,15	0,47	98,71	
10	F07x	PD03	DB08	30,63	31,09	31,14	31,12	4	31,00	0,24	0,79	98,77	
11	A90	PD99	DB10	30,36	32,28	32,00	30,68	4	31,33	0,95	3,04	99,84	
12	A57	PZ01	DD02	30,80	31,50	31,60	31,50	4	31,35	0,37	1,18	99,90	
13	A60x	PD01	DB10	31,72	31,05	31,12	32,10	4	31,50	0,50	1,59	100,37	
14	F28	PD02	DB08	31,50	32,34	30,66	32,13	4	31,66	0,75	2,38	100,88	
15	F18x	PD99	DB10	31,60	31,70	31,50	31,90	4	31,68	0,17	0,54	100,94	
16	F03	PD02	DB08	31,40	31,61	31,72	32,19	4	31,73	0,33	1,05	101,12	
17	A65	PD01	DB08	31,70	31,80	31,60	32,30	4	31,85	0,31	0,98	101,50	
18	F33	PD01	DB10	30,47	32,27	32,62	32,62	4	32,00	1,03	3,22	101,96	
19	A47x	PD01	DB10	31,70	32,30	32,40	32,10	4	32,13	0,31	0,96	102,37	
20	A97	PD02	DB10	30,88	34,36	32,31	32,15	4	32,43	1,44	4,44	103,33	
21	F14	PC01	DB08	32,60	32,60	32,50	32,50	4	32,55	0,06	0,18	103,73	
22	F15x	PC01	DB08	32,10	32,50	32,50	33,10	4	32,55	0,41	1,27	103,73	
23	A49x	PC03	DB08	32,52	32,68	32,60	32,78	4	32,65	0,11	0,34	104,04	
24	F06x	PD02	DB08	32,90	32,80	32,80	32,50	4	32,75	0,17	0,53	104,37	
25	A88	PD01	DB08	33,07	32,31	33,27	32,52	4	32,79	0,45	1,38	104,50	
26	F16x	PC01	DB08	32,52	32,80	33,05	32,92	4	32,82	0,23	0,69	104,60	
27	F13x	PD01	DB08	33,60	34,50	31,80	32,50	4	33,10	1,19	3,60	105,48	
28	F32	PD01	DB08	34,20	33,80	33,20	34,50	4	33,93	0,56	1,66	108,11	
29	A82	PD01	DB08	34,47	32,53	34,37	34,59	4	33,99	0,98	2,88	108,32	
30	F24x	PD02	DB99	44,00	22,00	36,00	34,00	0	34,00	c	9,09	26,74	108,35
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n Mean s_r CV_r
all labs 115 31,38 0,595 1,895

* = non tolerable mean because more than +/-

15 % from the mean

l s_R CV_R
29 1,705 5,433

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: Zn

Sample: 2

Unit: µg/g

No.	Lab. Code	Method code		Replications				n	Lab.mean	Lab.standard dev.		Recovery %
		P	D	1	2	3	4			s _i	V _i	
1	A80	PD03	DB10	9,50	9,73	9,64	9,78	4	9,66	0,12	1,27	85,63
2	F08x	PE99	DB08	10,19	9,97	10,01	10,07	4	10,06	0,10	0,97	89,13
3	F19x	PD02	DB08	9,52	11,10	10,60	9,42	4	10,16	0,82	8,11	90,04
4	F12x	PD01	DB10	10,29	10,39	10,49	10,62	4	10,45	0,14	1,35	92,58
5	A57	PZ02	DD02	10,50	10,60	10,50	10,50	4	10,53	0,05	0,48	93,27
6	A36	PD02	DB08	10,77	10,93	10,12	10,38	4	10,55	0,37	3,49	93,49
7	F03	PD01	DB08	10,44	10,88	10,48	10,82	4	10,66	0,23	2,13	94,42
8	A60x	PD01	DB10	10,88	10,74	10,86	10,80	4	10,82	0,06	0,58	95,88
9	A45	PB99	DB08	11,00	10,70	10,80	10,90	4	10,85	0,13	1,19	96,15
10	A90	PD99	DB10	10,80	10,75	10,99	11,19	4	10,93	0,20	1,83	96,88
11	F02x	PD02	DB08	11,00	11,50	10,70	11,10	4	11,08	0,33	2,98	98,14
12	F07x	PD03	DB08	10,90	11,15	11,12	11,18	4	11,09	0,13	1,15	98,25
13	F18x	PD99	DB10	11,40	11,30	11,30	11,20	4	11,30	0,08	0,72	100,14
14	F06x	PD02	DB08	11,50	11,20	11,40	11,30	4	11,35	0,13	1,14	100,58
15	A65	PD01	DB08	11,60	11,60	11,10	11,10	4	11,35	0,29	2,54	100,58
16	F33	PD01	DB10	11,20	11,16	11,78	11,66	4	11,45	0,32	2,76	101,47
17	A47x	PD01	DB10	11,50	11,50	11,70	11,60	4	11,58	0,10	0,83	102,57
18	A88	PD01	DB08	11,80	11,87	11,64	11,29	4	11,65	0,26	2,22	103,24
19	A49x	PC03	DB08	11,82	11,57	11,84	11,87	4	11,77	0,14	1,16	104,34
20	F15x	PC01	DB08	12,00	11,80	11,80	11,50	4	11,78	0,21	1,75	104,35
21	F05x	PD02	DB08	11,76	11,97	11,69	11,76	4	11,80	0,12	1,03	104,52
22	F27	PD01	DB01	12,05	10,92	11,82	12,60	4	11,85	0,70	5,90	104,99
23	F32	PD01	DB08	11,90	11,80	11,90	12,30	4	11,98	0,22	1,85	106,12
24	F28	PD02	DB08	12,12	12,33	12,22	12,01	4	12,17	0,14	1,12	107,85
25	F16x	PC01	DB08	12,09	12,40	12,02	12,38	4	12,22	0,20	1,60	108,31
26	F13x	PD01	DB08	12,30	13,20	13,80	11,70	4	12,75	0,93	7,32	112,99
27	A82	PD01	DB08	12,65	13,33	12,54	12,97	4	12,87	0,36	2,76	114,07
28	A97	PD02	DB10	16,74	15,91	15,86	16,71	0	16,31	b *	0,49	144,49
29	F24x	PD02	DB99	49,00	23,00	25,00	32,00	0	32,25	b *	11,81	285,79
30	F14	PC01	DB08	32,20	32,50	32,40	32,40	0	32,38	b *	0,13	286,90
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* = non tolerable mean because more than +/- **20** % from the mean

n Mean s_r CV_r
all labs **108** **11,28** **0,254** **2,250**

Limit for the lower concentration range

l s_R CV_R
27 **0,793** **7,026**

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: Zn

Sample: 3

Unit: µg/g

No.	Lab. Code	Method code		Replications				n	Lab.mean	Lab.standard dev.		Recovery %	
		P	D	1	2	3	4			s _i	V _i		
1	A80	PD03	DB10	13,10	13,20	13,40	13,10	4	13,20	0,14	1,07	83,95	
2	F08x	PE99	DB08	13,86	14,15	13,78	13,74	4	13,88	0,19	1,35	88,28	
3	F19x	PD02	DB08	14,10	14,40	15,00	12,90	4	14,10	0,88	6,26	89,67	
4	F12x	PD01	DB10	14,57	14,58	14,55	14,64	4	14,59	0,04	0,27	92,75	
5	A36	PD02	DB08	15,15	14,81	14,51	14,96	4	14,86	0,27	1,82	94,49	
6	A57	PZ02	DD02	15,20	15,30	15,20	14,60	4	15,08	0,32	2,12	95,87	
7	F07x	PD03	DB08	15,39	15,00	14,95	15,31	4	15,16	0,22	1,45	96,43	
8	A60x	PD01	DB10	15,05	15,09	15,34	15,21	4	15,17	0,13	0,86	96,49	
9	A90	PD99	DB10	15,16	15,24	15,10	15,27	4	15,19	0,08	0,51	96,62	
10	A45	PB99	DB08	15,30	15,30	15,30	15,20	4	15,28	0,05	0,33	97,14	
11	F03	PD02	DB08	15,28	15,42	15,21	15,21	4	15,28	0,10	0,65	97,17	
12	F05x	PD02	DB08	15,54	15,33	15,64	15,33	4	15,46	0,16	1,01	98,32	
13	F02x	PD02	DB08	15,70	15,60	15,50	15,50	4	15,58	0,10	0,61	99,05	
14	A47x	PD01	DB10	15,90	16,20	15,50	15,70	4	15,83	0,30	1,89	100,64	
15	F18x	PD99	DB10	15,70	15,80	16,00	15,90	4	15,85	0,13	0,81	100,80	
16	A65	PD01	DB08	15,90	15,80	16,00	15,70	4	15,85	0,13	0,81	100,80	
17	F28	PD02	DB08	15,56	15,45	16,08	16,50	4	15,90	0,49	3,06	101,10	
18	F16x	PC01	DB08	15,89	15,92	16,10	16,37	4	16,07	0,22	1,37	102,20	
19	F27	PD01	DB01	16,05	16,95	15,30	16,00	4	16,08	0,68	4,21	102,23	
20	F14	PC01	DB08	16,20	16,10	16,10	16,10	4	16,13	0,05	0,31	102,55	
21	F06x	PD02	DB08	16,30	16,10	16,20	16,20	4	16,20	0,08	0,50	103,03	
22	A49x	PC03	DB08	17,39	16,59	16,50	16,16	4	16,66	0,52	3,12	105,95	
23	F33	PD01	DB10	16,68	16,77	16,55	16,73	4	16,68	0,10	0,57	106,09	
24	F32	PD01	DB08	16,70	16,80	17,00	16,90	4	16,85	0,13	0,77	107,16	
25	F15x	PC01	DB08	18,40	17,90	16,40	15,70	4	17,10	1,26	7,38	108,75	
26	F13x	PD01	DB08	17,30	17,10	16,70	17,70	4	17,20	0,42	2,42	109,39	
27	A82	PD01	DB08	17,06	17,55	17,14	17,65	4	17,35	0,29	1,69	110,34	
28	A88	PD01	DB08	17,47	17,33	18,47	17,64	4	17,73	0,51	2,88	112,74	
29	A97	PD02	DB10	20,94	20,57	18,78σ	20,81	0	20,77	b *	0,19	0,90	132,11
30	F24x	PD02	DB99	27,00	25,00	31,00	28,00	0	27,75	b *	2,50	9,01	176,48
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n Mean s_r CV_r
all labs **112** **15,72** **0,285** **1,810**

* = non tolerable mean because more than +/-

20 % from the mean

Limit for the lower concentration range

l s_R CV_R
28 **1,067** **6,788**

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: Zn

Sample: 4

Unit: µg/g

No.	Lab. Code	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery %
		P	D	1	2	3	4				s _i	V _i	
1	F08x	PE99	DB08	26,52	25,77	26,72	26,03	0	26,26	b *	0,44	1,67	80,63
2	A80	PD03	DB10	27,00	26,50	27,60	27,00	0	27,03	b *	0,45	1,67	82,98
3	A57	PZ02	DD02	29,30	29,90	30,70	30,00	4	29,98		0,57	1,91	92,04
4	F03	PD02	DB08	31,20	29,51	29,67	30,05	4	30,11		0,76	2,53	92,44
5	A36	PD02	DB08	30,98	29,88	30,15	29,48	4	30,12		0,63	2,11	92,49
6	F12x	PD01	DB10	30,19	31,03	30,26	29,94	4	30,36		0,47	1,55	93,20
7	A45	PB99	DB08	30,30	31,00	30,90	31,20	4	30,85		0,39	1,26	94,72
8	A65	PD01	DB08	31,40	30,60	30,80	31,80	4	31,15		0,55	1,77	95,64
9	A60x	PD01	DB10	31,29	31,31	31,76	31,98	4	31,59		0,34	1,08	96,98
10	F05x	PD02	DB08	31,67	31,90	32,02	31,61	4	31,80		0,19	0,61	97,64
11	F18x	PD99	DB10	31,70	32,00	32,60	32,10	4	32,10		0,37	1,17	98,56
12	F28	PD02	DB08	32,36	32,04	33,11	32,25	4	32,44		0,47	1,44	99,60
13	A90	PD99	DB10	34,57	32,56	32,38	31,04	4	32,64		1,46	4,46	100,21
14	A88	PD01	DB08	30,23	31,52	35,15	33,77	4	32,67		2,21	6,76	100,30
15	F19x	PD02	DB08	31,20	32,20	31,20	36,20	4	32,70		2,38	7,28	100,40
16	F02x	PD02	DB08	33,50	32,10	34,50	30,80	4	32,73		1,62	4,94	100,48
17	F15x	PC01	DB08	32,30	31,70	34,20	33,00	4	32,80		1,07	3,27	100,71
18	F07x	PD03	DB08	32,58	33,56	32,63	33,01	4	32,95		0,45	1,37	101,16
19	F27	PD01	DB01	32,40	33,81	33,59	32,18	4	33,00		0,82	2,50	101,31
20	A47x	PD01	DB10	32,60	33,00	33,40	33,60	4	33,15		0,44	1,34	101,78
21	F06x	PD02	DB08	32,70	33,20	32,70	34,40	4	33,25		0,80	2,41	102,09
22	F14	PC01	DB08	33,30	33,60	33,00	33,40	4	33,33		0,25	0,75	102,32
23	A49x	PC03	DB08	34,01	33,21	33,17	33,61	4	33,50		0,39	1,17	102,86
24	F32	PD01	DB08	33,90	33,80	33,80	33,20	4	33,68		0,32	0,95	103,40
25	F33	PD01	DB10	32,95	34,20	35,63	34,48	4	34,32		1,10	3,21	105,36
26	F16x	PC01	DB08	34,77	35,61	34,64	35,28	4	35,08		0,45	1,29	107,70
27	F13x	PD01	DB08	36,10	36,00	34,70	34,00	4	35,20		1,02	2,91	108,08
28	A82	PD01	DB08	34,66	35,73	34,68	36,29	4	35,34		0,81	2,28	108,51
29	A97	PD02	DB10	42,27	34,74	36,93	37,26	0	37,80	b *	3,18	8,42	116,06
30	F24x	PD02	DB99	41,00	40,00	44,00	39,00	0	41,00	b *	2,16	5,27	125,89
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n Mean s_r CV_r
all labs 104 32,57 0,783 2,404

* = non tolerable mean because more than +/-

15 % from the mean

l s_R CV_R
26 1,527 4,687

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: Mn

Sample: 1

Unit: µg/g

No.	Lab. Code	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery %
		P	D	1	2	3	4				s _i	V _i	
1	A43x	PB06	DB01	490,00	503,00	569a	508,00	0	500,33	b *	9,29	1,86	49,37
2	A97	PC02	DB10	853,50	896,44	934,68	899,78	4	896,10		33,25	3,71	88,42
3	F19x	PD02	DB08	964,00	892,00	820,00	990,00	0	916,50	c	76,53	8,35	90,43
4	F08x	PE99	DB08	926,80	927,38	950,72	944,64	4	937,38		12,15	1,30	92,50
5	A90	PD99	DB10	953,75	959,46	957,97	942,56	4	953,44		7,64	0,80	94,08
6	A36	PD02	DB08	978,63	953,31	969,80	952,25	4	963,50		12,90	1,34	95,07
7	F03	PD02	DB08	998,40	992,53	966,39	960,40	4	979,43		18,83	1,92	96,64
8	A47x	PD01	DB08	984,00	983,00	973,00	978,00	4	979,50		5,07	0,52	96,65
9	F25x	PB06	DB08	986,90	974,10	981,50	980,00	4	980,63		5,26	0,54	96,76
10	F16x	PC01	DB08	982,40	974,50	990,10	975,90	4	980,73		7,14	0,73	96,77
11	F15x	PC01	DB08	985,10	983,40	988,40	981,30	4	984,55		3,00	0,30	97,15
12	F07x	PD03	DB08	995,60	1008,00	982,90	990,20	4	994,18		10,58	1,06	98,10
13	F28	PD02	DB08	991,70	997,40	997,60	1000,30	4	996,75		3,62	0,36	98,35
14	A60x	PC01	DB10	1008,00	980,50	990,70	1012,00	4	997,80		14,78	1,48	98,46
15	A65	PD01	DB08	1016,00	1012,00	995,00	1009,00	4	1008,00		9,13	0,91	99,46
16	A82	PD01	DB08	1009,00	1006,00	1009,00	1010,00	4	1008,50		1,73	0,17	99,51
17	A45	PE99	DB08	1010,00	1010,00	1010,00	1010,00	4	1010,00		0,00	0,00	99,66
18	F33x	PD01	DB10	1020,00	989,00	1024,00	1009,00	4	1010,50		15,67	1,55	99,71
19	F18x	PD99	DB08	1020,00	1010,00	1020,00	1010,00	4	1015,00		5,77	0,57	100,15
20	F26x	PD02	DB09	1016,00	1017,00	1015,00	1016,00	4	1016,00		0,82	0,08	100,25
21	F02x	PD02	DB08	1121,00	989,00	986,00	990,00	0	1021,50	c	66,36	6,50	100,80
22	F05x	PD02	DB08	1022,00	1028,00	1019,00	1023,00	4	1023,00		3,74	0,37	100,94
23	A49x	PC03	DB08	1027,58	1028,98	1026,77	1025,07	4	1027,10		1,63	0,16	101,35
24	A57	PZ02	DD02	1020,50	1035,60	1029,20	1030,50	4	1028,95		6,27	0,61	101,53
25	F12x	PD01	DB08	1042,00	1034,00	1032,00	1039,00	4	1036,75		4,57	0,44	102,30
26	A80	PD03	DB10	1036,00	1035,00	1049,00	1042,00	4	1040,50		6,45	0,62	102,67
27	F14	PC01	DB08	1041,00	1045,00	1040,00	1041,00	4	1041,75		2,22	0,21	102,79
28	F27	PD01	DB01	1078,10	1059,40	993,70	1052,90	4	1046,03		36,48	3,49	103,22
29	F13x	PD01	DB08	1049,00	1094,00	1022,00	1043,00	4	1052,00		30,30	2,88	103,81
30	F06x	PD02	DB08	1066,00	1061,00	1067,00	1059,00	4	1063,25		3,86	0,36	104,92
31	A88	PD01	DB08	1043,70	1085,81	1071,41	1086,44	4	1071,84		20,00	1,87	105,76
32	F24x	PD02	DB99	1124,00	1126,00	1130,00	1127,00	4	1126,75		2,50	0,22	111,18
33	F32	PD01	DB08	1120,00	1131,00	1141,00	1141,00	4	1133,25		10,01	0,88	111,82
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n Mean s_r CV_r
all labs 120 1013,44 9,846 0,972

* = non tolerable mean because more than +/-

15 % from the mean

l s_R CV_R
30 49,181 4,853

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: Mn

Sample: 2

Unit: µg/g

No.	Lab. Code	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery %
		P	D	1	2	3	4				s _i	V _i	
1	A43x	PB06	DB01	25,50	25,50	25,50	26,1c	0	25,50	b *	0,00	0,00	60,42
2	A57	PZ02	DD02	35,80	37,10	35,50	36,50	4	36,23		0,72	1,98	85,83
3	F08x	PE99	DB08	36,58	35,81	36,05	36,66	4	36,28		0,41	1,14	85,95
4	F19x	PD02	DB08	37,00	41,20	39,60	34,70	4	38,13		2,87	7,52	90,33
5	F27	PD01	DB01	39,38	39,47	40,24	38,61	4	39,43		0,67	1,69	93,41
6	A36	PD02	DB08	42,17	39,65	39,90	38,69	4	40,10		1,47	3,67	95,01
7	A47x	PD01	DB08	39,80	40,70	40,10	40,30	4	40,23		0,38	0,94	95,30
8	F07x	PD03	DB08	39,30	39,74	42,31	41,30	4	40,66		1,39	3,43	96,34
9	F25x	PB06	DB08	41,70	40,10	41,50	39,70	4	40,75		1,00	2,45	96,55
10	A45	PE99	DB08	41,60	40,10	40,60	40,80	4	40,78		0,62	1,53	96,61
11	A90	PD99	DB10	40,98	40,21	41,29	42,23	4	41,18		0,84	2,03	97,56
12	A60x	PC01	DB10	41,11	41,09	41,08	41,91	4	41,30		0,41	0,99	97,84
13	F15x	PC01	DB08	41,50	41,60	41,80	40,80	4	41,43		0,43	1,05	98,15
14	F16x	PC01	DB08	41,89	41,04	42,33	41,15	4	41,60		0,61	1,48	98,57
15	F28	PD02	DB08	41,93	42,67	41,30	42,04	4	41,99		0,56	1,34	99,47
16	F05x	PD02	DB08	42,05	41,94	42,25	42,23	4	42,12		0,15	0,35	99,79
17	F18x	PD99	DB08	42,30	42,50	42,50	42,30	4	42,40		0,12	0,27	100,46
18	A49x	PC03	DB08	41,90	42,86	42,77	42,86	4	42,60		0,47	1,09	100,92
19	F26x	PD02	DB09	42,93	42,70	42,71	42,80	4	42,79		0,11	0,25	101,37
20	F02x	PD02	DB08	43,20	43,50	40,90	43,90	4	42,88		1,35	3,14	101,58
21	A65	PD01	DB08	44,00	46,00	41,00	41,00	4	43,00		2,45	5,70	101,88
22	A80	PD03	DB10	42,70	43,60	44,00	42,70	4	43,25		0,66	1,52	102,47
23	F14	PC01	DB08	43,20	43,20	43,83	43,39	4	43,41		0,30	0,68	102,84
24	F06x	PD02	DB08	43,90	43,50	43,50	44,00	4	43,73		0,26	0,60	103,60
25	F33x	PD01	DB10	43,00	43,50	44,40	45,20	4	44,03		0,97	2,21	104,31
26	A82	PD01	DB08	44,19	44,35	44,52	43,86	4	44,23		0,28	0,64	104,79
27	F12x	PD01	DB08	44,30	44,60	44,70	44,80	4	44,60		0,22	0,48	105,67
28	F03	PD02	DB08	44,20	46,40	45,30	44,50	4	45,10		0,98	2,18	106,85
29	F13x	PD01	DB08	45,00	48,00	44,00	45,00	4	45,50		1,73	3,81	107,80
30	F32	PD01	DB08	47,70	47,90	47,60	48,20	4	47,85		0,26	0,55	113,37
31	A88	PD01	DB08	50,06	47,22	49,30	48,26	4	48,71	*	1,24	2,54	115,41
32	A97	PC02	DB10	53,05	56,65	48,05	47,46	0	51,30	b *	4,36	8,50	121,55
33	F24x	PD02	DB99	53,00	53,00	53,00	53,00	0	53,00	b *	0,00	0,00	125,57
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* = non tolerable mean because more than +/-

n Mean s_r CV_r
all labs 120 42,21 0,797 1,889

15 % from the mean

l s_R CV_R
30 2,792 6,616

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: Mn

Sample: 3

Unit: µg/g

No.	Lab. Code	Method code		Replications				n	Lab.mean	Lab.standard dev.		Recovery %	
		P	D	1	2	3	4			s _i	V _i		
1	A43x	PB06	DB01	655,00	629,00	603,00	603,00	0	622,50	b *	24,89	4,00	49,53
2	F19x	PD02	DB08	1110,00	1100,00	1170,00	1000,00	0	1095,00	c	70,47	6,44	87,12
3	F08x	PE99	DB08	1166,69	1183,02	1137,52	1147,07	4	1158,57		20,32	1,75	92,18
4	A90	PD99	DB10	1182,38	1171,97	1174,51	1181,50	4	1177,59		5,14	0,44	93,69
5	A65	PD01	DB08	1188,00	1181,00	1181,00	1169,00	4	1179,75		7,89	0,67	93,86
6	A36	PD02	DB08	1223,24	1156,84	1181,24	1163,15	4	1181,12		29,93	2,53	93,97
7	F03	PD02	DB08	1206,70	1201,60	1160,30	1166,40	4	1183,75		23,78	2,01	94,18
8	A97	PC02	DB10	1168,69	1228,19	1214,38	1213,58	4	1206,21		25,90	2,15	95,96
9	A60x	PC01	DB10	1211,00	1182,00	1219,00	1216,00	4	1207,00		16,99	1,41	96,03
10	A47x	PD01	DB08	1215,00	1198,00	1206,00	1227,00	4	1211,50		12,45	1,03	96,39
11	F27	PD01	DB01	1224,80	1262,20	1197,90	1202,70	4	1221,90		29,31	2,40	97,21
12	F07x	PD03	DB08	1234,00	1225,00	1221,00	1213,00	4	1223,25		8,73	0,71	97,32
13	F16x	PC01	DB08	1211,00	1263,00	1225,00	1229,00	4	1232,00		22,06	1,79	98,02
14	A82	PD01	DB08	1247,00	1244,00	1242,00	1201,00	4	1233,50		21,76	1,76	98,14
15	F15x	PC01	DB08	1248,40	1247,70	1224,10	1222,00	4	1235,55		14,46	1,17	98,30
16	F25x	PB06	DB08	1245,00	1246,00	1239,00	1227,00	4	1239,25		8,73	0,70	98,59
17	F18x	PD99	DB08	1240,00	1240,00	1240,00	1240,00	4	1240,00		0,00	0,00	98,65
18	F02x	PD02	DB08	1258,00	1247,00	1242,00	1228,00	4	1243,75		12,45	1,00	98,95
19	A49x	PC03	DB08	1233,56	1230,96	1255,13	1262,84	4	1245,62		15,78	1,27	99,10
20	A80	PD03	DB10	1240,00	1253,00	1269,00	1250,00	4	1253,00		12,03	0,96	99,69
21	A57	PZ02	DD02	1266,60	1292,00	1257,80	1255,10	4	1267,88		16,82	1,33	100,87
22	A45	PE99	DB08	1280,00	1270,00	1260,00	1270,00	4	1270,00		8,16	0,64	101,04
23	F05x	PD02	DB08	1264,00	1264,00	1285,00	1270,00	4	1270,75		9,91	0,78	101,10
24	F26x	PD02	DB09	1276,00	1270,00	1279,00	1274,00	4	1274,75		3,77	0,30	101,42
25	F28	PD02	DB08	1279,10	1289,60	1286,50	1282,30	4	1284,38		4,62	0,36	102,18
26	F12x	PD01	DB08	1280,00	1292,00	1295,00	1290,00	4	1289,25		6,50	0,50	102,57
27	F14	PC01	DB08	1298,00	1291,00	1291,00	1301,00	4	1295,25		5,06	0,39	103,05
28	F33x	PD01	DB10	1290,00	1293,00	1333,00	1301,00	4	1304,25		19,72	1,51	103,76
29	F06x	PD02	DB08	1299,00	1305,00	1317,00	1301,00	4	1305,50		8,06	0,62	103,86
30	F13x	PD01	DB08	1327,00	1345,00	1316,00	1356,00	4	1336,00		17,91	1,34	106,29
31	F24x	PD02	DB99	1377,00	1381,00	1406,00	1390,00	4	1388,50		12,87	0,93	110,47
32	A88	PD01	DB08	1418,35	1392,12	1410,86	1375,39	4	1399,18		19,32	1,38	111,32
33	F32	PD01	DB08	1416,00	1416,00	1406,00	1385,00	4	1405,75		14,61	1,04	111,84
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n Mean s_r CV_r
all labs 124 1256,93 14,034 1,117

* = non tolerable mean because more than +/-

15 % from the mean

l s_R CV_R
31 63,159 5,025

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: Mn

Sample: 4

Unit: µg/g

No.	Lab. Code	Method code		Replications				n	Lab.mean	Lab.standard dev.		Recovery %	
		P	D	1	2	3	4			s _i	V _i		
1	A43x	PB06	DB01	26,6a	26,10	26,10	26,10	0	26,10	b *	0,00	0,00	16,62
2	A65	PD01	DB08	149,00	144,00	140,00	138,00	4	142,75		4,86	3,40	90,88
3	F08x	PE99	DB08	148,93	150,15	138,23	141,04	4	144,59		5,85	4,05	92,05
4	A47x	PD01	DB08	147,00	145,00	146,00	146,00	4	146,00		0,82	0,56	92,95
5	A45	PE99	DB08	144,00	148,00	145,00	147,00	4	146,00		1,83	1,25	92,95
6	A57	PZ02	DD02	145,00	147,90	147,40	147,20	4	146,88		1,28	0,87	93,50
7	F19x	PD02	DB08	151,00	149,00	150,00	144,00	4	148,50		3,11	2,09	94,54
8	A36	PD02	DB08	150,17	146,17	150,55	147,38	4	148,57		2,13	1,44	94,58
9	A90	PD99	DB10	151,03	154,20	152,01	148,41	4	151,41		2,40	1,59	96,39
10	F07x	PD03	DB08	144,60	153,00	155,20	153,10	4	151,48		4,69	3,10	96,43
11	F25x	PB06	DB08	152,80	152,30	152,40	151,00	4	152,13		0,78	0,51	96,85
12	F15x	PC01	DB08	151,60	150,40	154,00	156,10	4	153,03		2,54	1,66	97,42
13	F27	PD01	DB01	155,40	155,10	155,40	148,10	4	153,50		3,60	2,35	97,72
14	A60x	PC01	DB10	150,90	154,80	153,40	156,40	4	153,88		2,33	1,52	97,96
15	F16x	PC01	DB08	153,30	157,50	153,10	154,40	4	154,58		2,03	1,31	98,41
16	A49x	PC03	DB08	156,34	154,79	154,16	154,25	4	154,88		1,01	0,65	98,60
17	F26x	PD02	DB09	155,40	155,40	155,50	155,60	4	155,48		0,10	0,06	98,98
18	F05x	PD02	DB08	155,00	157,00	156,00	155,00	4	155,75		0,96	0,61	99,15
19	F03	PD02	DB08	156,70	156,60	157,20	154,10	4	156,15		1,39	0,89	99,41
20	F18x	PD99	DB08	158,00	159,00	158,00	159,00	4	158,50		0,58	0,36	100,91
21	F33x	PD01	DB10	156,00	155,00	160,00	165,00	4	159,00		4,55	2,86	101,22
22	F02x	PD02	DB08	164,00	155,00	169,00	152,00	4	160,00		7,87	4,92	101,86
23	F06x	PD02	DB08	160,90	160,00	159,50	160,70	4	160,28		0,64	0,40	102,04
24	F14	PC01	DB08	161,80	161,10	160,90	162,20	4	161,50		0,61	0,37	102,82
25	F28	PD02	DB08	160,90	160,70	162,80	162,20	4	161,65		1,01	0,63	102,91
26	A82	PD01	DB08	162,30	161,10	164,00	159,90	4	161,83		1,75	1,08	103,02
27	A80	PD03	DB10	164,00	162,00	169,00	163,00	4	164,50		3,11	1,89	104,73
28	F12x	PD01	DB08	166,10	169,20	168,00	165,00	4	167,08		1,88	1,13	106,36
29	A97	PC02	DB10	185,00	161,05	164,31	173,45	0	170,95	c	10,74	6,28	108,83
30	F32	PD01	DB08	170,00	172,00	171,00	171,00	4	171,00		0,82	0,48	108,86
31	F13x	PD01	DB08	175,00	169,00	171,00	169,00	4	171,00		2,83	1,65	108,86
32	A88	PD01	DB08	171,30	180,05	177,86	173,04	4	175,56		4,08	2,32	111,77
33	F24x	PD02	DB99	182,00	183,00	182,00	181,00	4	182,00	*	0,82	0,45	115,87
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n Mean s_r CV_r
all labs 124 157,08 2,331 1,484

* = non tolerable mean because more than +/-

15 % from the mean

l s_R CV_R
31 9,298 5,919

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: Fe

Sample: 1

Unit: µg/g

No.	Lab. Code	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery %
		P	D	1	2	3	4				s _i	V _i	
1	A97	PD02	DB10	39,45	40,55	39,73	39,07	0	39,70	b *	0,63	1,58	58,39
2	F08x	PE99	DB08	49,36	46,65	52,44	52,45	4	50,23	*	2,79	5,56	73,87
3	F27	PD01	DB01	54,61	54,39	55,84	54,29	4	54,78		0,72	1,31	80,57
4	A36	PD02	DB08	60,41	62,77	60,43	56,02	4	59,91		2,82	4,70	88,11
5	A60x	PC01	DB10	63,29	59,85	60,88	64,58	4	62,15		2,17	3,49	91,40
6	F05x	PD02	DB08	63,50	63,50	61,40	62,30	4	62,68		1,02	1,63	92,18
7	F19x	PD02	DB08	67,30	61,40	56,70	68,20	4	63,40		5,39	8,50	93,24
8	A45	PE99	DB08	65,70	64,00	65,90	64,30	4	64,98		0,96	1,48	95,56
9	F25x	PB06	DB08	65,20	65,60	64,80	64,70	4	65,08		0,41	0,63	95,71
10	F28	PD02	DB08	64,57	65,30	66,04	65,67	4	65,40		0,63	0,96	96,18
11	F16x	PC01	DB08	65,66	66,62	65,69	64,72	4	65,67		0,78	1,18	96,58
12	F15x	PC01	DB08	67,00	65,30	65,30	65,20	4	65,70		0,87	1,32	96,62
13	A90	PD99	DB10	64,30	69,73	68,17	63,93	4	66,53		2,87	4,31	97,85
14	A80	PD03	DB10	66,90	67,10	67,00	66,60	4	66,90		0,22	0,32	98,39
15	A65	PD01	DB08	64,90	65,90	67,40	69,50	4	66,93		2,00	2,99	98,43
16	F14	PC01	DB08	67,60	67,40	68,10	67,00	4	67,53		0,46	0,68	99,31
17	F18x	PD99	DB08	69,40	68,90	68,70	66,60	4	68,40		1,24	1,81	100,60
18	F02x	PD02	DB08	73,30	66,50	71,10	63,70	4	68,65		4,35	6,34	100,96
19	A49x	PC03	DB08	69,36	70,44	70,49	70,96	4	70,31		0,68	0,96	103,41
20	F32	PD01	DB08	69,00	73,20	67,30	71,80	4	70,33		2,67	3,79	103,43
21	A47x	PD01	DB08	74,00	72,00	68,00	68,00	4	70,50		3,00	4,26	103,68
22	F03	PD02	DB08	72,84	70,49	69,13	70,45	4	70,73		1,54	2,18	104,02
23	F33x	PD01	DB10	74,66	73,54	71,25	69,00	4	72,11		2,51	3,49	106,06
24	A82	PD01	DB08	72,07	73,22	72,17	73,15	4	72,65		0,62	0,85	106,85
25	F07x	PD03	DB08	74,43	72,38	71,11	72,88	4	72,70		1,37	1,89	106,92
26	F12x	PD01	DB08	80,90	72,20	71,10	67,40	4	72,90		5,71	7,84	107,21
27	F06x	PD02	DB08	72,98	83,63	67,74	70,18	4	73,63		7,00	9,51	108,29
28	F13x	PD01	DB08	74,60	72,30	76,30	72,60	4	73,95		1,87	2,53	108,76
29	F26x	PD02	DB09	74,76	75,50	74,80	75,60	4	75,17		0,45	0,59	110,55
30	A57	PZ02	DD02	80,60	78,80	79,20	79,70	4	79,58		0,78	0,98	117,03
31	A88	PD01	DB08	74,65	88,92	78,73	79,32	4	80,41		6,04	7,52	118,25
32	F24x	PD02	DB99	140,00	45,00	109,00	120,00	0	103,50	b *	41,06	39,67	152,22
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* = non tolerable mean because more than +/-

n	Mean	s _r	CV _r
all labs 120	67,99	2,131	3,134
20	% from the mean		

l	s _R	CV _R
30	6,421	9,444

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: Fe

Sample: 2

Unit: µg/g

No.	Lab. Code	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery %
		P	D	1	2	3	4				s _i	V _i	
1	A97	PD02	DB10	76,56	78,45	77,21	77,01	0	77,31	b *	0,81	1,05	64,07
2	F27	PD01	DB01	100,91	96,16	99,90	104,78	4	100,44		3,54	3,53	83,24
3	F08x	PE99	DB08	97,03	96,84	105,28	104,54	4	100,92		4,61	4,57	83,64
4	F05x	PD02	DB08	111,00	110,00	110,00	112,00	4	110,75		0,96	0,86	91,78
5	A60x	PC01	DB10	115,00	109,20	112,80	116,90	4	113,48		3,31	2,91	94,04
6	F19x	PD02	DB08	107,00	125,00	117,00	105,00	4	113,50		9,29	8,19	94,06
7	F26x	PD02	DB09	113,30	113,50	113,60	113,70	4	113,53		0,17	0,15	94,08
8	A36	PD02	DB08	116,25	121,96	109,65	106,59	4	113,61		6,87	6,05	94,15
9	A90	PD99	DB10	114,00	111,53	114,47	119,37	4	114,84		3,28	2,86	95,17
10	A45	PE99	DB08	118,00	116,00	113,00	117,00	4	116,00		2,16	1,86	96,13
11	F28	PD02	DB08	117,05	115,58	116,53	118,00	4	116,79		1,01	0,87	96,79
12	F32	PD01	DB08	117,00	115,00	119,00	119,00	4	117,50		1,91	1,63	97,38
13	F16x	PC01	DB08	117,00	117,40	124,10	117,40	4	118,98		3,42	2,88	98,60
14	F15x	PC01	DB08	119,40	123,30	117,00	120,00	4	119,93		2,60	2,17	99,39
15	A65	PD01	DB08	124,90	154,3a	117,10	117,80	3	119,93		4,32	3,60	99,39
16	F06x	PD02	DB08	119,50	119,70	122,70	120,20	4	120,53		1,48	1,23	99,88
17	F02x	PD02	DB08	120,70	121,90	116,90	124,90	4	121,10		3,31	2,73	100,36
18	F14	PC01	DB08	119,70	119,50	121,80	123,40	4	121,10		1,85	1,53	100,36
19	A80	PD03	DB10	120,00	121,00	122,00	124,00	4	121,75		1,71	1,40	100,90
20	F18x	PD99	DB08	125,00	121,00	124,00	122,00	4	123,00		1,83	1,48	101,93
21	F03	PD02	DB08	125,65	124,18	121,46	123,09	4	123,60		1,77	1,43	102,43
22	A49x	PC03	DB08	121,44	121,27	126,15	126,41	4	123,82		2,84	2,30	102,61
23	F25x	PB06	DB08	126,70	118,30	124,90	127,40	4	124,33		4,15	3,34	103,03
24	A47x	PD01	DB08	122,00	123,00	126,00	129,00	4	125,00		3,16	2,53	103,59
25	F12x	PD01	DB08	128,40	130,20	120,70	130,20	4	127,38		4,53	3,56	105,56
26	F33x	PD01	DB10	128,35	135,23	129,81	124,94	4	129,58		4,28	3,30	107,39
27	A82	PD01	DB08	130,90	131,80	131,40	131,00	4	131,28		0,41	0,31	108,79
28	F13x	PD01	DB08	136,10	130,20	132,60	131,50	4	132,60		2,53	1,91	109,89
29	F07x	PD03	DB08	135,10	134,00	137,80	130,00	4	134,23		3,24	2,41	111,24
30	A88	PD01	DB08	131,04	131,01	136,37	139,25	4	134,42		4,09	3,04	111,40
31	F24x	PD02	DB99	94,00	173,00	152,00	120,00	0	134,75	c	34,83	25,85	111,67
32	A57	PZ02	DD02	136,70	137,60	132,50	137,00	4	135,95		2,33	1,71	112,67
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n Mean s_r CV_r
all labs 119 120,67 3,032 2,513

* = non tolerable mean because more than +/-

20 % from the mean

l s_R CV_R
30 8,768 7,267

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: Fe

Sample: 3

Unit: µg/g

No.	Lab. Code	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery %
		P	D	1	2	3	4				s _i	V _i	
1	A97	PD02	DB10	39,71	39,08	39,10	38,63	0	39,13	b *	0,44	1,13	64,63
2	F08x	PE99	DB08	45,86	45,60	48,83	55,72	4	49,00		4,71	9,62	80,94
3	A36	PD02	DB08	59,05	52,78	52,49	46,60	4	52,73		5,09	9,64	87,10
4	F27	PD01	DB01	53,87	53,78	49,58	54,40	4	52,91		2,24	4,22	87,39
5	A60x	PC01	DB10	54,19	55,74	54,64	53,17	4	54,44		1,07	1,96	89,91
6	A65	PD01	DB08	57,20	54,20	53,20	56,80	4	55,35		1,96	3,53	91,42
7	F15x	PC01	DB08	56,40	57,50	56,10	53,80	4	55,95		1,55	2,78	92,41
8	F19x	PD02	DB08	57,30	57,30	61,00	50,60	4	56,55		4,33	7,66	93,40
9	A90	PD99	DB10	56,94	57,77	55,76	57,63	4	57,03		0,92	1,61	94,19
10	A45	PE99	DB08	59,60	54,90	58,90	57,90	4	57,83		2,07	3,58	95,51
11	F05x	PD02	DB08	57,10	60,40	57,00	57,60	4	58,03		1,60	2,77	95,84
12	F14	PC01	DB08	57,30	57,40	58,50	59,40	4	58,15		0,99	1,71	96,05
13	F18x	PD99	DB08	60,80	59,70	59,90	57,50	4	59,48		1,40	2,36	98,24
14	F03	PD02	DB08	60,38	59,29	62,89	57,41	4	59,99		2,29	3,81	99,09
15	F28	PD02	DB08	58,23	62,01	59,59	60,88	4	60,18		1,63	2,71	99,40
16	F16x	PC01	DB08	60,01	61,12	60,42	60,81	4	60,59		0,48	0,79	100,08
17	A49x	PC03	DB08	64,62	59,18	58,22	60,40	4	60,60		2,82	4,66	100,10
18	A82	PD01	DB08	63,03	59,92	60,07	59,77	4	60,70		1,56	2,57	100,26
19	A80	PD03	DB10	68,50	56,90	62,10	57,00	4	61,13		5,48	8,97	100,96
20	F06x	PD02	DB08	61,97	61,67	61,19	60,54	4	61,34		0,62	1,02	101,32
21	F32	PD01	DB08	61,40	62,20	61,60	61,20	4	61,60		0,43	0,70	101,75
22	F26x	PD02	DB09	61,70	61,60	61,90	61,80	4	61,75		0,13	0,21	101,99
23	F02x	PD02	DB08	59,80	60,40	70,30	61,60	4	63,03		4,91	7,79	104,10
24	A47x	PD01	DB08	63,00	68,00	65,00	61,00	4	64,25		2,99	4,65	106,12
25	F13x	PD01	DB08	64,30	65,80	64,90	63,70	4	64,68		0,90	1,39	106,82
26	F12x	PD01	DB08	69,90	63,00	64,50	61,90	4	64,83		3,55	5,47	107,07
27	F25x	PB06	DB08	66,60	65,20	66,80	63,60	4	65,55		1,48	2,26	108,27
28	F07x	PD03	DB08	64,21	64,91	69,97	65,89	4	66,25		2,58	3,89	109,42
29	F33x	PD01	DB10	71,64	71,07	69,29	64,57	4	69,14		3,21	4,64	114,20
30	A57	PZ02	DD02	71,50	73,50	70,00	69,80	4	71,20		1,71	2,40	117,60
31	A88	PD01	DB08	70,32	69,80	75,86	72,32	4	72,08		2,75	3,81	119,05
32	F24x	PD02	DB99	91,00	126,00	55,00	58,00	0	82,50	b *	33,27	40,33	136,27
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* = non tolerable mean because more than +/-

n	Mean	s _r	CV _r
all labs 120	60,54	2,248	3,713
20	% from the mean		

l	s _R	CV _R
30	5,331	8,806

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: Fe

Sample: 4

Unit: µg/g

No.	Lab. Code	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery %
		P	D	1	2	3	4				s _i	V _i	
1	A97	PD02	DB10	201,80	198,72	205,26	203,42	0	202,30	b *	2,77	1,37	57,44
2	F08x	PE99	DB08	275,27	274,30	282,27	288,60	0	280,11	b *	6,68	2,38	79,53
3	A65	PD01	DB08	326,20	326,00	313,40	307,70	4	318,33		9,27	2,91	90,38
4	A57	PZ02	DD02	319,80	324,50	319,60	316,80	4	320,18		3,19	1,00	90,90
5	F05x	PD02	DB08	323,00	322,00	320,00	316,00	4	320,25		3,10	0,97	90,92
6	A36	PD02	DB08	330,92	324,72	333,13	326,50	4	328,82		3,88	1,18	93,36
7	A47x	PD01	DB08	331,00	331,00	343,00	334,00	4	334,75		5,68	1,70	95,04
8	A45	PE99	DB08	336,00	329,00	338,00	337,00	4	335,00		4,08	1,22	95,11
9	F25x	PB06	DB08	339,70	340,90	336,00	331,50	4	337,03		4,23	1,26	95,69
10	A60x	PC01	DB10	337,20	340,70	333,60	338,90	4	337,60		3,03	0,90	95,85
11	F02x	PD02	DB08	346,10	323,30	353,10	332,30	4	338,70		13,42	3,96	96,16
12	F27	PD01	DB01	345,80	344,40	339,70	330,20	4	340,03		7,05	2,07	96,54
13	F32	PD01	DB08	328,00	351,00	336,00	349,00	4	341,00		10,92	3,20	96,81
14	F26x	PD02	DB09	340,30	341,70	340,90	341,30	4	341,05		0,60	0,18	96,83
15	A90	PD99	DB10	346,43	355,94	333,32	330,98	4	341,67		11,69	3,42	97,00
16	F15x	PC01	DB08	337,60	346,50	345,60	347,70	4	344,35		4,58	1,33	97,77
17	F28	PD02	DB08	352,50	347,60	344,50	356,30	4	350,23		5,22	1,49	99,43
18	F06x	PD02	DB08	347,40	362,00	353,90	338,40	4	350,43		10,00	2,85	99,49
19	F19x	PD02	DB08	353,00	346,00	364,00	343,00	4	351,50		9,33	2,65	99,80
20	A80	PD03	DB10	335,00	334,00	390,00	359,00	0	354,50	c	26,34	7,43	100,65
21	F18x	PD99	DB08	354,00	362,00	355,00	356,00	4	356,75		3,59	1,01	101,29
22	F33x	PD01	DB10	355,50	363,76	361,99	367,88	4	362,28		5,15	1,42	102,86
23	F14	PC01	DB08	371,00	368,00	370,00	362,00	4	367,75		4,03	1,10	104,41
24	F13x	PD01	DB08	361,80	370,10	364,70	380,00	4	369,15		8,01	2,17	104,81
25	F16x	PC01	DB08	363,00	386,00	357,40	371,60	4	369,50		12,45	3,37	104,91
26	F12x	PD01	DB08	362,50	366,60	373,50	377,70	4	370,08		6,81	1,84	105,07
27	F03	PD02	DB08	363,07	378,94	366,98	372,68	4	370,42		6,92	1,87	105,17
28	F24x	PD02	DB99	403,00	397,00	343,00	350,00	0	373,25	c	31,12	8,34	105,97
29	A82	PD01	DB08	377,70	383,50	372,30	392,00	4	381,38		8,43	2,21	108,28
30	A49x	PC03	DB08	403,42	384,54	379,65	372,22	4	384,96		13,31	3,46	109,29
31	F07x	PD03	DB08	399,70	404,10	401,90	388,40	4	398,53		6,98	1,75	113,15
32	A88	PD01	DB08	416,26	391,79	399,68	394,33	4	400,52		11,00	2,75	113,71
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n Mean s_r CV_r
all labs **112** **352,22** **6,999** **1,987**

* = non tolerable mean because more than +/-

20 % from the mean

l s_R CV_R
28 **22,403** **6,361**

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: Cu

Sample: 1

Unit: µg/g

No.	Lab. Code	Method code		Replications				n	Lab.mean	Lab.standard dev.		Recovery %	
		P	D	1	2	3	4			s _i	V _i		
1	A36	PD02	DB08	2,99	2,81	2,88	2,71	4	2,85	0,12	4,14	92,46	
2	F33	PD01	DB10	2,93	2,65	2,95	2,87	4	2,85	0,14	4,83	92,54	
3	F32	PD01	DB08	2,82	2,89	2,86	2,90	4	2,87	0,04	1,25	93,11	
4	F13x	PD01	DB10	2,84	2,77	2,90	2,97	4	2,87	0,08	2,92	93,17	
5	F12x	PD01	DB10	2,97	2,86	2,84	2,94	4	2,90	0,07	2,26	94,16	
6	F05	PD02	DB08	2,94	2,92	2,94	2,94	4	2,94	0,01	0,34	95,30	
7	A45	PE99	DB08	2,86	2,99	2,99	2,92	4	2,94	0,06	2,13	95,46	
8	A90	PD99	DB10	2,91	3,00	3,00	2,93	4	2,96	0,05	1,58	96,11	
9	A80	PD03	DB10	2,96	3,01	2,99	2,96	4	2,98	0,02	0,82	96,76	
10	F08x	PD01	DB08	2,93	3,05	2,92	3,08	4	2,99	0,08	2,75	97,22	
11	F02x	PD02	DB08	3,36	2,95	2,90	2,84	4	3,01	0,24	7,83	97,82	
12	F07x	PD03	DB08	2,98	2,93	3,16	3,07	4	3,03	0,10	3,36	98,52	
13	A49x	PC03	DB08	3,11	3,04	3,01	3,04	4	3,05	0,04	1,35	98,97	
14	F06x	PD02	DB08	3,04	3,08	3,06	3,04	4	3,06	0,02	0,63	99,20	
15	F27	PD01	DB05	3,13	3,12	3,07	3,01	4	3,08	0,05	1,70	100,07	
16	F18x	PD99	DB10	3,10	3,14	3,08	3,12	4	3,11	0,03	0,83	100,98	
17	F03	PD02	DB08	3,12	3,10	3,19	3,06	4	3,12	0,05	1,73	101,24	
18	F28	PD02	DB08	3,19	3,08	2,95	3,28	4	3,13	0,14	4,56	101,47	
19	F19x	PD02	DB08	3,10	3,22	3,07	3,11	4	3,13	0,07	2,10	101,47	
20	A47x	PD01	DB10	3,34	3,12	3,01	3,05	4	3,13	0,15	4,70	101,63	
21	F16x	PC01	DB08	3,17	3,22	3,13	3,17	4	3,17	0,04	1,14	102,99	
22	A65	PD01	DB08	3,20	3,30	3,10	3,10	4	3,18	0,10	3,02	103,09	
23	F24x	PD02	DB99	3,84	1,65	4,04	3,18	4	3,18	1,08	34,07	103,17	
24	A60x	PD01	DB10	3,24	3,11	3,23	3,28	4	3,21	0,07	2,25	104,25	
25	A82	PD01	DB10	3,25	3,30	3,24	3,21	4	3,25	0,04	1,14	105,54	
26	F15x	PC01	DB09	3,49	3,51	3,01	3,53	4	3,39	0,25	7,40	109,91	
27	A57	PZ02	DD02	3,30	3,40	3,60	3,40	4	3,43	0,13	3,67	111,21	
28	F14	PC01	DB10	3,36	3,55	3,49	3,42	4	3,46	0,08	2,39	112,19	
29	A97	PD02	DB10	17,24	19,13	17,66	18,09	0	18,03	b *	0,81	4,50	585,44
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n	Mean	s _r	CV _r
all labs 112	3,08	0,119	3,868

* = non tolerable mean because more than +/-

20 % from the mean

l	s _R	CV _R
28	0,166	5,391

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: Cu

Sample: 2

Unit: µg/g

No.	Lab. Code	Method code		Replications				n	Lab.mean	Lab.standard dev.		Recovery %	
		P	D	1	2	3	4			s _i	V _i		
1	F15x	PC01	DB09	2,51	2,62	2,59	2,39	4	2,53	0,10	4,07	84,09	
2	F08x	PD01	DB08	2,52	2,62	2,66	2,87	4	2,67	0,15	5,49	88,66	
3	F32	PD01	DB08	2,89	2,82	2,79	2,78	4	2,82	0,05	1,76	93,82	
4	F28	PD02	DB08	2,76	2,69	2,98	2,87	4	2,83	0,13	4,50	93,98	
5	F19x	PD02	DB08	2,75	3,12	2,97	2,69	4	2,88	0,20	6,90	95,90	
6	F12x	PD01	DB10	2,90	2,83	2,90	2,96	4	2,90	0,06	1,92	96,43	
7	F05	PD02	DB08	2,94	2,94	2,85	2,87	4	2,90	0,05	1,62	96,48	
8	F02x	PD02	DB08	2,91	3,03	2,82	2,96	4	2,93	0,09	3,01	97,48	
9	A90	PD99	DB10	2,92	2,90	2,95	2,98	4	2,94	0,04	1,19	97,73	
10	A36	PD02	DB08	3,01	3,21	2,73	3,03	4	3,00	0,20	6,62	99,64	
11	F13x	PD01	DB10	2,92	3,07	3,09	2,98	4	3,01	0,08	2,63	100,30	
12	A80	PD03	DB10	2,99	3,05	2,98	3,04	4	3,02	0,04	1,16	100,31	
13	F27	PD01	DB05	2,98	3,04	3,01	3,05	4	3,02	0,03	1,04	100,36	
14	F33	PD01	DB10	3,08	2,98	3,03	3,02	4	3,03	0,04	1,36	100,72	
15	F07x	PD03	DB08	2,97	3,04	3,12	3,00	4	3,03	0,06	2,05	100,85	
16	F06x	PD02	DB08	3,12	2,92	3,05	3,06	4	3,04	0,08	2,77	101,05	
17	F18x	PD99	DB10	3,05	3,05	3,04	3,13	4	3,07	0,04	1,37	102,05	
18	F03	PD02	DB08	3,21	3,10	3,06	3,04	4	3,10	0,08	2,50	103,23	
19	A47x	PD01	DB10	3,10	3,06	3,25	3,02	4	3,11	0,10	3,23	103,38	
20	A82	PD01	DB10	3,11	3,15	3,11	3,13	4	3,13	0,02	0,51	103,97	
21	A49x	PC03	DB08	3,12	3,09	3,15	3,15	4	3,13	0,03	0,97	104,03	
22	A45	PE99	DB08	3,10	3,24	3,31	2,93	4	3,15	0,17	5,34	104,63	
23	A60x	PD01	DB10	3,16	3,13	3,18	3,13	4	3,15	0,02	0,78	104,81	
24	A65	PD01	DB08	3,30	3,20	3,10	3,10	4	3,18	0,10	3,02	105,63	
25	F16x	PC01	DB08	3,14	3,15	3,21	3,32	4	3,20	0,08	2,58	106,52	
26	A57	PZ02	DD02	3,40	3,30	3,60	3,40	4	3,43	0,13	3,67	113,95	
27	F14	PC01	DB10	3,79	3,63	3,72	3,63	0	3,69	b *	0,08	2,10	122,85
28	F24x	PD02	DB99	5,11	3,57	8,08	5,59	0	5,59	b *	1,87	33,50	185,89
29	A97	PD02	DB10	19,50	19,18	19,92	19,48	0	19,52	b *	0,30	1,56	649,41
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n Mean s_r CV_r
all labs 104 3,01 0,083 2,745

* = non tolerable mean because more than +/-

20 % from the mean

l s_R CV_R
26 0,179 5,946

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: Cu

Sample: 3

Unit: µg/g

No.	Lab. Code	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery %
		P	D	1	2	3	4				s _i	V _i	
1	F15x	PC01	DB09	2,46	2,66	2,72	2,19	4	2,51	*	0,24	9,53	75,40
2	A45	PE99	DB08	3,14	3,08	2,98	3,08	4	3,07		0,07	2,16	92,32
3	F19x	PD02	DB08	3,09	3,17	3,32	2,78	4	3,09		0,23	7,37	92,92
4	F07x	PD03	DB08	3,12	3,11	3,12	3,07	4	3,11		0,03	0,87	93,39
5	A36	PD02	DB08	3,21	3,23	2,98	3,17	4	3,15		0,11	3,64	94,65
6	F12x	PD01	DB10	3,17	3,08	3,24	3,16	4	3,16		0,07	2,11	95,11
7	F13x	PD01	DB10	2,98	3,28	3,24	3,19	4	3,17		0,13	4,15	95,32
8	A80	PD03	DB10	3,14	3,20	3,23	3,17	4	3,19		0,04	1,22	95,78
9	F02x	PD02	DB08	3,20	3,22	3,17	3,21	4	3,20		0,02	0,68	96,23
10	F32	PD01	DB08	3,21	3,27	3,26	3,23	4	3,24		0,03	0,85	97,50
11	A90	PD99	DB10	3,22	3,24	3,22	3,31	4	3,25		0,04	1,32	97,65
12	A47x	PD01	DB10	3,33	3,38	3,14	3,16	4	3,25		0,12	3,70	97,81
13	F06x	PD02	DB08	3,26	3,31	3,28	3,21	4	3,27		0,04	1,29	98,18
14	A49x	PC03	DB08	3,28	3,23	3,27	3,30	4	3,27		0,03	0,97	98,28
15	F27	PD01	DB05	3,43	3,30	3,25	3,17	4	3,28		0,11	3,33	98,76
16	F05	PD02	DB08	3,26	3,33	3,29	3,26	4	3,29		0,03	1,01	98,78
17	F08x	PD01	DB08	3,29	3,52	3,14	3,35	4	3,33		0,16	4,71	100,02
18	F16x	PC01	DB08	3,36	3,31	3,45	3,32	4	3,36		0,06	1,91	101,00
19	A60x	PD01	DB10	3,44	3,36	3,38	3,43	4	3,40		0,04	1,16	102,27
20	F18x	PD99	DB10	3,42	3,42	3,40	3,44	4	3,42		0,02	0,48	102,84
21	A65	PD01	DB08	3,40	3,50	3,60	3,30	4	3,45		0,13	3,74	103,74
22	F03	PD02	DB08	3,49	3,49	3,45	3,47	4	3,48		0,02	0,51	104,52
23	A82	PD01	DB10	3,52	3,50	3,50	3,52	4	3,51		0,01	0,36	105,56
24	A57	PZ02	DD02	3,60	3,60	3,60	3,40	4	3,55		0,10	2,82	106,75
25	F33	PD01	DB10	3,85	3,70	3,71	3,51	4	3,69		0,14	3,78	111,04
26	F28	PD02	DB08	4,01	4,27	3,79	3,98	4	4,01	*	0,20	4,92	120,66
27	F14	PC01	DB10	4,09	4,09	4,09	4,16	4	4,11	*	0,04	0,85	123,52
28	F24x	PD02	DB99	5,21	2,33	4,95	4,16	0	4,16	b *	1,30	31,25	125,17
29	A97	PD02	DB10	18,12	18,00	18,69	18,67	0	18,37	b *	0,36	1,97	552,40
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n Mean s_r CV_r
all labs 108 3,33 0,083 2,504

* = non tolerable mean because more than +/-

20 % from the mean

l s_R CV_R
27 0,300 9,024

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: Cu

Sample: 4

Unit: µg/g

No.	Lab. Code	Method code		Replications				n	Lab.mean	Lab.standard dev.		Recovery %
		P	D	1	2	3	4			s _i	V _i	
1	F08x	PD01	DB08	5,77	5,27	5,09	5,03	4	5,29	0,33	6,30	88,85
2	F05	PD02	DB08	5,55	5,53	5,60	5,55	4	5,56	0,03	0,54	93,33
3	F15x	PC01	DB09	5,43	5,61	5,65	5,73	4	5,61	0,13	2,26	94,12
4	F12x	PD01	DB10	5,69	5,61	5,60	5,58	4	5,62	0,05	0,87	94,36
5	A80	PD03	DB10	5,68	5,69	5,81	5,67	4	5,71	0,07	1,15	95,93
6	A45	PE99	DB08	5,70	5,65	5,79	5,76	4	5,73	0,06	1,09	96,14
7	A60x	PD01	DB10	5,68	5,85	5,69	5,72	4	5,74	0,08	1,39	96,31
8	A90	PD99	DB10	5,95	5,80	5,79	5,62	4	5,79	0,13	2,33	97,23
9	F02x	PD02	DB08	5,83	5,78	6,19	5,50	4	5,83	0,28	4,86	97,82
10	F32	PD01	DB08	5,77	5,73	5,89	5,92	4	5,83	0,09	1,58	97,86
11	A47x	PD01	DB10	5,74	5,81	5,80	6,04	4	5,85	0,13	2,26	98,20
12	F07x	PD03	DB08	5,90	5,83	5,83	5,84	4	5,85	0,03	0,57	98,23
13	A65	PD01	DB08	5,80	5,80	5,80	6,00	4	5,85	0,10	1,71	98,24
14	F06x	PD02	DB08	5,93	5,85	5,88	5,79	4	5,86	0,06	1,00	98,45
15	A36	PD02	DB08	6,30	5,87	5,64	5,80	4	5,90	0,28	4,78	99,12
16	F19x	PD02	DB08	6,06	5,93	5,90	5,92	4	5,95	0,07	1,22	99,96
17	F13x	PD01	DB10	6,16	5,91	6,12	6,03	4	6,05	0,11	1,84	101,64
18	F18x	PD99	DB10	6,04	6,07	6,08	6,05	4	6,06	0,02	0,30	101,77
19	A49x	PC03	DB08	6,11	6,29	5,99	6,11	4	6,12	0,12	2,03	102,82
20	F33	PD01	DB10	6,03	6,33	6,25	6,10	4	6,18	0,14	2,22	103,74
21	F27	PD01	DB05	6,32	6,20	6,14	6,20	4	6,21	0,08	1,23	104,36
22	A82	PD01	DB10	6,17	6,34	6,23	6,30	4	6,26	0,07	1,17	105,16
23	A57	PZ02	DD02	6,40	6,30	6,70	6,30	4	6,43	0,19	2,95	107,89
24	F28	PD02	DB08	6,32	6,63	6,55	6,34	4	6,46	0,15	2,38	108,48
25	F03	PD02	DB08	6,36	6,51	6,49	6,64	4	6,50	0,11	1,75	109,14
26	F16x	PC01	DB08	6,48	6,73	6,54	6,66	4	6,60	0,11	1,68	110,86
27	F14	PC01	DB10	6,90	6,93	7,19	7,20	0	7,06	b	2,30	118,47
28	F24x	PD02	DB99	7,12	9,11	5,97	6,70	0	7,23	b *	1,34	121,33
29	A97	PD02	DB10	18,56	18,32	18,40	16,95 _a	0	18,43	b *	0,12	309,44
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n Mean s_r CV_r
all labs 104 5,95 0,117 1,966

* = non tolerable mean because more than +/-

20 % from the mean

l s_R CV_R
26 0,319 5,363

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: Pb

Sample: 1

Unit: µg/g

No.	Lab. Code	Method code		Replications				n	Lab.mean	Lab.standard dev.		Recovery %	
		P	D	1	2	3	4			s _i	V _i		
1	A47x	PD01	DB10	0,050	0,040	0,040	0,040	4	0,04	0,01	11,76	63,19	
2	A36	PD02	DB10	0,043	0,044	0,042	0,043	4	0,04	0,00	1,90	63,94	
3	A80	PD03	DB10	0,045	0,046	0,042	0,044	4	0,04	0,00	3,54	65,50	
4	F12x	PD01	DB10	0,050	0,044	0,044	0,046	4	0,05	0,00	5,86	68,81	
5	A45	PB99	DB10	0,047	0,048	0,046	0,047	4	0,05	0,00	1,75	69,48	
6	A90	PD99	DB10	0,046	0,043	0,048	0,053	4	0,05	0,00	8,85	70,63	
7	F08x	PD01	DB10	0,046	0,039	0,056	0,051	4	0,05	0,01	15,63	71,45	
8	A82	PD01	DB10	0,047	0,057	0,045	0,048	4	0,05	0,01	10,44	73,01	
9	F13x	PD01	DB10	0,053	0,048	0,050	0,047	4	0,05	0,00	5,32	73,49	
10	F32	PD01	DB10	0,054	0,057	0,068	0,059	4	0,06	0,01	10,13	88,47	
11	F18x	PD99	DB10	0,070	0,058	0,057	0,070	4	0,06	0,01	11,25	94,68	
12	F33	PD01	DB10	0,070	0,067	0,075	0,070	4	0,07	0,00	4,70	104,83	
13	F14	PC01	DB10	0,163	0,169	0,168	0,153	4	0,16	*	0,01	4,48	242,74
14	F27	PD01	DB05	0,093	0,184	0,233	0,162	4	0,17	*	0,06	34,61	249,80
15	F07x	PD03	DB08	0,277	0,251	0,276	0,269	0	0,27	b *	0,01	4,42	398,75
16	A60x	PD01	DB10	0,063	0,272	0,599	0,737	0	0,42	b *	0,31	73,34	621,01
17	A97	PD02	DB10	0,980	1,020	1,030	0,870	0	0,98	b *	0,07	7,51	1449,74
18	F24	PD02	DB99	1,080	1,680	3,200	1,990	0	1,99	b *	0,89	44,89	2955,23
19													
20													
21	F19x	PD02	DB08	<1,29	<1,29	<1,63	<1,4			**			
22	A49x	PC03	DB08	<1,2	<1,2	<1,2	<1,2			**			
23	F15x	PC01	DB09	<,5	<,5	<,5	<,5						
24	F06x	PD02	DB08	<,5	<,5	<,5	<,5						
25	F02	PD02	DB05	<,5	<,5	<,5	<,5						
26	F05x	PD02	DB05	<,125	<,125	<,125	<,125						
27	F16x	PC01	DB10	<,04	<,04	<,04	<,04						
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n Mean s_r CV_r
 all labs **56** **0,07** **0,008** **11,932**

* = non tolerable mean because more than +/-

40 % from the mean

** = higher than maximum acceptable LOQ

Lower than the lowest evaluated result

l s_R CV_R
14 **0,042** **63,160**

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: Pb

Sample: 2

Unit: µg/g

No.	Lab. Code	Method code		Replications				n	Lab.mean	Lab.standard dev.		Recovery %	
		P	D	1	2	3	4			s _i	V _i		
1	F33	PD01	DB10	0,28	0,29	0,27	0,27	4	0,28	0,01	4,23	79,94	
2	F16x	PC01	DB10	0,29	0,30	0,29	0,29	4	0,29	0,00	1,48	84,43	
3	F05x	PD02	DB05	0,30	0,33	0,31	0,30	4	0,31	0,02	5,37	89,43	
4	A80	PD03	DB10	0,31	0,32	0,32	0,33	4	0,32	0,01	3,64	91,87	
5	A47x	PD01	DB10	0,32	0,32	0,33	0,32	4	0,32	0,01	1,55	92,74	
6	A36	PD02	DB10	0,34	0,35	0,31	0,31	4	0,33	0,02	6,64	93,74	
7	A45	PB99	DB10	0,33	0,33	0,33	0,33	4	0,33	0,00	1,00	94,68	
8	F13x	PD01	DB10	0,36	0,32	0,33	0,32	4	0,33	0,02	6,28	95,32	
9	A90	PD99	DB10	0,33	0,32	0,35	0,36	4	0,34	0,02	5,37	97,77	
10	F12x	PD01	DB10	0,33	0,34	0,35	0,35	4	0,34	0,01	2,25	99,06	
11	F32	PD01	DB10	0,34	0,35	0,37	0,36	4	0,35	0,01	3,60	101,43	
12	A82	PD01	DB10	0,36	0,39	0,35	0,38	4	0,37	0,02	5,08	106,65	
13	F07x	PD03	DB08	0,39	0,37	0,37	0,38	4	0,38	0,01	2,54	108,42	
14	A60x	PD01	DB10	0,41	0,749a	0,40	0,33	3	0,38	0,04	11,61	108,70	
15	F18x	PD99	DB10	0,37	0,38	0,40	0,38	4	0,38	0,01	3,04	108,91	
16	F08x	PD01	DB10	0,36	0,37	0,38	0,42	4	0,38	0,02	6,44	109,99	
17	F27	PD01	DB05	0,38	0,47	0,33	0,42	4	0,40	0,06	15,11	114,95	
18	F14	PC01	DB10	0,44	0,43	0,42	0,44	4	0,43	0,01	2,79	124,15	
19	A97	PD02	DB10	1,45	1,53	1,41	1,42	0	1,45	b *	0,05	3,74	417,67
20	F24	PD02	DB99	2,55	0,98	5,33	4,51	0	3,34	b *	1,96	58,63	961,15
21													
22													
23	F19x	PD02	DB08	<1,77	<1,49	<1,29	<1,31			**			
24	A49x	PC03	DB08	<1,2	<1,2	<1,2	<1,2			**			
25	F15x	PC01	DB09	<,5	<,5	<,5	<,5						
26	F06x	PD02	DB08	<,5	<,5	<,5	<,5						
27	F02	PD02	DB05	<,5	<,5	<,5	<,5						
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n Mean s_r CV_r
all labs 71 0,35 0,017 5,029

* = non tolerable mean because more than +/-

40 % from the mean

** = higher than maximum acceptable LOQ

Limit for the lower concentration range

l s_R CV_R
18 0,039 11,230

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: Pb

Sample: 3

Unit: µg/g

No.	Lab. Code	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery %
		P	D	1	2	3	4				s _i	V _i	
1	A47x	PD01	DB10	0,05	0,04	0,04	0,04	4	0,04		0,01	11,76	72,91
2	A45	PB99	DB10	0,05	0,05	0,05	0,05	4	0,05		0,00	5,30	80,97
3	F32	PD01	DB10	0,05	0,05	0,04	0,05	4	0,05		0,00	7,62	83,20
4	F16x	PC01	DB10	0,05	0,05	0,05	0,05	4	0,05		0,00	4,49	87,49
5	A36	PD02	DB10	0,05	0,05	0,05	0,05	4	0,05		0,00	2,77	87,49
6	A80	PD03	DB10	0,06	0,05	0,06	0,05	4	0,05		0,01	12,36	94,05
7	A90	PD99	DB10	0,05	0,05	0,06	0,05	4	0,06		0,01	10,18	94,35
8	F12x	PD01	DB10	0,05	0,06	0,06	0,06	4	0,06		0,00	5,62	96,54
9	F13x	PD01	DB10	0,06	0,06	0,07	0,05	4	0,06		0,01	12,36	105,24
10	A60x	PD01	DB10	0,06	0,06	0,06	0,06	4	0,06		0,00	3,16	108,54
11	F18x	PD99	DB10	0,06	0,06	0,06	0,07	4	0,06		0,01	8,81	109,44
12	F08x	PD01	DB10	0,06	0,07	0,08	0,07	4	0,07		0,01	13,07	114,93
13	A82	PD01	DB10	0,06	0,08	0,08	0,07	4	0,07		0,01	12,95	122,05
14	F33	PD01	DB10	0,09	0,09	0,08	0,09	4	0,08	*	0,01	6,68	142,81
15	F27	PD01	DB05	0,16	0,06	0,20	0,08	0	0,12	b *	0,07	53,07	210,57
16	F14	PC01	DB10	0,15	0,1486a	0,15	0,15	0	0,15	b *	0,00	0,00	256,63
17	F07x	PD03	DB08	0,26	0,25	0,23	0,27	0	0,25	b *	0,02	7,34	433,74
18	A97	PD02	DB10	1,03	1,12	1,08	0,98	0	1,05	b *	0,06	5,77	1805,48
19	F24	PD02	DB99	0,86	1,00	2,34	1,40	0	1,40	b *	0,67	47,65	2401,59
20													
21													
22	F19x	PD02	DB08	<1,29	<1,21	<1,76	<1,41			**			
23	A49x	PC03	DB08	<1,2	<1,2	<1,2	<1,2			**			
24	F15x	PC01	DB09	<,5	<,5	<,5	<,5						
25	F02	PD02	DB05	<,5	<,5	<,5	<,5						
26	F06x	PD02	DB08	<,5	<,5	<,5	<,5						
27	F05x	PD02	DB05	<,125	<,125	<,125	<,125						
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n Mean s_r CV_r
all labs **56** **0,06** **0,005** **8,474**

* = non tolerable mean because more than +/-

30 % from the mean

** = higher than maximum acceptable LOQ

Lower than the lowest evaluated result

l s_R CV_R
14 **0,011** **18,611**

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: Pb

Sample: 4

Unit: µg/g

No.	Lab. Code	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery %
		P	D	1	2	3	4				s _i	V _i	
1	F05x	PD02	DB05	0,84	0,82	0,81	0,80	0	0,82	b *	0,02	1,98	52,61
2	F33	PD01	DB10	1,20	1,21	1,20	1,22	4	1,21		0,01	0,69	77,64
3	F15x	PC01	DB09	1,22	1,30	1,24	1,17	4	1,23		0,05	4,36	79,42
4	F27	PD01	DB05	1,45	1,52	1,39	1,35	4	1,43		0,08	5,28	91,90
5	F16x	PC01	DB10	1,42	1,41	1,47	1,42	4	1,43		0,03	2,08	92,11
6	A60x	PD01	DB10	1,46	1,45	1,47	1,51	4	1,47		0,03	1,90	94,94
7	A80	PD03	DB10	1,48	1,44	1,46	1,52	4	1,48		0,03	2,32	95,04
8	A47x	PD01	DB10	1,50	1,45	1,54	1,47	4	1,49		0,04	2,63	96,01
9	A45	PB99	DB10	1,47	1,50	1,57	1,46	4	1,50		0,05	3,31	96,65
10	A36	PD02	DB10	1,49	1,55	1,47	1,54	4	1,51		0,04	2,41	97,36
11	A90	PD99	DB10	2,07a	1,56	1,53	1,51	3	1,53		0,03	1,64	98,80
12	F12x	PD01	DB10	1,58	1,59	1,64	1,60	4	1,60		0,02	1,56	103,37
13	F13x	PD01	DB10	1,73	1,58	1,60	1,51	4	1,61		0,09	5,72	103,42
14	F07x	PD03	DB08	1,64	1,60	1,61	1,61	4	1,61		0,02	1,13	104,03
15	F08x	PD01	DB10	1,57	1,67	1,66	1,64	4	1,63		0,05	2,81	105,16
16	F14	PC01	DB10	1,69	1,62	1,70	1,60	4	1,65		0,05	3,02	106,48
17	A82	PD01	DB10	1,74	1,69	1,53	1,66	4	1,66		0,09	5,40	106,64
18	F18x	PD99	DB10	1,74	1,68	1,70	1,73	4	1,71		0,03	1,61	110,34
19	F32	PD01	DB10	1,80	1,63	1,67	1,85	4	1,74		0,10	6,01	111,96
20	A49x	PC03	DB08	1,91	1,65	1,71	1,80	4	1,77		0,11	6,38	113,74
21	F06x	PD02	DB08	1,94	1,59	1,88	1,71	4	1,78		0,16	8,98	114,69
22	F02	PD02	DB05	2,08	2,09	2,10	2,13	0	2,10	b *	0,02	1,03	135,31
23	A97	PD02	DB10	2,71	2,96	2,68	2,38	0	2,68	b *	0,24	8,86	172,85
24	F24	PD02	DB99	8,19	6,76	3,40	6,96	0	6,33	b *	2,05	32,42	407,71
25													
26													
27	F19x	PD02	DB08	<1,48	1,38	<1,42	<1,53						
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n	Mean	s _r	CV _r
all labs 79	1,55	0,055	3,557

* = non tolerable mean because more than +/-

30 % from the mean

l	s _R	CV _R
20	0,157	10,116

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: Cd

Sample: 1

Unit: ng/g

No.	Lab. Code	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery %
		P	D	1	2	3	4				s _i	V _i	
1	A97	PD02	DB10	47,00	45,10	41,86	44,65	4	44,65	*	2,12	4,75	65,63
2	A47x	PD01	DB10	52,00	51,00	52,00	51,00	4	51,50		0,58	1,12	75,69
3	F06x	PD02	DB08	53,00	48,00	55,00	56,00	4	53,00		3,56	6,72	77,90
4	F02	PC02	DB05	59,00	60,00	61,00	63,00	4	60,75		1,71	2,81	89,29
5	F16x	PC01	DB10	63,22	61,97	63,36	62,58	4	62,78		0,64	1,02	92,27
6	F15x	PC01	DB09	86a	63,00	65,00	67,00	3	65,00		2,00	3,08	95,53
7	F12x	PD01	DB10	66,10	65,20	66,60	66,80	4	66,18		0,71	1,08	97,26
8	A90	PD99	DB10	69,24	68,24	67,77	64,05	4	67,33		2,27	3,37	98,95
9	A36	PD02	DB10	69,40	68,44	68,34	66,53	4	68,18		1,20	1,76	100,20
10	F08x	PD01	DB10	74,10	60,40	70,30	70,00	4	68,70		5,84	8,50	100,97
11	A80	PD03	DB10	68,70	69,40	68,80	68,70	4	68,90		0,34	0,49	101,27
12	A60x	PD01	DB10	67,29	81,83	67,70	62,31	4	69,78		8,40	12,03	102,56
13	F14	PC01	DB10	71,10	70,10	75,40	66,90	4	70,88		3,51	4,95	104,17
14	A45x	PE99	DB10	72,20	71,30	69,80	70,90	4	71,05		0,99	1,40	104,43
15	F18x	PD99	DB10	68,60	72,20	71,00	72,40	4	71,05		1,75	2,46	104,43
16	A82	PD01	DB10	69,92	70,77	73,56	71,93	4	71,55		1,58	2,20	105,15
17	F33	PD01	DB10	73,64	72,14	74,61	72,41	4	73,20		1,14	1,56	107,59
18	F27	PD01	DB05	64,79	67,43	77,07	83,73	4	73,26		8,75	11,95	107,67
19	A88	PD01	DB05	75,33	73,22	73,48	75,60	4	74,41		1,23	1,65	109,36
20	F13x	PD01	DB10	75,00	77,60	73,50	72,90	4	74,75		2,10	2,80	109,86
21	F32	PD01	DB10	79,30	86,70	85,60	85,60	4	84,30		3,37	4,00	123,90
22	F07x	PD03	DB08	85,07	84,10	86,57	83,95	4	84,92		1,21	1,42	124,81
23													
24													
25	A49x	PC03	DB08	<600	<600	<600	<600			**			
26	F19x	PD02	DB08	103,00	90,50	<100	112,00			*			
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n Mean s_r CV_r
all labs 87 68,04 2,499 3,673

* = non tolerable mean because more than +/-

30 % from the mean

** = higher than maximum acceptable LOQ

l s_R CV_R
22 9,442 13,884

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: Cd

Sample: 2

Unit: ng/g

No.	Lab. Code	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery %
		P	D	1	2	3	4				s _i	V _i	
1	A97	PD02	DB10	0,59	0,58	0,58	0,59	0	0,59	b *	0,01	0,99	3,17
2	A47x	PD01	DB10	15,00	14,00	14,00	14,00	4	14,25		0,50	3,51	77,30
3	F08x	PD01	DB10	16,77	13,19	15,17	18,92	4	16,01		2,43	15,19	86,85
4	F16x	PC01	DB10	17,04	17,19	16,65	17,17	4	17,01		0,25	1,47	92,28
5	A88	PD01	DB05	17,76	17,76	17,76	17,49	4	17,69		0,14	0,76	95,97
6	A60x	PD01	DB10	18,36	15,90	16,18	20,55	4	17,75		2,17	12,22	96,27
7	F27	PD01	DB05	13,25	14,97	17,20	26,54	0	17,99	c	5,92	32,93	97,58
8	F12x	PD01	DB10	18,30	19,00	17,80	19,40	4	18,63		0,71	3,83	101,03
9	A90	PD99	DB10	19,95	19,47	18,61	17,10	4	18,78		1,25	6,66	101,88
10	A36	PD02	DB10	18,86	18,75	18,54	19,60	4	18,94		0,46	2,44	102,72
11	A80	PD03	DB10	18,90	18,80	19,10	19,90	4	19,18		0,50	2,60	104,01
12	F33	PD01	DB10	18,81	19,24	19,70	19,57	4	19,33		0,40	2,05	104,85
13	F14	PC01	DB10	19,08	19,08	20,10	19,08	4	19,34		0,51	2,64	104,88
14	A82	PD01	DB10	18,99	20,07	19,11	19,27	4	19,36		0,49	2,52	105,01
15	A45x	PE99	DB10	20,00	18,70	18,80	20,10	4	19,40		0,75	3,88	105,23
16	F18x	PD99	DB10	18,30	19,30	21,10	20,40	4	19,78		1,23	6,23	107,27
17	F13x	PD01	DB10	21,80	21,50	21,20	19,90	4	21,10		0,84	3,97	114,45
18	F32	PD01	DB10	28,60	23,30	23,30	16,90	0	23,03	b	4,79	20,79	124,89
19	F07x	PD03	DB08	39,29	42,96	42,84	39,90	0	41,25	b *	1,92	4,67	223,74
20													
21													
22	A49x	PC03	DB08	<600	<600	<600	<600			**			
23	F19x	PD02	DB08	<100	<100	<90	<90			**			
24	F15x	PC01	DB09	<50	<50	<50	<50						
25	F02	PC02	DB05	<50	<50	<50	<50						
26	F06x	PD02	DB08	<40	<40	<40	<40						
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n	Mean	s _r	CV _r
all labs 60	18,44	0,842	4,566

* = non tolerable mean because more than +/-

30 % from the mean

** = higher than maximum acceptable LOQ

Lower than the lowest evaluated result

l	s _R	CV _R
15	1,684	9,133

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: Cd

Sample: 3

Unit: ng/g

No.	Lab. Code	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery %
		P	D	1	2	3	4				s _i	V _i	
1	A97	PD02	DB10	23,28	25,85	25,61	24,92	0	24,92	b *	1,16	4,65	50,29
2	A47x	PD01	DB10	33,00	34,00	34,00	35,00	0	34,00	b *	0,82	2,40	68,63
3	F16x	PC01	DB10	44,51	45,60	43,94	45,42	4	44,87		0,78	1,74	90,56
4	A90	PD99	DB10	49,16	45,39	43,82	47,59	4	46,49		2,36	5,07	93,84
5	F14	PC01	DB10	47,76	48,82	45,63	46,70	4	47,23		1,37	2,91	95,32
6	A36	PD02	DB10	48,23	47,38	47,06	48,23	4	47,73		0,60	1,25	96,33
7	A80	PD03	DB10	48,20	47,80	47,40	48,20	4	47,90		0,38	0,80	96,68
8	F12x	PD01	DB10	47,90	46,50	48,80	48,70	4	47,98		1,06	2,21	96,83
9	F18x	PD99	DB10	49,30	48,80	47,20	48,20	4	48,38		0,90	1,87	97,64
10	A45x	PE99	DB10	48,70	50,10	49,50	48,80	4	49,28		0,66	1,33	99,46
11	A82	PD01	DB10	50,02	50,34	50,26	50,14	4	50,19		0,14	0,28	101,30
12	F08x	PD01	DB10	50,98	52,18	47,60	53,45	4	51,05		2,51	4,92	103,05
13	F33	PD01	DB10	49,29	50,82	52,67	51,89	4	51,17		1,46	2,86	103,28
14	A60x	PD01	DB10	54,20	45,97	45,04	60,08	0	51,32	c	7,14	13,92	103,59
15	F32	PD01	DB10	50,10	52,60	51,40	53,90	4	52,00		1,63	3,13	104,96
16	F13x	PD01	DB10	54,40	54,80	50,60	51,10	4	52,73		2,18	4,14	106,42
17	F15x	PC01	DB09	50,00	53,00	50,00	58,00	4	52,75		3,77	7,16	106,47
18	F27	PD01	DB05	44,21	52,20	54,61	62,53	0	53,39	c	7,54	14,13	107,76
19	A88	PD01	DB05	52,05	54,16	53,11	54,43	4	53,44		1,09	2,03	107,86
20	F07x	PD03	DB08	64,17	71,24	70,31	69,87	0	68,90	b *	3,20	4,65	139,06
21													
22													
23	A49x	PC03	DB08	<600	<600	<600	<600			**			
24	F19x	PD02	DB08	<80	<100	<100	<100			**			
25	F02	PC02	DB05	<50	<50	<50	<50						
26	F06x	PD02	DB08	<40	<40	<40	<40						
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n Mean s_r CV_r
all labs **60** **49,54** **1,393** **2,812**

* = non tolerable mean because more than +/-

30 % from the mean

** = higher than maximum acceptable LOQ

l s_R CV_R
15 **2,583** **5,213**

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: Cd

Sample: 4

Unit: ng/g

No.	Lab. Code	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery %
		P	D	1	2	3	4				s _i	V _i	
1	A97	PD02	DB10	15,68a	16,48	16,55	16,42	0	16,48	b *	0,07	0,39	39,57
2	A47x	PD01	DB10	31,00	35,00	33,00	32,00	4	32,75		1,71	5,21	78,63
3	F16x	PC01	DB10	37,82	36,27	37,08	36,57	4	36,94		0,68	1,84	88,68
4	F08x	PD01	DB10	37,60	35,60	37,80	40,40	4	37,85		1,97	5,20	90,87
5	A90	PD99	DB10	36,29	38,12	40,99	38,82	4	38,56		1,94	5,04	92,56
6	F12x	PD01	DB10	39,00	42,00	40,40	39,90	4	40,33		1,26	3,12	96,81
7	A80	PD03	DB10	40,10	39,50	41,00	41,00	4	40,40		0,73	1,82	96,99
8	A36	PD02	DB10	40,91	41,34	40,70	39,96	4	40,73		0,58	1,42	97,78
9	A45x	PE99	DB10	40,50	41,10	41,50	41,80	4	41,23		0,56	1,36	98,97
10	F33	PD01	DB10	41,68	42,06	42,80	41,30	4	41,96		0,64	1,53	100,74
11	A82	PD01	DB10	44,19	43,93	43,25	42,91	4	43,57		0,59	1,36	104,60
12	A60x	PD01	DB10	42,87	38,63	48,15	47,28	4	44,23		4,39	9,93	106,20
13	F13x	PD01	DB10	44,10	44,90	43,60	44,80	4	44,35		0,61	1,38	106,48
14	F14	PC01	DB10	46,30	45,20	43,00	43,00	4	44,38		1,65	3,72	106,54
15	F18x	PD99	DB10	46,50	47,60	41,50	42,30	4	44,48		3,02	6,80	106,78
16	A88	PD01	DB05	46,71	48,33	48,87	40,50	4	46,10		3,85	8,34	110,68
17	F32	PD01	DB10	48,60	50,80	48,60	46,40	4	48,60		1,80	3,70	116,68
18	F27	PD01	DB05	56,02	57,74	56,54	59,53	0	57,46	b *	1,56	2,71	137,95
19	F07x	PD03	DB08	63,44	66,94	68,53	68,49	0	66,85	b *	2,39	3,58	160,50
20	F15x	PC01	DB09	91,00	95,00	88,00	90,00	0	91,00	b *	2,94	3,24	218,48
21													
22													
23	A49x	PC03	DB08	<600	<600	<600	<600			**			
24	F19x	PD02	DB08	<90	99,70	<100	<100			*			
25	F02	PC02	DB05	<50	<50	<50	<50						
26	F06x	PD02	DB08	<40	<40	<40	<40						
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n Mean s_r CV_r
all labs 64 41,65 1,624 3,899

* = non tolerable mean because more than +/- 30 % from the mean

** = higher than maximum acceptable LOQ

l s_R CV_R
16 3,925 9,423

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: B

Sample: 1

Unit: µg/g

No.	Lab. Code	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery %
		P	D	1	2	3	4				s _i	V _i	
1	A60x	PD01	DB10	1,40	0,75	1,07	0,76	0	1,00	b *	0,31	30,90	40,36
2	F05	PD02	DB08	1,51	1,49	1,48	1,50	0	1,50	b *	0,01	0,86	60,62
3	F08x	PZ99	DB08	2,22	2,17	1,82	1,79	4	2,00		0,23	11,41	80,99
4	F02x	PD02	DB08	2,52	2,04	2,02	1,97	4	2,14		0,26	12,01	86,67
5	F33	PD01	DB10	2,29	2,02	2,24	2,24	4	2,20		0,12	5,49	89,10
6	A90	PD99	DB10	2,34	2,29	2,31	2,18	4	2,28		0,07	3,06	92,45
7	F16x	PC01	DB10	2,34	2,30	2,35	2,32	4	2,33		0,02	0,98	94,38
8	F15x	PC01	DB09	2,50	2,10	2,40	2,40	4	2,35		0,17	7,37	95,29
9	A47x	PD01	DB10	2,22	2,40	2,41	2,37	4	2,35		0,09	3,76	95,29
10	F19x	PD02	DB08	2,49	2,33	2,16	2,58	4	2,39		0,18	7,74	96,91
11	A65	PD01	DB08	2,60	2,50	2,50	2,40	4	2,50		0,08	3,27	101,37
12	A36	PD02	DB08	2,64	2,41	2,55	2,47	4	2,52		0,10	3,96	102,08
13	A88	PD01	DB08	2,48	2,65	2,38	2,66	4	2,54		0,14	5,36	103,09
14	A80	PD03	DB10	2,58	2,56	2,53	2,52	4	2,55		0,03	1,08	103,29
15	F28	PD02	DB08	2,47	2,53	2,66	2,62	4	2,57		0,09	3,35	104,21
16	F14x	PC01	DB08	2,62	2,59	2,60	2,60	4	2,60		0,01	0,48	105,52
17	F32	PD01	DB08	2,71	2,67	2,66	2,75	4	2,70		0,04	1,52	109,38
18	F24x	PD02	DB99	2,46	2,46	3,30	2,74	0	2,74	c	0,40	14,45	111,10
19	F18x	PD99	DB08	2,84	2,85	2,81	2,84	4	2,84		0,02	0,61	114,95
20	F07x	PD03	DB08	3,18	3,00	3,14	3,01	4	3,08		0,09	2,97	125,04
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23	A49x	PC03	DB08	<3	<3	<3	<3			**			
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n Mean s_r CV_r
 all labs 68 2,47 0,102 4,146

* = non tolerable mean because more than +/-

30 % from the mean

** = higher than maximum acceptable LOQ

Limit for the lower concentration range

l s_R CV_R
 17 0,263 10,646

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: B

Sample: 2

Unit: µg/g

No.	Lab. Code	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery %
		P	D	1	2	3	4				s _i	V _i	
1	F08x	PZ99	DB08	34,42	34,46	33,425a	34,30	3	34,39		0,08	0,24	81,43
2	F33	PD01	DB10	34,94	35,42	36,17	36,21	4	35,69		0,62	1,72	84,48
3	F19x	PD02	DB08	37,80	42,90	41,20	36,80	0	39,68	c	2,86	7,20	93,93
4	A60x	PD01	DB10	38,94	41,12	38,47	41,53	4	40,02		1,53	3,83	94,74
5	F16x	PC01	DB10	39,96	42,49	37,17	41,22	4	40,21		2,27	5,66	95,20
6	A47x	PD01	DB10	41,40	40,50	40,50	39,80	4	40,55		0,66	1,62	96,00
7	F18x	PD99	DB08	40,90	40,70	40,50	40,20	4	40,58		0,30	0,74	96,06
8	A88	PD01	DB08	40,80	41,05	41,94	42,47	4	41,57		0,78	1,87	98,41
9	F28	PD02	DB08	42,01	41,17	41,67	42,53	4	41,85		0,57	1,37	99,07
10	F14x	PC01	DB08	42,50	42,60	42,40	42,70	4	42,55		0,13	0,30	100,74
11	F05	PD02	DB08	42,29	42,18	42,74	43,18	4	42,60		0,46	1,07	100,85
12	A90	PD99	DB10	43,02	43,45	42,48	41,66	4	42,65		0,77	1,81	100,98
13	F02x	PD02	DB08	43,00	43,50	41,10	43,40	4	42,75		1,12	2,62	101,21
14	F24x	PD02	DB99	40,98	41,98	45,32	42,76	4	42,76		1,86	4,34	101,23
15	A36	PD02	DB08	45,00	41,83	42,79	43,62	4	43,31		1,34	3,10	102,54
16	F15x	PC01	DB09	44,20	43,80	43,40	42,80	4	43,55		0,60	1,37	103,10
17	A65	PD01	DB08	44,00	44,50	43,20	44,00	4	43,93		0,54	1,22	103,99
18	A80	PD03	DB10	43,40	44,30	43,70	44,50	4	43,98		0,51	1,17	104,11
19	F32	PD01	DB08	45,80	46,70	45,80	46,20	4	46,13		0,43	0,93	109,20
20	A49x	PC03	DB08	46,33	46,44	47,10	45,65	4	46,38		0,59	1,28	109,80
21	F07x	PD03	DB08	49,9052a	49,18	49,16	49,03	3	49,12		0,08	0,16	116,30
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n Mean s_r CV_r
all labs **78** **42,24** **0,762** **1,804**

* = non tolerable mean because more than +/-

20 % from the mean

l s_R CV_R
20 **3,317** **7,856**

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: B

Sample: 3

Unit: µg/g

No.	Lab. Code	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery %
		P	D	1	2	3	4				s _i	V _i	
1	F08x	PZ99	DB08	14,21	14,13	14,71	14,63	0	14,42	b	0,29	2,03	80,71
2	A60x	PD01	DB10	15,71	15,20	15,13	15,36	4	15,35		0,26	1,68	85,91
3	F16x	PC01	DB10	16,36	16,40	16,43	16,71	4	16,48		0,16	0,97	92,21
4	F24x	PD02	DB99	14,57	16,71	17,86	18,01	0	16,79	c	1,59	9,46	93,96
5	F19x	PD02	DB08	17,10	17,20	18,00	15,50	4	16,95		1,05	6,18	94,87
6	F05	PD02	DB08	17,28	17,39	17,06	17,17	4	17,23		0,14	0,82	96,41
7	A90	PD99	DB10	17,80	17,53	17,52	17,66	4	17,63		0,13	0,75	98,66
8	F02x	PD02	DB08	17,90	17,70	17,80	17,30	4	17,68		0,26	1,49	98,93
9	A47x	PD01	DB10	17,50	17,60	18,00	17,70	4	17,70		0,22	1,22	99,07
10	A80	PD03	DB10	18,00	17,70	17,80	17,50	4	17,75		0,21	1,17	99,35
11	F14x	PC01	DB08	17,80	17,80	17,70	17,80	4	17,78		0,05	0,28	99,49
12	F33	PD01	DB10	16,74	17,07	18,93	18,70	4	17,86		1,11	6,24	99,96
13	A36	PD02	DB08	18,60	17,62	17,79	17,66	4	17,92		0,46	2,57	100,29
14	F28	PD02	DB08	18,15	17,77	18,17	17,65	4	17,94		0,26	1,47	100,38
15	F18x	PD99	DB08	18,10	17,90	17,90	18,10	4	18,00		0,12	0,64	100,75
16	F15x	PC01	DB09	18,00	18,30	17,80	18,50	4	18,15		0,31	1,71	101,59
17	A65	PD01	DB08	18,20	18,40	18,50	17,80	4	18,23		0,31	1,70	102,01
18	A88	PD01	DB08	18,79	17,31	20,00	17,60	4	18,43		1,23	6,67	103,13
19	A49x	PC03	DB08	18,97	18,94	19,31	19,45	4	19,17		0,25	1,31	107,29
20	F07x	PD03	DB08	19,48	19,50	19,28	19,27	4	19,38		0,13	0,65	108,48
21	F32	PD01	DB08	20,00	19,90	20,30	19,30	4	19,88		0,42	2,11	111,24
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n Mean s_r CV_r
all labs **76** **17,87** **0,373** **2,085**

* = non tolerable mean because more than +/-

20 % from the mean

l s_R CV_R
19 **1,006** **5,633**

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: B

Sample: 4

Unit: µg/g

No.	Lab. Code	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery %
		P	D	1	2	3	4				s _i	V _i	
1	F08x	PZ99	DB08	33,41	33,67	32,62	32,83	0	33,13	b *	0,49	1,48	75,43
2	A60x	PD01	DB10	38,63	39,77	41,81	40,63	4	40,21		1,34	3,34	91,55
3	A47x	PD01	DB10	41,80	41,00	42,40	41,90	4	41,78		0,58	1,39	95,11
4	F16x	PC01	DB10	43,33	42,02	41,61	40,48	4	41,86		1,18	2,81	95,30
5	F33	PD01	DB10	39,64	42,50	42,24	45,23	4	42,40		2,28	5,39	96,54
6	F24x	PD02	DB99	40,03	42,33	43,29	44,04	4	42,42		1,74	4,11	96,58
7	F18x	PD99	DB08	42,40	42,90	42,50	42,90	4	42,68		0,26	0,62	97,16
8	A80	PD03	DB10	43,60	43,40	44,50	43,60	4	43,78		0,49	1,12	99,66
9	F19x	PD02	DB08	44,40	43,50	44,10	43,20	4	43,80		0,55	1,25	99,72
10	F14x	PC01	DB08	43,80	43,90	43,80	43,80	4	43,83		0,05	0,11	99,78
11	A90	PD99	DB10	42,33	45,53	45,55	42,63	4	44,01		1,77	4,02	100,20
12	F28	PD02	DB08	43,74	43,94	43,73	44,81	4	44,06		0,51	1,16	100,30
13	A65	PD01	DB08	44,60	43,70	44,30	44,90	4	44,38		0,51	1,15	101,03
14	A88	PD01	DB08	41,65	44,10	46,38	46,68	4	44,70		2,34	5,23	101,78
15	F15x	PC01	DB09	44,60	44,30	37,7a	45,60	3	44,83		0,68	1,52	102,07
16	A36	PD02	DB08	45,92	44,14	44,67	45,22	4	44,99		0,76	1,69	102,42
17	F05	PD02	DB08	45,43	45,19	45,19	44,60	4	45,10		0,35	0,78	102,69
18	F02x	PD02	DB08	46,50	44,40	49,20	43,20	4	45,83		2,63	5,74	104,33
19	F32	PD01	DB08	46,00	46,20	46,40	46,00	4	46,15		0,19	0,41	105,07
20	A49x	PC03	DB08	48,33	48,03	47,44	48,08	4	47,97		0,38	0,79	109,22
21	F07x	PD03	DB08	53,54	53,14	53,30	54,15	0	53,53	b *	0,44	0,82	121,88
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n Mean s_r CV_r
all labs 75 43,92 0,980 2,230

* = non tolerable mean because more than +/-

20 % from the mean

l s_R CV_R
19 1,795 4,085

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: As

Sample: 1

Unit: ng/g

No.	Lab. Code	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery %
		P	D	1	2	3	4				s _i	V _i	
1	F32	PD01	DB04	7,29	7,29	9,62	9,20	4	8,35	*	1,24	14,80	62,64
2	A90	PD04	DB10	9,45	9,40	11,45	10,43	4	10,18		0,97	9,52	76,39
3	F33	PD01	DB10	11,63	11,18	11,46	11,03	4	11,33		0,27	2,39	84,96
4	F14	PC01	DB10	11,70	12,70	13,80	11,70	4	12,48		1,00	8,03	93,59
5	A36	PD02	DB10	12,73	12,95	13,48	11,78	4	12,74		0,71	5,58	95,54
6	F13x	PD01	DB10	13,40	12,80	13,50	12,80	4	13,13		0,38	2,88	98,47
7	F16x	PC01	DB10	14,02	12,17	14,60	13,52	4	13,58		1,04	7,64	101,86
8	F12x	PD01	DB10	15,70	15,90	12,80	14,80	4	14,80		1,42	9,57	111,03
9	A82	PD01	DB10	15,23	17,33	18,54	18,10	4	17,30		1,47	8,48	129,79
10	A80	PD03	DB10	18,90	19,70	19,70	19,40	4	19,43	*	0,38	1,94	145,73
11	A97	PD02	DB10	36,34	31,55	29,44	31,28	0	32,15	b *	2,94	9,16	241,21
12													
13													
14	A45x	PZ99	DB10	<20	<20	<20	<20						
15	F08x	PD01	DB10	<20	<20	<20	<20						
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n Mean s_r CV_r
all labs **40** **13,33** **0,886** **6,649**

* = non tolerable mean because more than +/-

30 % from the mean

Lower than the lowest evaluated result

l s_R CV_R
10 **3,249** **24,372**

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: As

Sample: 2

Unit: ng/g

No.	Lab. Code	Method code		Replications				n	Lab.mean	Lab.standard dev.		Recovery %
		P	D	1	2	3	4			s _i	V _i	
1	A90	PD04	DB10	54,60	58,68	56,95	60,43	4	57,67	2,49	4,32	83,25
2	F32	PD01	DB04	59,60	60,80	62,20	59,30	4	60,48	1,32	2,18	87,30
3	A45x	PZ99	DB10	67,30	65,40	66,30	64,40	4	65,85	1,24	1,88	95,06
4	F12x	PD01	DB10	69,60	59,00	64,50	70,80	4	65,98	5,39	8,17	95,24
5	F08x	PD01	DB10	67,26	71,10	60,83	65,80	4	66,25	4,24	6,41	95,64
6	F16x	PC01	DB10	67,88	63,78	71,14	66,38	4	67,30	3,07	4,57	97,15
7	F33	PD01	DB10	69,89	70,43	70,13	68,49	4	69,74	0,86	1,23	100,67
8	F14	PC01	DB10	67,80	73,10	73,20	72,10	4	71,55	2,55	3,56	103,29
9	F13x	PD01	DB10	74,10	75,70	67,80	69,50	4	71,78	3,73	5,20	103,62
10	A36	PD02	DB10	72,15	75,01	74,05	73,52	4	73,68	1,19	1,62	106,37
11	A82	PD01	DB10	76,64	72,09	73,38	76,08	4	74,55	2,17	2,91	107,62
12	A80	PD03	DB10	75,50	75,40	77,90	80,60	4	77,35	2,46	3,17	111,67
13	A97	PD02	DB10	71,30	81,65	82,11	78,35	4	78,35	4,99	6,37	113,11
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n	Mean	s _r	CV _r
all labs 52	69,27	2,747	3,965

* = non tolerable mean because more than +/-

20 % from the mean

l	s _R	CV _R
13	6,154	8,884

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: As

Sample: 3

Unit: ng/g

No.	Lab. Code	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery %
		P	D	1	2	3	4				s _i	V _i	
1	F32	PD01	DB04	9,51	11,90	10,10	10,60	4	10,53	*	1,02	9,67	56,66
2	A90	PD04	DB10	13,96	10,61	13,25	17,49	0	13,83	c	2,84	20,51	74,42
3	F12x	PD01	DB10	14,90	15,60	15,70	17,50	4	15,93		1,11	6,96	85,71
4	F13x	PD01	DB10	17,50	16,60	16,50	16,90	4	16,88		0,45	2,67	90,82
5	F16x	PC01	DB10	16,20	17,65	18,62	17,85	4	17,58		1,01	5,75	94,61
6	A82	PD01	DB10	17,54	17,72	18,04	17,09	4	17,60		0,40	2,25	94,71
7	A36	PD02	DB10	18,21	17,78	17,99	16,82	4	17,70		0,61	3,46	95,26
8	F33	PD01	DB10	17,43	18,71	18,40	17,51	4	18,01		0,64	3,55	96,94
9	A97	PD02	DB10	20,17	20,42	19,27	18,95	4	19,70		0,70	3,57	106,04
10	F14	PC01	DB10	21,20	21,20	21,20	20,20	4	20,95		0,50	2,39	112,75
11	F08x	PD01	DB10	22,98	22,98	22,37	21,14	4	22,37		0,87	3,88	120,39
12	A80	PD03	DB10	28,70	26,20	28,00	25,70	4	27,15	*	1,43	5,27	146,12
13													
14													
15	A45x	PZ99	DB10	<20	<20	<20	<20						
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	n	Mean	s _r	CV _r
all labs	44	18,58	0,794	4,275

* = non tolerable mean because more than +/- **30** % from the mean

Lower than the lowest evaluated result

l	s _R	CV _R
11	4,154	22,356

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: As

Sample: 4

Unit: ng/g

No.	Lab. Code	Method code		Replications				n	Lab.mean	Lab.standard dev.		Recovery %
		P	D	1	2	3	4			s _i	V _i	
1	A90	PD04	DB10	133,30	129,65	132,94	122,04	4	129,48	5,23	4,04	87,38
2	F32	PD01	DB04	132,00	135,00	132,00	132,00	4	132,75	1,50	1,13	89,59
3	A45x	PZ99	DB10	125,00	142,00	131,00	140,00	4	134,50	7,94	5,90	90,77
4	A82	PD01	DB10	138,30	142,50	145,70	144,30	4	142,70	3,21	2,25	96,30
5	A97	PD02	DB10	128,33	152,49	149,92	143,58	4	143,58	10,83	7,55	96,89
6	F33	PD01	DB10	143,07	143,27	145,04	143,90	4	143,82	0,89	0,62	97,06
7	F08x	PD01	DB10	142,07	141,01	144,08	151,38	4	144,64	4,67	3,23	97,61
8	F12x	PD01	DB10	145,60	146,50	155,00	145,10	4	148,05	4,67	3,15	99,91
9	A80	PD03	DB10	154,00	151,00	164,00	158,00	4	156,75	5,62	3,59	105,78
10	F16x	PC01	DB10	156,70	157,70	156,60	156,80	4	156,95	0,51	0,32	105,92
11	A36	PD02	DB10	157,49	162,59	166,84	157,81	4	161,18	4,43	2,75	108,77
12	F14	PC01	DB10	166,70	166,70	162,40	161,40	4	164,30	2,80	1,70	110,88
13	F13x	PD01	DB10	158,80	167,30	172,50	172,10	4	167,68	6,37	3,80	113,15
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15												
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n Mean s_r CV_r
all labs **52** **148,18** **4,513** **3,046**

* = non tolerable mean because more than +/-

20 % from the mean

l s_R CV_R
13 **12,305** **8,304**

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: Cr

Sample: 1

Unit: µg/g

No.	Lab. Code	Method code		Replications				n	Lab.mean	Lab.standard dev.		Recovery %
		P	D	1	2	3	4			s _i	V _i	
1	A97	PD02	DB10	2,20	2,13	2,29	2,22	4	2,21	0,07	2,98	82,69
2	A88	PD01	DB08	2,18	2,25	2,28	2,22	4	2,23	0,04	1,91	83,53
3	A80	PD03	DB10	2,22	2,43	2,39	2,34	4	2,35	0,09	3,89	87,74
4	F16x	PC01	DB10	2,38	2,46	2,49	2,51	4	2,46	0,06	2,24	92,05
5	A60x	PD01	DB10	2,62	2,32	2,47	2,52	4	2,48	0,12	4,98	92,85
6	F27	PD01	DB05	2,25	2,37	2,34	3,06	4	2,51	0,37	14,93	93,76
7	F12x	PD01	DB10	2,53	2,59	2,56	2,57	4	2,56	0,03	1,06	95,88
8	F19x	PD02	DB08	2,75	2,48	2,21	2,89	4	2,58	0,30	11,66	96,63
9	A36	PD02	DB10	2,68	2,55	2,69	2,57	4	2,62	0,07	2,77	98,09
10	F18x	PD99	DB10	2,65	2,74	2,61	2,73	4	2,68	0,06	2,35	100,37
11	F08x	PD01	DB10	2,66	2,72	2,78	2,72	4	2,72	0,05	1,77	101,84
12	F13x	PD01	DB10	2,59	2,72	2,87	2,74	4	2,73	0,11	4,19	102,12
13	A90	PD99	DB10	2,29	2,64	3,34	2,67	4	2,74	0,44	16,04	102,34
14	F14	PC01	DB10	2,86	2,80	2,84	2,63	4	2,78	0,10	3,76	104,11
15	F02x	PD02	DB08	2,86	2,65	2,99	2,63	4	2,78	0,17	6,22	104,11
16	F33	PD01	DB10	2,95	2,95	2,87	2,78	4	2,89	0,08	2,80	108,04
17	A47x	PD01	DB10	3,69	2,35	3,12	2,48	4	2,91	0,62	21,29	108,88
18	A49x	PC03	DB08	2,64	3,22	2,94	2,91	4	2,92	0,24	8,12	109,43
19	F32	PD01	DB10	3,01	3,00	3,01	2,90	4	2,98	0,05	1,80	111,50
20	A82	PD01	DB10	3,19	3,55	3,20	3,32	4	3,31	0,17	4,99	124,03
21	F03	PD02	DB08	3,95	4,04	4,08	3,82	0	3,97	b *	2,96	148,68
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n	Mean	s _r	CV _r
all labs 80	2,67	0,163	6,084
25	% from the mean		

* = non tolerable mean because more than +/-

l	s _R	CV _R
20	0,267	9,989

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: Cr

Sample: 2

Unit: µg/g

No.	Lab. Code	Method code		Replications				n	Lab.mean	Lab.standard dev.		Recovery %	
		P	D	1	2	3	4			s _i	V _i		
1	F19x	PD02	DB08	0,85	1,08	1,00	0,88	4	0,95	0,11	11,23	75,97	
2	A88	PD01	DB08	0,96	0,96	1,01	0,97	4	0,98	0,02	2,44	77,93	
3	F27	PD01	DB05	1,23	1,10	1,05	0,99	4	1,09	0,10	9,58	87,40	
4	A80	PD03	DB10	1,16	1,20	1,14	1,16	4	1,17	0,03	2,16	93,11	
5	A90	PD99	DB10	1,16	1,22	1,17	1,16	4	1,18	0,03	2,44	94,11	
6	F12x	PD01	DB10	1,15	1,21	1,22	1,19	4	1,19	0,03	2,45	95,37	
7	A60x	PD01	DB10	1,20	1,20	1,25	1,19	4	1,21	0,03	2,30	96,51	
8	A36	PD02	DB10	1,23	1,19	1,25	1,21	4	1,22	0,03	2,08	97,25	
9	F16x	PC01	DB10	1,22	1,26	1,19	1,24	4	1,23	0,03	2,21	98,09	
10	F18x	PD99	DB10	1,22	1,27	1,21	1,27	4	1,24	0,03	2,58	99,31	
11	F08x	PD01	DB10	1,30	1,23	1,27	1,24	4	1,26	0,03	2,46	100,87	
12	F33	PD01	DB10	1,22	1,23	1,36	1,24	4	1,26	0,07	5,19	100,91	
13	F02x	PD02	DB08	1,29	1,29	1,29	1,24	4	1,28	0,03	1,96	102,11	
14	A49x	PC03	DB08	1,31	1,29	1,33	1,35	4	1,32	0,03	1,91	105,44	
15	F13x	PD01	DB10	1,29	1,35	1,39	1,32	4	1,34	0,04	3,14	107,02	
16	F32	PD01	DB10	1,40	1,41	1,41	1,41	4	1,41	0,01	0,36	112,50	
17	F14	PC01	DB10	1,40	1,48	1,43	1,46	4	1,44	0,04	2,43	115,29	
18	A82	PD01	DB10	1,49	1,47	1,50	1,48	4	1,49	0,01	0,80	118,71	
19	A97	PD02	DB10	1,53	1,48	1,55	1,55	4	1,53	0,03	2,16	122,09	
20	A47x	PD01	DB10	1,90	2,10	2,89a	2,00	0	2,00	b *	0,10	5,00	159,85
21	F03	PD02	DB08	2,59	2,30	2,87	2,68	0	2,61	b *	0,24	9,11	208,83
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n Mean s_r CV_r
 all labs **76** **1,25** **0,037** **2,964**

* = non tolerable mean because more than +/-

25 % from the mean

l s_R CV_R
19 **0,152** **12,165**

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: Cr

Sample: 3

Unit: µg/g

No.	Lab. Code	Method code		Replications				n	Lab.mean	Lab.standard dev.		Recovery %
		P	D	1	2	3	4			s _i	V _i	
1	F33	PD01	DB10	0,61	0,69	0,58	0,66	4	0,64	0,05	8,23	84,77
2	A90	PD99	DB10	0,70	0,64	0,62	0,60	4	0,64	0,04	6,75	85,44
3	A80	PD03	DB10	0,63	0,65	0,70	0,64	4	0,65	0,03	4,41	87,21
4	A36	PD02	DB10	0,67	0,65	0,68	0,65	4	0,66	0,01	2,20	88,74
5	F12x	PD01	DB10	0,68	0,66	0,71	0,69	4	0,69	0,02	2,95	91,93
6	A60x	PD01	DB10	0,74	0,70	0,69	0,67	4	0,70	0,03	4,36	93,69
7	F08x	PD01	DB10	0,71	0,76	0,66	0,68	4	0,70	0,04	5,82	93,71
8	F27	PD01	DB05	0,65	0,55	0,86	0,76	4	0,70	0,13	19,10	93,81
9	A88	PD01	DB08	0,71	0,69	0,79	0,69	4	0,72	0,05	6,61	96,12
10	F13x	PD01	DB10	0,73	0,69	0,73	0,74	4	0,72	0,02	3,13	96,12
11	F16x	PC01	DB10	0,70	0,81	0,72	0,77	4	0,75	0,05	6,62	100,16
12	F19x	PD02	DB08	0,79	0,79	0,81	0,66	4	0,76	0,07	8,65	101,69
13	F18x	PD99	DB10	0,81	0,82	0,74	0,75	4	0,78	0,04	5,28	103,99
14	F32	PD01	DB10	0,82	0,78	0,76	0,80	4	0,79	0,03	3,27	105,46
15	A82	PD01	DB10	0,90	0,86	0,86	0,85	4	0,87	0,02	2,29	115,72
16	A49x	PC03	DB08	0,89	0,91	0,86	0,84	4	0,87	0,03	3,64	116,71
17	F14	PC01	DB10	0,95	0,87	0,91	0,90	4	0,91	0,03	3,43	120,91
18	A97	PD02	DB10	0,89	0,89	1,01	0,92	4	0,93	0,06	6,12	123,82
19	A47x	PD01	DB10	1,58	2,17	0,85	1,33	0	1,48	0,55	37,06	197,91
20	F03	PD02	DB08	2,47	2,36	2,60	2,56	0	2,50	0,11	4,23	333,27
21												
22												
23	F02x	PD02	DB08	<1	<1	<1	<1					
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n Mean s_r CV_r
all labs 72 0,75 0,042 5,615

* = non tolerable mean because more than +/-

35 % from the mean

Limit for the lower concentration range

l s_R CV_R
18 0,091 12,192

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: Cr

Sample: 4

Unit: µg/g

No.	Lab. Code	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery %
		P	D	1	2	3	4				s _i	V _i	
1	A97	PD02	DB10	2,56	2,81	2,54	2,61	4	2,63	*	0,12	4,70	63,59
2	F19x	PD02	DB08	3,20	3,13	2,78	2,74	4	2,96	*	0,24	7,97	71,63
3	F33	PD01	DB10	3,09	3,16	3,18	3,14	4	3,14		0,04	1,23	75,98
4	A80	PD03	DB10	3,74	3,54	3,65	3,67	4	3,65		0,08	2,27	88,25
5	F02x	PD02	DB08	3,86	3,87	3,49	3,70	4	3,73		0,18	4,77	90,19
6	A47x	PD01	DB10	3,86	4,08	3,15	4,02	4	3,78		0,43	11,34	91,34
7	A36	PD02	DB10	3,86	4,02	3,98	3,72	4	3,90		0,14	3,49	94,23
8	A88	PD01	DB08	3,69	3,65	4,41	4,05	4	3,95		0,36	9,00	95,51
9	F12x	PD01	DB10	4,04	4,04	3,95	4,01	4	4,01		0,04	1,03	97,02
10	A60x	PD01	DB10	4,20	4,09	4,17	4,33	4	4,20		0,10	2,38	101,49
11	F16x	PC01	DB10	4,15	4,02	4,80	4,35	4	4,33		0,34	7,89	104,71
12	F18x	PD99	DB10	4,44	4,13	4,39	4,41	4	4,34		0,14	3,30	105,00
13	F03	PD02	DB08	4,44	4,48	4,40	4,26	4	4,39		0,10	2,21	106,24
14	F08x	PD01	DB10	4,27	4,30	4,72	4,41	4	4,42		0,21	4,65	106,96
15	A90	PD99	DB10	4,81	4,83	4,64	3,95	4	4,56		0,41	9,08	110,20
16	F13x	PD01	DB10	4,54	4,38	4,70	4,63	4	4,56		0,14	2,97	110,31
17	F27	PD01	DB05	4,82	4,75	4,89	5,756a	3	4,82		0,07	1,49	116,54
18	A49x	PC03	DB08	4,97	5,09	5,46	4,65	4	5,04		0,33	6,64	121,89
19	F32	PD01	DB10	5,21	5,26	5,16	5,22	4	5,21	*	0,04	0,79	126,03
20	F14	PC01	DB10	5,43	5,35	5,54	4,70	4	5,25	*	0,38	7,19	127,04
21	A82	PD01	DB10	7,11	7,08	6,01	6,49	0	6,67	b *	0,52	7,86	161,32
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n Mean s_r CV_r
all labs 79 4,14 0,194 4,694

* = non tolerable mean because more than +/-

25 % from the mean

l s_R CV_R
20 0,709 17,112

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: Co

Sample: 1

Unit: µg/g

No.	Lab. Code	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery %
		P	D	1	2	3	4				s _i	V _i	
1	F03	PD02	DB08	0,33	0,33	0,30	0,35	0	0,33	b *	0,02	6,41	66,64
2	A90	PD99	DB10	0,45	0,47	0,47	0,45	4	0,46		0,01	2,51	93,03
3	F16x	PC01	DB10	0,47	0,46	0,47	0,46	4	0,46		0,00	0,99	93,64
4	A60x	PD01	DB10	0,47	0,46	0,47	0,4415d	3	0,47		0,00	0,73	94,38
5	F13x	PD01	DB10	0,46	0,46	0,48	0,48	4	0,47		0,01	2,61	94,95
6	A80	PD03	DB10	0,48	0,48	0,48	0,47	4	0,48		0,00	0,36	96,16
7	A45	PE99	DB10	0,48	0,48	0,47	0,49	4	0,48		0,01	1,12	97,07
8	F12x	PD01	DB10	0,49	0,48	0,47	0,50	4	0,49		0,01	2,57	98,46
9	A97	PD02	DB10	0,47	0,47	0,52	0,49	4	0,49		0,02	4,85	98,59
10	F08x	PD01	DB10	0,47	0,52	0,48	0,48	4	0,49		0,02	4,92	98,89
11	A36	PD02	DB10	0,49	0,49	0,50	0,48	4	0,49		0,01	2,37	99,15
12	A47x	PD01	DB10	0,50	0,50	0,51	0,49	4	0,50		0,01	1,46	101,73
13	F33	PD01	DB10	0,48	0,52	0,50	0,52	4	0,51		0,02	3,97	102,13
14	F32	PD01	DB10	0,54	0,53	0,55	0,53	4	0,54		0,01	1,86	108,35
15	F14	PC01	DB10	0,55	0,55	0,55	0,52	4	0,54		0,02	3,20	109,71
16	A82	PD01	DB10	0,55	0,56	0,56	0,55	4	0,56		0,00	0,70	112,34
17													
18													
19	A49x	PC03	DB08	<1,2	<1,2	<1,2	<1,2			**			
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n	Mean	s _r	CV _r
all labs 59	0,49	0,011	2,283
25	% from the mean		

* = non tolerable mean because more than +/-

** = higher than maximum acceptable LOQ

l	s _R	CV _R
15	0,030	5,979

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: Co

Sample: 2

Unit: µg/g

No.	Lab. Code	Method code		Replications				n	Lab.mean	Lab.standard dev.		Recovery %
		P	D	1	2	3	4			s _i	V _i	
1	A80	PD03	DB10	0,069	0,069	0,066	0,067	4	0,067	0,002	2,30	93,12
2	F16x	PC01	DB10	0,069	0,069	0,067	0,065	4	0,067	0,002	2,57	93,15
3	A60x	PD01	DB10	0,068	0,067	0,069	0,066	4	0,068	0,001	1,91	93,29
4	F12x	PD01	DB10	0,068	0,068	0,068	0,072	4	0,069	0,002	3,09	95,19
5	A45	PE99	DB10	0,069	0,071	0,067	0,069	4	0,069	0,002	2,86	95,36
6	F13x	PD01	DB10	0,067	0,065	0,073	0,073	4	0,070	0,004	5,67	96,33
7	A36	PD01	DB10	0,071	0,071	0,073	0,070	4	0,071	0,001	1,77	98,40
8	F33	PD01	DB10	0,069	0,071	0,077	0,072	4	0,072	0,003	4,71	99,78
9	A97	PD02	DB10	0,080	0,070	0,070	0,080	4	0,075	0,006	7,70	103,58
10	F08x	PD01	DB10	0,070	0,081	0,072	0,077	4	0,075	0,005	6,62	103,58
11	A90	PD99	DB10	0,076	0,077	0,075	0,077	4	0,076	0,001	1,26	105,30
12	F14	PC01	DB10	0,077	0,077	0,074	0,079	4	0,077	0,002	2,42	106,17
13	A82	PD01	DB10	0,077	0,078	0,078	0,080	4	0,078	0,001	1,45	108,00
14	F32	PD01	DB10	0,079	0,081	0,076	0,079	4	0,079	0,002	2,62	108,76
15	A47x	PD01	DB10	0,076	0,081	0,094	0,079	0	0,083	0,008	9,62	113,94
16												
17												
18	A49x	PC03	DB08	<1,2	<1,2	<1,2	<1,2					
19	F03	PD02	DB08	<,1	<,1	<,1	<,1					
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n Mean s_r CV_r
all labs **56** **0,07** **0,002** **3,358**

* = non tolerable mean because more than +/-

35 % from the mean

** = higher than maximum acceptable LOQ

Limit for the lower concentration range

l s_R CV_R
14 **0,004** **5,768**

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: Co

Sample: 3

Unit: µg/g

No.	Lab. Code	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery %
		P	D	1	2	3	4				s _i	V _i	
1	F03	PD02	DB08	0,25	0,25	0,25	0,22 σ	3	0,25		0,00	0,23	80,78
2	F13x	PD01	DB10	0,28	0,28	0,28	0,30	4	0,29		0,01	3,46	92,25
3	A90	PD99	DB10	0,28	0,29	0,29	0,29	4	0,29		0,00	1,74	92,65
4	A60x	PD01	DB10	0,29	0,29	0,29	0,29	4	0,29		0,00	1,03	93,27
5	A80	PD03	DB10	0,29	0,29	0,29	0,29	4	0,29		0,00	0,89	93,78
6	F16x	PC01	DB10	0,29	0,30	0,30	0,31	4	0,30		0,01	2,11	97,00
7	A45	PE99	DB10	0,30	0,30	0,31	0,30	4	0,30		0,00	0,73	97,56
8	F12x	PD01	DB10	0,31	0,30	0,31	0,30	4	0,31		0,01	2,39	98,30
9	A36	PD02	DB10	0,31	0,30	0,32	0,30	4	0,31		0,01	2,44	99,66
10	A47x	PD01	DB10	0,32	0,33	0,31	0,31	4	0,32		0,01	2,74	101,91
11	F08x	PD01	DB10	0,32	0,33	0,31	0,32	4	0,32		0,01	2,45	103,28
12	F33	PD01	DB10	0,33	0,32	0,33	0,34	4	0,33		0,01	2,72	106,42
13	F32	PD01	DB10	0,34	0,33	0,33	0,34	4	0,33		0,01	1,57	106,99
14	A82	PD01	DB10	0,35	0,35	0,35	0,35	4	0,35		0,00	0,33	113,56
15	A97	PD02	DB10	0,33	0,36	0,37	0,36	0	0,36	c	0,02	4,88	114,40
16	F14	PC01	DB10	0,37	0,36	0,37	0,37	4	0,37		0,00	0,93	117,78
17													
18													
19	A49x	PC03	DB08	<1,2	<1,2	<1,2	<1,2			**			
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n Mean s_r CV_r
all labs 59 0,31 0,005 1,714

* = non tolerable mean because more than +/-

25 % from the mean

l s_R CV_R
15 0,029 9,245

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: Co

Sample: 4

Unit: µg/g

No.	Lab. Code	Method code		Replications				n	Lab.mean	Lab.standard dev.		Recovery %	
		P	D	1	2	3	4			s _i	V _i		
1	A45	PE99	DB10	0,13a	0,14	0,14	0,14	3	0,14	0,00	0,70	89,75	
2	F33	PD01	DB10	0,14	0,15	0,14	0,15	4	0,15	0,01	4,18	91,01	
3	F16x	PC01	DB10	0,15	0,14	0,15	0,15	4	0,15	0,00	3,16	92,80	
4	A80	PD03	DB10	0,14	0,15	0,15	0,15	4	0,15	0,00	2,23	93,05	
5	A60x	PD01	DB10	0,15	0,14	0,15	0,16	4	0,15	0,01	4,58	93,77	
6	F12x	PD01	DB10	0,15	0,15	0,16	0,16	4	0,15	0,00	2,90	96,16	
7	A36	PD01	DB10	0,15	0,16	0,15	0,15	4	0,15	0,00	2,87	96,97	
8	A47x	PD01	DB10	0,15	0,16	0,16	0,16	4	0,16	0,00	2,82	98,86	
9	A97	PD02	DB10	0,16	0,15	0,16	0,16	4	0,16	0,01	3,17	98,86	
10	A90	PD99	DB10	0,21	0,16	0,14	0,14	0	0,16	c	0,03	20,33	101,99
11	F08x	PD01	DB10	0,15	0,16	0,18	0,16	4	0,16	0,01	6,39	102,46	
12	F13x	PD01	DB10	0,17	0,17	0,17	0,16	4	0,17	0,00	2,03	104,19	
13	F32	PD01	DB10	0,16	0,17	0,17	0,18	4	0,17	0,01	3,82	108,43	
14	F14	PC01	DB10	0,18	0,19	0,18	0,18	4	0,18	0,01	4,28	114,39	
15	A82	PD01	DB10	0,19	0,19	0,19	0,19	4	0,19	0,00	0,42	116,74	
16													
17													
18	A49x	PC03	DB08	<1,2	<1,2	<1,2	<1,2			**			
19	F03	PD02	DB08	<,1	<,1	<,1	<,1			*			
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n	Mean	s _r	CV _r
all labs 55	0,16	0,005	3,102
25	% from the mean		

* = non tolerable mean because more than +/-

** = higher than maximum acceptable LOQ

l	s _R	CV _R
14	0,013	8,487

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: Hg

Sample: 1

Unit: ng/g

No.	Lab. Code	Method code		Replications				n	Lab.mean	Lab.standard dev.		Recovery %	
		P	D	1	2	3	4			s _i	V _i		
1	A90	PD99	DB10	7,81	7,72	5,85	7,27	4	7,16	0,91	12,65	88,00	
2	F12x	PD01	DB10	7,39	7,08	6,89	7,46	4	7,21	0,27	3,71	88,52	
3	F28	PZ98	DA05	7,80	7,60	7,40	7,80	4	7,65	0,19	2,50	93,99	
4	F13x	PZ98	DA05	7,75	7,75	7,85	7,75	4	7,78	0,05	0,64	95,52	
5	F32	PZ98	DA05	8,14	7,82	8,35	7,51	4	7,96	0,37	4,63	97,74	
6	F16x	PC01	DB10	8,17	7,70	8,56	8,04	4	8,12	0,36	4,37	99,70	
7	F03	PZ98	DA05	8,12	8,25	8,07	8,19	4	8,16	0,08	0,97	100,22	
8	F14	PC01	DB03	8,25	8,50	8,50	7,44	4	8,17	0,50	6,15	100,41	
9	F18x	PZ98	DA05	8,76	8,52	7,93	7,84	4	8,26	0,45	5,43	101,51	
10	A82	PZ98	DA05	8,26	8,52	8,37	8,09	4	8,31	0,18	2,18	102,11	
11	A36	PD02	DB03	9,23	9,44	9,02	9,66	4	9,34	0,28	2,95	114,72	
12	A80	PZ98	DA05	9,34	9,15	10,01	9,77	4	9,57	0,39	4,11	117,55	
13	A60x	PD01	DB10	9,88	11,46	11,00	11,43	0	10,94	b *	0,74	134,45	
14	F08x	PD01	DB03	14,19	17,54	11,87	14,53	0	14,53	b *	2,33	16,00	178,53
15	A97	PD02	DB10	19,77	22,16	18,84	17,97	0	19,69	b *	1,81	9,18	241,85
16	F24x	PZ98	DA05	64,00	75,00	87,00	68,00	0	73,50	b *	10,08	13,72	903,03
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19	F02x	PZ98	DA05	<10	<10	<10	<10						
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n Mean s_r CV_r
all labs **48** **8,14** **0,335** **4,113**

* = non tolerable mean because more than +/-

30 % from the mean

Lower than the lowest evaluated result

l s_R CV_R
12 **0,723** **8,887**

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: Hg

Sample: 2

Unit: ng/g

No.	Lab. Code	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery %
		P	D	1	2	3	4				s _i	V _i	
1	A97	PD02	DB10	8,19	9,92	8,10	8,64	0	8,71	b *	0,84	9,63	41,11
2	F08x	PD01	DB03	16,37	14,33	14,91	12,76	4	14,59	*	1,49	10,22	68,84
3	A90	PD99	DB10	15,91	21,45	17,55	17,23	4	18,04		2,38	13,22	85,10
4	F12x	PD01	DB10	19,14	18,55	20,32	19,40	4	19,35		0,74	3,81	91,32
5	F16x	PC01	DB10	19,76	20,32	20,36	20,30	4	20,19		0,28	1,41	95,25
6	F28	PZ98	DA05	20,10	20,50	19,90	20,30	4	20,20		0,26	1,28	95,32
7	F13x	PZ98	DA05	20,30	20,30	20,40	20,80	4	20,45		0,24	1,16	96,50
8	F14	PC01	DB03	20,10	20,10	21,20	21,20	4	20,65		0,64	3,08	97,44
9	F02x	PZ98	DA05	20,60	21,20	20,80	21,50	4	21,03		0,40	1,92	99,21
10	F03	PZ98	DA05	21,70	21,71	21,86	21,80	4	21,77		0,08	0,35	102,71
11	F18x	PZ98	DA05	22,20	21,90	22,20	21,60	4	21,98		0,29	1,31	103,69
12	A36	PD02	DB03	22,99	22,04	21,93	22,35	4	22,33		0,48	2,13	105,36
13	A82	PZ98	DA05	23,39	22,55	23,78	23,39	4	23,28		0,52	2,23	109,84
14	A60x	PD01	DB10	23,73	24,17	23,77	24,69	4	24,09		0,44	1,85	113,67
15	A80	PZ98	DA05	23,16	23,14	26,53	26,61	4	24,86		1,97	7,94	117,31
16	F32	PZ98	DA05	25,30	25,20	24,90	25,00	4	25,10		0,18	0,73	118,44
17	F24x	PZ98	DA05	233,00	245,00	246,00	265,00	0	247,25	b *	13,23	5,35	1166,70
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n Mean s_r CV_r
all labs 60 21,19 0,693 3,269

* = non tolerable mean because more than +/- 30 % from the mean

Limit for the lower concentration range

l s_R CV_R
15 2,719 12,831

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: Hg

Sample: 3

Unit: ng/g

No.	Lab. Code	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery %
		P	D	1	2	3	4				s _i	V _i	
1	A97	PD02	DB10	5,61	6,07	5,67	4,96	0	5,58	b *	0,46	8,24	51,64
2	A90	PD99	DB10	8,44	10,37	6,43	7,63	4	8,22		1,66	20,15	76,09
3	F14	PC01	DB03	9,55	9,55	9,55	9,55	4	9,55		0,00	0,00	88,43
4	F12x	PD01	DB10	9,83	10,00	10,60	10,10	4	10,13		0,33	3,28	93,81
5	F13x	PZ98	DA05	10,50	10,30	10,30	10,40	4	10,38		0,10	0,92	96,06
6	F28	PZ98	DA05	10,30	10,50	10,30	10,40	4	10,38		0,10	0,92	96,06
7	F18x	PZ98	DA05	10,40	10,80	10,10	10,40	4	10,43		0,29	2,76	96,53
8	F02x	PZ98	DA05	10,90	11,10	10,60	10,90	4	10,88		0,21	1,90	100,69
9	F16x	PC01	DB10	11,32	11,17	10,90	10,58	4	10,99		0,33	2,96	101,78
10	F32	PZ98	DA05	11,00	11,20	11,00	11,10	4	11,08		0,10	0,86	102,55
11	F03	PZ98	DA05	11,17	11,08	11,08	11,18	4	11,13		0,05	0,49	103,03
12	A36	PD02	DB03	11,71	11,92	11,82	11,50	4	11,74		0,18	1,53	108,68
13	A80	PZ98	DA05	11,74	11,69	12,88	12,86	4	12,29		0,67	5,43	113,82
14	A60x	PD01	DB10	13,81	14,17	14,13	16,9028a	3	14,04		0,19	1,39	129,96
15	A82	PZ98	DA05	36,74	35,96	37,67	35,69	0	36,52	b *	0,89	2,44	338,10
16	F24x	PZ98	DA05	99,00	99,00	104,00	123a	0	100,67	b *	2,89	2,87	932,09
17													
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19	F08x	PD01	DB03	<10	<10	<10	<10						
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n Mean s_r CV_r
all labs 51 10,80 0,322 2,985

* = non tolerable mean because more than +/-

30 % from the mean

Limit for the lower concentration range

l s_R CV_R
13 1,382 12,726

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: Hg

Sample: 4

Unit: ng/g

No.	Lab. Code	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery %
		P	D	1	2	3	4				s _i	V _i	
1	A97	PD02	DB10	4,83	5,08	4,95	4,45	0	4,83	b *	0,27	5,63	15,41
2	A82	PZ98	DA05	11,40	12,20	12,00	11,30	0	11,73	b *	0,44	3,77	37,44
3	A90	PD99	DB10	25,37	23,46	23,52	23,89	4	24,06		0,89	3,71	76,82
4	F08x	PD01	DB03	27,36	25,58	23,16	21,73	4	24,46		2,51	10,24	78,10
5	F12x	PD01	DB10	28,40	28,69	29,49	28,70	4	28,82		0,47	1,62	92,02
6	F14	PC01	DB03	29,05	29,05	29,05	29,05	4	29,05		0,00	0,00	92,75
7	F28	PZ98	DA05	30,00	29,90	30,50	30,30	4	30,18		0,28	0,91	96,35
8	F13x	PZ98	DA05	30,20	30,20	30,30	30,50	4	30,30		0,14	0,47	96,74
9	F02x	PZ98	DA05	29,90	31,20	31,00	31,90	4	31,00		0,83	2,67	98,98
10	A60x	PD01	DB10	34,26	33,77	33,11	30,31	4	32,86		1,76	5,37	104,92
11	F03	PZ98	DA05	33,07	32,97	32,69	32,85	4	32,90		0,16	0,50	105,03
12	F16x	PC01	DB10	32,08	35,01	30,87	33,83	4	32,95		1,83	5,57	105,20
13	F18x	PZ98	DA05	33,00	33,20	32,30	33,90	4	33,10		0,66	1,99	105,69
14	A36	PD02	DB03	35,07	32,20	31,14	34,54	4	33,24		1,87	5,64	106,12
15	A80	PZ98	DA05	33,37	33,36	38,49	38,15	4	35,84		2,86	7,99	114,44
16	F32	PZ98	DA05	39,80	40,00	39,70	39,40	4	39,73		0,25	0,63	126,84
17	F24x	PZ98	DA05	340,00	341,00	356,00	377,00	0	353,50	b *	17,29	4,89	1128,69
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n Mean s_r CV_r
all labs **56** **31,32** **1,037** **3,312**

* = non tolerable mean because more than +/-

30 % from the mean

Limit for the lower concentration range

l s_R CV_R
14 **4,105** **13,107**

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: Ni

Sample: 1

Unit: µg/g

No.	Lab. Code	Method code		Replications				n	Lab.mean	Lab.standard dev.		Recovery %
		P	D	1	2	3	4			s _i	V _i	
1	F19x	PD02	DB08	7,67	6,92	6,47	8,14	0	7,30	0,75	10,24	90,29
2	F13x	PD01	DB10	7,55	7,33	7,65	7,75	4	7,57	0,18	2,37	93,63
3	F16x	PC01	DB10	7,64	7,52	7,73	7,53	4	7,60	0,10	1,27	94,06
4	F12x	PD01	DB10	7,72	7,54	7,41	7,87	4	7,63	0,20	2,61	94,41
5	F08x	PD01	DB10	7,63	7,62	7,95	7,53	4	7,68	0,18	2,40	95,05
6	A60x	PD01	DB10	7,60	7,66	7,75	7,79	4	7,70	0,09	1,13	95,20
7	A97	PC02	DB10	7,82	7,64	7,64	7,70	4	7,70	0,08	1,10	95,24
8	F02x	PD02	DB08	8,80	7,40	7,50	7,60	4	7,83	0,66	8,37	96,79
9	A80	PD03	DB10	8,00	7,78	7,81	7,92	4	7,88	0,10	1,29	97,44
10	A90	PD99	DB10	7,58	7,86	8,58	7,64	4	7,92	0,46	5,80	97,90
11	A36	PD02	DB10	7,95	7,91	7,92	8,04	4	7,96	0,06	0,74	98,40
12	F18x	PD99	DB10	8,02	7,99	8,16	7,97	4	8,04	0,09	1,07	99,38
13	F03	PD02	DB08	8,00	7,99	8,08	8,24	4	8,08	0,12	1,43	99,88
14	F27	PD01	DB05	7,91	8,08	8,17	8,24	4	8,10	0,14	1,77	100,17
15	A49x	PC03	DB08	8,21	8,16	8,07	8,00	4	8,11	0,10	1,18	100,32
16	F33	PD01	DB10	8,30	8,17	8,32	8,37	4	8,29	0,09	1,03	102,54
17	A47x	PD01	DB10	8,38	9,18	8,60	7,80	4	8,49	0,57	6,72	105,01
18	F05	PD02	DB08	8,50	8,50	8,63	8,51	4	8,54	0,06	0,74	105,57
19	A82	PD01	DB10	8,65	8,85	8,84	8,79	4	8,78	0,09	1,04	108,62
20	F14	PC01	DB10	9,04	8,92	8,81	8,43	4	8,80	0,26	3,00	108,85
21	F32	PD01	DB10	9,12	8,80	9,39	8,76	4	9,02	0,30	3,28	111,54
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n Mean s_r CV_r
all labs **80** **8,08** **0,196** **2,422**

* = non tolerable mean because more than +/-

20 % from the mean

l s_R CV_R
20 **0,435** **5,379**

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: Ni

Sample: 2

Unit: µg/g

No.	Lab. Code	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery %
		P	D	1	2	3	4				s _i	V _i	
1	F19x	PD02	DB08	0,60	0,79	0,70	0,63	4	0,68	*	0,08	12,38	67,67
2	A49x	PC03	DB08	0,80	0,74	0,90	0,78	4	0,80		0,07	8,71	80,01
3	F33	PD01	DB10	0,82	0,82	0,82	0,97	4	0,86		0,08	8,75	85,33
4	F12x	PD01	DB10	0,86	0,87	0,88	0,87	4	0,87		0,01	0,97	86,53
5	F05	PD02	DB08	0,89	0,98	0,85	0,96	4	0,92		0,06	6,51	91,55
6	A36	PD02	DB10	1,05	0,90	0,99	0,86	4	0,95		0,09	9,05	94,61
7	F27	PD01	DB05	0,84	0,96	1,04	0,97	4	0,95		0,08	8,64	94,88
8	A80	PD03	DB10	0,99	0,95	0,94	0,96	4	0,96		0,02	2,20	95,33
9	F03	PD02	DB08	1,02	1,02	0,99	0,85	4	0,97		0,08	8,52	96,35
10	F08x	PD01	DB10	0,97	1,05	0,86	1,01	4	0,97		0,08	8,44	96,48
11	F18x	PD99	DB10	1,04	0,93	0,97	0,97	4	0,98		0,05	4,80	97,30
12	A90	PD99	DB10	1,09	1,06	0,90	0,90	4	0,99		0,10	10,31	98,27
13	F13x	PD01	DB10	1,04	1,04	0,98	1,09	4	1,04		0,04	4,17	103,34
14	F14	PC01	DB10	1,07	1,16	1,06	1,06	4	1,09		0,05	4,47	108,22
15	F16x	PC01	DB10	1,07	1,26	1,12	1,15	4	1,15		0,08	7,19	114,36
16	A82	PD01	DB10	1,64	1,01	1,14	0,96	4	1,19		0,31	26,39	118,25
17	A97	PC02	DB10	1,23	1,20	1,29	1,19	4	1,23	*	0,05	3,67	122,15
18	F32	PD01	DB10	1,51	1,20	1,24	1,06	4	1,25	*	0,19	15,03	124,64
19	A60x	PD01	DB10	1,19	0,98	1,28	1,57	4	1,25	*	0,24	19,27	124,73
20	A47x	PD01	DB10	1,37	1,49	2,10	2,07	0	1,76	b *	0,38	21,71	174,89
21													
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23	F02x	PD02	DB08	1,10	1,30	<1	1,10						
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n Mean s_r CV_r
all labs 76 1,005 0,093 9,234

* = non tolerable mean because more than +/-

20 % from the mean

l s_R CV_R
19 0,156 15,552

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: Ni

Sample: 3

Unit: µg/g

No.	Lab. Code	Method code		Replications				n	Lab.mean	Lab.standard dev.		Recovery %
		P	D	1	2	3	4			s _i	V _i	
1	F19x	PD02	DB08	3,67	3,74	3,94	3,31	4	3,67	0,26	7,17	87,34
2	F13x	PD01	DB10	3,59	3,62	3,89	3,96	4	3,77	0,19	4,98	89,73
3	F12x	PD01	DB10	3,88	3,71	3,94	3,81	4	3,84	0,10	2,53	91,42
4	A60x	PD01	DB10	3,97	3,77	3,94	3,89	4	3,89	0,09	2,30	92,78
5	A90	PD99	DB10	3,84	3,86	3,87	4,10	4	3,92	0,12	3,12	93,36
6	A36	PD02	DB10	4,01	3,91	4,07	3,96	4	3,99	0,07	1,67	94,99
7	F27	PD01	DB05	4,04	4,12	3,93	3,88	4	3,99	0,11	2,66	95,19
8	F08x	PD01	DB10	3,90	4,05	4,01	4,07	4	4,01	0,07	1,81	95,49
9	A80	PD03	DB10	3,98	4,08	3,93	4,04	4	4,01	0,07	1,65	95,51
10	F16x	PC01	DB10	4,38	4,03	4,11	4,15	4	4,17	0,15	3,55	99,30
11	F18x	PD99	DB10	4,18	4,23	4,13	4,17	4	4,18	0,04	0,98	99,56
12	F03	PD02	DB08	4,19	4,20	4,17	4,18	4	4,19	0,02	0,36	99,79
13	A49x	PC03	DB08	3,94	3,92	4,21	4,85	4	4,23	0,43	10,21	100,80
14	F05	PD02	DB08	4,35	4,34	4,45	4,34	4	4,37	0,05	1,23	104,14
15	A82	PD01	DB10	4,37	4,43	4,43	4,40	4	4,41	0,03	0,69	105,01
16	F33	PD01	DB10	4,26	4,26	4,55	4,63	4	4,43	0,19	4,37	105,46
17	F32	PD01	DB10	4,47	4,58	4,45	4,55	4	4,51	0,06	1,38	107,54
18	A47x	PD01	DB10	4,70	4,97	4,16	4,37	4	4,55	0,36	7,86	108,43
19	F02x	PD02	DB08	4,70	5,00	4,20	5,50	0	4,85	0,54	11,23	115,58
20	F14	PC01	DB10	4,96	4,91	4,89	4,82	4	4,90	0,06	1,19	116,66
21	A97	PC02	DB10	5,00	4,91	4,87	4,94	4	4,93	0,05	1,11	117,49
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n Mean s_r CV_r
all labs **80** **4,20** **0,126** **2,998**

* = non tolerable mean because more than +/-

20 % from the mean

l s_R CV_R
20 **0,348** **8,300**

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Element: Ni

Sample: 4

Unit: µg/g

No.	Lab. Code	Method code		Replications				n	Lab.mean	*	Lab.standard dev.		Recovery %
		P	D	1	2	3	4				s _i	V _i	
1	F33	PD01	DB10	1,82	1,86	2,07	1,79	4	1,89	*	0,13	6,72	73,36
2	A97	PC02	DB10	2,03	1,84	2,07	1,99	4	1,98	*	0,10	5,07	77,15
3	F19x	PD02	DB08	2,11	2,08	1,84	1,99	4	2,01	*	0,12	6,05	78,03
4	F03	PD02	DB08	2,05	2,17	2,23	2,40	4	2,21		0,15	6,66	86,02
5	A36	PD02	DB10	2,29	2,39	2,42	2,29	4	2,35		0,07	3,00	91,28
6	F02x	PD02	DB08	2,30	2,40	2,30	2,40	4	2,35		0,06	2,46	91,45
7	F05	PD02	DB08	2,45	2,47	2,44	2,29	4	2,41		0,08	3,42	93,89
8	A47x	PD01	DB10	2,38	2,70	2,10	2,49	4	2,42		0,25	10,34	94,08
9	F12x	PD01	DB10	2,41	2,43	2,45	2,43	4	2,43		0,02	0,67	94,47
10	F27	PD01	DB05	2,55	2,42	2,45	2,37	4	2,45		0,08	3,11	95,29
11	A80	PD03	DB10	2,55	2,41	2,86	2,52	4	2,59		0,19	7,46	100,60
12	A60x	PD01	DB10	2,59	2,64	2,63	2,79	4	2,67		0,09	3,29	103,71
13	F18x	PD99	DB10	2,77	2,64	2,69	2,74	4	2,71		0,06	2,11	105,46
14	F16x	PC01	DB10	2,58	2,57	3,03	2,66	4	2,71		0,22	7,93	105,52
15	F08x	PD01	DB10	2,73	2,90	2,73	2,73	4	2,77		0,09	3,11	107,91
16	A49x	PC03	DB08	2,60	2,93	3,09	2,66	4	2,82		0,23	8,08	109,72
17	F13x	PD01	DB10	2,96	2,74	2,83	2,84	4	2,84		0,09	3,18	110,62
18	A90	PD99	DB10	2,71	3,16	3,00	2,51	4	2,85		0,29	10,22	110,72
19	A82	PD01	DB10	2,85	2,99	2,75	3,19	4	2,94		0,19	6,44	114,56
20	F32	PD01	DB10	3,20	3,20	3,14	3,21	4	3,19	*	0,03	1,00	124,05
21	F14	PC01	DB10	3,09	3,60	3,42	3,47	4	3,40	*	0,22	6,39	132,12
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n Mean s_r CV_r
all labs **84** **2,57** **0,130** **5,069**

* = non tolerable mean because more than +/-

20 % from the mean

l s_R CV_R
21 **0,384** **14,943**

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Additional parameters

Element	Unit	Sample no.	Lab no.	Method code		Replicates				Mean	Si	Vi
				P	D	1	2	3	4			
Ag	(ng/g)	1	A80	PD03	DB10	5,31	5,23	5,18	5,47	5,30	0,127	2,395
Ag	(ng/g)	2	A80	PD03	DB10	3,12	2,55	4,03	4,94	3,66	1,049	28,652
Ag	(ng/g)	3	A80	PD03	DB10	6,61	7,5	6,62	6,72	6,86	0,428	6,235
Ag	(ng/g)	4	A80	PD03	DB10	10,7	10,1	10,1	10	10,23	0,320	3,131
Al	(µg/g)	1	F19x	PD02	DB08	46,4	41,4	39,7	47,6	43,78	3,820	8,725
			A80	PD03	DB10	44,1	44,9	44,9	45,2	44,78	0,472	1,053
			A60	PD01	DB10	50,65	45,22	49,23	47,87	48,24	2,313	4,794
			F18x	PD99	DB08	49,5	49,4	49,6	49,4	49,48	0,096	0,194
			A36	PD02	DB08	52,02	51,8	48,92	49,78	50,63	1,522	3,006
			F12x	PD01	DB08	52,9	50,5	49,4	49,9	50,68	1,550	3,059
			F28	PD02	DB08	53,23	51,66	52,71	53,02	52,66	0,697	1,323
			F05x	PD02	DB08	54,91	56,29	54,59	55,33	55,28	0,738	1,336
			F25x	PB06	DB08	60,5	54,5	58,2	52,9	56,53	3,457	6,115
			F15x	PC01	DB08	62,2	61,3	61,2	62,1	61,70	0,523	0,847
			A65	PD01	DB08	57	62	62	66	61,75	3,686	5,969
			F32	PD01	DB08	62,2	62,1	62,7	62,5	62,38	0,275	0,441
			F16x	PC01	DB08	63,02	61,98	64,51	62,3	62,95	1,126	1,788
			A57	PZ02	DD02	58,3	69,3	63	66,5	64,28	4,744	7,381
			F13x	PD01	DB08	64,3	66,3	66,8	64,4	65,45	1,287	1,967
			F03	PD02	DB08	66,6	66,6	68,3	69,2	67,68	1,295	1,913
			A45x	PA99	DB08	70,6	70	70	69,3	69,98	0,532	0,760
			A49x	PC03	DB08	67,631	70,592	70,22	72,168	70,15	1,881	2,682
Al	(µg/g)	2	F19x	PD02	DB08	115	132	130	112	122,25	10,210	8,352
			A80	PD03	DB10	120	127	131	127	126,25	4,573	3,623
			F25x	PB06	DB08	128,8	127,2	132,4	134	130,60	3,141	2,405
			A60	PD01	DB10	130,1	132,8	133	135,3	132,80	2,128	1,602
			F18x	PD99	DB08	141	131	137	136	136,25	4,113	3,019
			A36	PD02	DB08	147,56	137,96	134,1	132,73	138,09	6,692	4,846
			F12x	PD01	DB08	145,2	144,3	140,7	143	143,30	1,954	1,364

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Additional parameters

Element	Unit	Sample no.	Lab no.	Method code		Replicates				Mean	Si	Vi				
				P	D	1	2	3	4							
Al	(µg/g)	2	F28	PD02	DB08	147,08	148,14	150,35	146,55	148,03	1,682	1,136				
				PD02	DB08	151	152,1	155,4	152,4	152,73	1,882	1,232				
				PD02	DB08	149,5	162,1	157,7	152,5	155,45	5,579	3,589				
				PZ02	DD02	167	161,1	160,2	162,8	162,78	3,016	1,853				
				PC01	DB08	167	172	163,7	167,2	167,48	3,417	2,040				
				PC01	DB08	169,9	174,1	171,1	167,2	170,58	2,861	1,677				
				PD01	DB08	183	196	170	171	180,00	12,193	6,774				
				PD01	DB08	179	181	181	184	181,25	2,062	1,137				
				PD01	DB08	189,6	181,1	187,3	186,5	186,13	3,598	1,933				
				PA99	DB08	187	185	189	193	188,50	3,416	1,812				
				PC03	DB08	188,909	184,312	191,817	193,103	189,54	3,899	2,057				
				Al	(µg/g)	3	A80	PD03	DB10	91,9	83,6	91,3	87,7	88,63	3,829	4,321
								PD02	DB08	90	90,9	98,8	82,9	90,65	6,506	7,177
								PD01	DB10	94,09	93,72	91,47	92,05	92,83	1,270	1,368
PD02	DB08	100,36	89,82					92	89,2	92,85	5,152	5,549				
PD99	DB08	97	96,2					95,8	96,2	96,30	0,503	0,523				
PD01	DB08	97,5	100,2					96,9	96,4	97,75	1,694	1,733				
PB06	DB08	98,7	99,4					101,5	98,2	99,45	1,453	1,461				
PZ02	DD02	103,8	99,5					97,6	97,6	99,63	2,924	2,935				
PD02	DB08	102,79	104,16					103,84	106,05	104,21	1,359	1,304				
PC01	DB08	108,3	109					102,6	103,8	105,93	3,197	3,018				
PD01	DB08	108	107					105	104	106,00	1,826	1,722				
PD02	DB08	109,18	107,96					108,12	107,06	108,08	0,869	0,804				
PC01	DB08	108,8	108,8					111,3	109,3	109,55	1,190	1,086				
PA99	DB08	111	113					113	112	112,25	0,957	0,853				
PC03	DB08	111,606	112,753	112,668	112,366	112,35	0,522	0,465								
PD01	DB08	114,6	115,6	113,1	114,5	114,45	1,028	0,898								
PD01	DB08	117	115	122	112	116,50	4,203	3,608								
PD02	DB08	118,5	118,6	115,2	118	117,58	1,605	1,365								

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Additional parameters

Element	Unit	Sample no.	Lab no.	Method code		Replicates				Mean	Si	Vi
				P	D	1	2	3	4			
Al	(µg/g)	4	A80	PD03	DB10	223	208	245	228	226,00	15,253	6,749
			F25x	PB06	DB08	227,4	229,9	230,6	225	228,23	2,551	1,118
			F19x	PD02	DB08	237	252	225	222	234,00	13,638	5,828
			A60	PD01	DB10	258,3	236,8	245,7	228	242,20	12,939	5,342
			F18x	PD99	DB08	250	258	255	259	255,50	4,041	1,582
			A36	PD02	DB08	267,98	250,64	257,32	250,01	256,49	8,345	3,254
			F05x	PD02	DB08	281,37	276,85	272,33	274,03	276,15	3,951	1,431
			F28	PD02	DB08	275,76	276,19	284,47	280,06	279,12	4,057	1,454
			F15x	PC01	DB08	308,3	320,5	283,8	306	304,65	15,287	5,018
			F12x	PD01	DB08	305,3	306,7	307,2	300,2	304,85	3,203	1,051
			F03	PD02	DB08	291	330,9	332,9	344,1	324,73	23,222	7,151
			A65	PD01	DB08	324	320	332	324	325,00	5,033	1,549
			F32	PD01	DB08	349	342	344	333	342,00	6,683	1,954
			F16x	PC01	DB08	360,3	362,8	370,5	360,1	363,43	4,874	1,341
			A57	PZ02	DD02	355,3	350,3	377	372,4	363,75	12,945	3,559
			Ba	(µg/g)	1	F13x	PD01	DB08	373,1	376,6	366,8	365,7
A45x	PA99	DB08				382	402	394	411	397,25	12,312	3,099
A49x	PC03	DB08				443,646	458,133	427,482	443,614	443,22	12,522	2,825
F16x	PC01	DB10				45,85	44,58	46,01	44,58	45,26	0,782	1,728
A80	PD03	DB10				52,3	51,6	51,4	52,1	51,85	0,420	0,811
A49x	PC03	DB08				53,071	54,084	52,989	53,197	53,34	0,506	0,950
A82	PD01	DB08				55,15	55,14	54,76	54,86	54,98	0,198	0,360
A65	PD01	DB08				55,9	55,2	54,8	55,4	55,33	0,457	0,827
F16x	PC01	DB10				5,29	5,47	5,295	5,338	5,35	0,084	1,570
A80	PD03	DB10				5,67	5,83	5,78	5,85	5,78	0,081	1,393
A82	PD01	DB08				6,258	6,322	6,3	6,279	6,29	0,028	0,437
Ba	(µg/g)	3				A49x	PC03	DB08	6,486	6,483	6,547	6,574
			A65	PD01	DB08	6,8	6,5	6,4	6,5	6,55	0,173	2,644
			F16x	PC01	DB10	19,7	20,03	19,38	19,81	19,73	0,271	1,372

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Additional parameters

Element	Unit	Sample no.	Lab no.	Method code		Replicates				Mean	Si	Vi
				P	D	1	2	3	4			
Ba	(µg/g)	3	A80	PD03	DB10	21,3	21,5	21,6	21,4	21,45	0,129	0,602
				PC03	DB08	22,653	22,774	22,86	22,602	22,72	0,117	0,514
				PD01	DB08	23,7	23,3	23,4	23,4	23,45	0,173	0,739
				PD01	DB08	23,9	23,58	23,33	23,26	23,52	0,290	1,232
Ba	(µg/g)	4	F16x	PC01	DB10	16,34	15,97	15,76	15,75	15,96	0,276	1,730
				PD03	DB10	16,4	16,2	16,7	18,5	16,95	1,054	6,216
				PD01	DB08	18,7	18,4	18,3	20,3	18,93	0,932	4,926
				PD01	DB08	19,14	19,01	18,86	19,66	19,17	0,348	1,814
A49x	DB08	19,611	19,311	19,35	19,193	19,37	0,176	0,910				
Be	(ng/g)	1	F16x	PC01	DB10	3,482	3,273	3,788	3,45	3,50	0,214	6,115
				PD03	DB10	8,9	7,23	7,76	6,42	7,58	1,040	13,721
Be	(ng/g)	2	F16x	PC01	DB10	4,881	4,934	5,198	4,973	5,00	0,140	2,792
				PD03	DB10	8,19	7,26	8,74	9,36	8,39	0,891	10,620
Be	(ng/g)	3	F16x	PC01	DB10	4,93	4,88	4,862	4,583	4,81	0,156	3,251
				PD03	DB10	8,89	7,8	8,11	7,07	7,97	0,754	9,462
Be	(ng/g)	4	F16x	PC01	DB10	10,75	12,45	10,97	11,11	11,32	0,768	6,782
				PD03	DB10	11,4	11,3	13,3	11	11,75	1,047	8,912
Bi	(ng/g)	1	F16x	PC01	DB10	1,78	1,938	1,625	1,76	1,78	0,128	7,220
				PD03	DB10	1,87	1,86	1,95	2,14	1,96	0,130	6,636
Bi	(ng/g)	2	F16x	PC01	DB10	11,69	11,9	12	12,6	12,05	0,390	3,240
				PD03	DB10	13,1	12,8	13,6	14,3	13,45	0,656	4,875
Bi	(ng/g)	3	F16x	PC01	DB10	1,497	1,415	1,458	1,415	1,45	0,039	2,727
				PD03	DB10	1,86	1,65	1,79	1,48	1,70	0,168	9,901
Bi	(ng/g)	4	A80	PD03	DB10	27,8	24,2	25,9	24,7	25,65	1,601	6,242
				PC01	DB10	24,95	27,01	24,69	26,38	25,76	1,118	4,339
Ce	(ng/g)	1	A80	PD03	DB10	79,4	72,8	81,1	85,2	79,63	5,160	6,481
				PD03	DB10	150	154	112	114	132,50	22,591	17,049
Ce	(ng/g)	2	A80	PD03	DB10	56,5	40,9	43,5	40,5	45,35	7,551	16,651
				PD03	DB10	454	363	386	452	413,75	46,292	11,188

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Additional parameters

Element	Unit	Sample no.	Lab no.	Method code		Replicates				Mean	Si	Vi
				P	D	1	2	3	4			
Cl	(µg/g)	1	F02	PA06	DF08	340	350	340	340	342,50	5,000	1,460
			A57	PZ02	DD02	410	410	410	420	412,50	5,000	1,212
			A45	PZ02	DD01	418	419	421	427	421,25	4,031	0,957
			F16x	PZ02	DD01	431,2	448	456,5	456,4	448,03	11,903	2,657
Cl	(µg/g)	2	F02	PA06	DF08	190	190	160	150	172,50	20,616	11,951
			A45	PZ02	DD01	258	256	258	262	258,50	2,517	0,974
			A57	PZ02	DD02	270	280	280	280	277,50	5,000	1,802
			F16x	PZ02	DD01	277	274,2	275,1	319,6	286,48	22,114	7,719
Cl	(µg/g)	3	F02	PA06	DF08	580	550	560	550	560,00	14,142	2,525
			A57	PZ02	DD02	630	650	630	620	632,50	12,583	1,989
			A45	PZ02	DD01	664	646	671	660	660,25	10,532	1,595
			F16x	PZ02	DD01	801,5	781,6	798	758,5	784,90	19,622	2,500
Cl	(µg/g)	4	A45	PZ02	DD01	2360	2350	2410	2370	2372,50	26,300	1,109
			F02	PA06	DF08	2620	2710	2260	2460	2512,50	197,547	7,863
			A57	PZ02	DD02	2760	2790	2730	2760	2760,00	24,495	0,887
			F16x	PZ02	DD01	3836	3744	3936	4047	3890,75	130,377	3,351
Cs	(ng/g)	1	A80	PD03	DB10	827	823	809	832	822,75	9,878	1,201
Cs	(ng/g)	2	A80	PD03	DB10	33,1	33,9	34,1	33,8	33,73	0,435	1,290
Cs	(ng/g)	3	A80	PD03	DB10	1300	1310	1310	1310	1307,50	5,000	0,382
Cs	(ng/g)	4	A80	PD03	DB10	40,3	37,3	40,5	40,2	39,58	1,522	3,845
F	(µg/g)	1	F32	PB99	DD99	<5	<5	<5	<5			
F	(µg/g)	2	F02	PE01	DF03	<3	<3	<3	<3			
F	(µg/g)	3	F32	PB99	DD99	<5	<5	<5	<5			
F	(µg/g)	4	F02	PE01	DF03	<3	<3	<3	<3			
La	(ng/g)	1	A80	PD03	DB10	53,4	50,2	54,9	57,2	53,93	2,934	5,441

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Additional parameters

Element	Unit	Sample no.	Lab no.	Method code		Replicates				Mean	Si	Vi
				P	D	1	2	3	4			
La	(ng/g)	2	A80	PD03	DB10	76,9	78,7	58	60,3	68,48	10,833	15,821
La	(ng/g)	3	A80	PD03	DB10	34,1	25,2	27,3	26	28,15	4,060	14,423
La	(ng/g)	4	A80	PD03	DB10	235	180	193	226	208,50	26,211	12,571
Li	(µg/g)	1	A80	PD03	DB10	0,0933	0,0944	0,0936	0,094	0,09	0,000	0,510
Li	(µg/g)	2	A80	PD03	DB10	1,6	1,61	1,61	1,62	1,61	0,008	0,507
Li	(µg/g)	3	A80	PD03	DB10	0,193	0,186	0,186	0,184	0,19	0,004	2,108
Li	(µg/g)	4	A80	PD03	DB10	0,334	0,324	0,344	0,334	0,33	0,008	2,445
Mo	(ng/g)	1	A49x	PC03	DB08	<600	<600	<600	<600	<600		
			A80	PD03	DB10	408	433	422	418	420,25	10,340	2,460
			F13x	PD01	DB10	416	428	420	440	426,00	10,583	2,484
			F16x	PC01	DB10	446,1	432,8	455,6	438,4	443,23	9,889	2,231
			A36	PD02	DB10	463,1	451,9	450,3	445,2	452,63	7,545	1,667
			A88	PD01	DB05	469,44	456,23	470,5	428,21	456,10	19,691	4,317
			F32	PD01	DB10	431	1047	422	447	586,75	307,007	52,323
Mo	(ng/g)	2	A49x	PC03	DB08	<600	<600	<600	<600	<600		
			F32	PD01	DB10	173	169	176	169	171,75	3,403	1,982
			A80	PD03	DB10	183	179	178	182	180,50	2,380	1,319
			F16x	PC01	DB10	181,6	185,7	183,2	184,8	183,83	1,808	0,984
			A36	PD02	DB10	188,37	183,49	185,19	192,29	187,34	3,873	2,068
			F13x	PD01	DB10	190	197	190	186	190,75	4,573	2,398
			A88	PD01	DB05	245,42	205,66	227,92	259,73	234,68	23,315	9,935
Mo	(ng/g)	3	A49x	PC03	DB08	<600	<600	<600	<600	<600		
			F32	PD01	DB10	95,5	91,6	97,4	87,5	93,00	4,390	4,721
			A36	PD02	DB10	100,1	102,5	98,4	99,8	100,20	1,703	1,700
			F16x	PC01	DB10	100,6	104,9	99,59	101,3	101,60	2,311	2,275
			A80	PD03	DB10	94,1	104	111	101	102,53	7,007	6,835
			F13x	PD01	DB10	110	100	103	106	104,75	4,272	4,078
			A88	PD01	DB05	86,13	112,56	116,25	126,82	110,44	17,297	15,662
Mo	(ng/g)	4	A80	PD03	DB10	773	741	801	754	767,25	26,056	3,396

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Additional parameters

Element	Unit	Sample no.	Lab no.	Method code		Replicates				Mean	Si	Vi	
				P	D	1	2	3	4				
Mo	(ng/g)	4	A36	PD02	DB10	758,1	781,9	785,2	748,8	768,50	17,839	2,321	
			A49x	PC03	DB08	757	810	864	725	789,00	61,063	7,739	
			F13x	PD01	DB10	834	823	804	844	826,25	17,134	2,074	
			F16x	PC01	DB10	828	884,7	819,2	857,2	847,28	29,771	3,514	
			F32	PD01	DB10	897	897	907	862	890,75	19,738	2,216	
			A88	PD01	DB05	924,95	965,44	924,95	884,45	924,95	33,064	3,575	
			F03	PD02	DB08	<50	<50	<50	<50	<50			
			F15x	PC01	DB08	<20	<20	<20	<20	<20			
			F19x	PD02	DB08	<7,74	<7,76	<9,81	<8,42				
			A97	PC02	DB10	0,28	0,25	0,31	0,29	0,28	0,28	0,025	8,850
Na	(µg/g)	1	A60	PC01	DB10	10,07	10,25	9,163	10,63	10,03	0,622	6,205	
			F32	PD01	DB08	12,1	11,4	12,2	11,4	11,78	0,435	3,694	
			A80	PD03	DB10	13,4	12,7	12	12,3	12,60	0,606	4,806	
			F05	PD02	DB08	12,79	12,88	12,7	12,91	12,82	0,095	0,740	
			F16x	PC01	DB10	12,81	12,71	13,05	12,78	12,84	0,148	1,151	
			F18x	PD99	DB08	13,3	13,5	13,4	13,1	13,33	0,171	1,282	
			F13x	PD01	DB10	12,45	13,23	13,8	15,4	13,72	1,249	9,105	
			A88	PD01	DB08	12,61	12,37	18,73	12,58	14,07	3,107	22,077	
			A36	PD02	DB08	18,4	18,15	17,61	17,69	17,96	0,376	2,096	
			A65	PD01	DB08	19,9	18,5	17	19,3	18,68	1,255	6,722	
Na	(µg/g)	2	A49x	PC03	DB08	19,846	20,09	20,603	20,25	20,20	0,317	1,572	
			F28	PD02	DB08	21,26	19,89	20,07	20,17	20,35	0,619	3,043	
			F12x	PD01	DB08	34,7	27,8	21,2	29,4	28,28	5,563	19,673	
			F24	PD02	DB99	43	6	82	44	43,75	31,031	70,928	
			F25x	PB06	DB08	48	46,6	48,4	46,6	47,40	0,938	1,979	
			F03	PD02	DB08	<50	<50	<50	<50	<50			
			F15x	PC01	DB08	<20	<20	<20	<20	<20			
			A97	PC02	DB10	0,3	0,31	0,31	0,28	0,30	0,014	4,714	
			F19x	PD02	DB08	<10,6	10,3	10,9	8,95	10,05	0,999	9,938	

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Additional parameters

Element	Unit	Sample no.	Lab no.	Method code		Replicates				Mean	Si	Vi			
				P	D	1	2	3	4						
Na	(µg/g)	2	A60	PC01	DB10	15,32	13,11	15,47	14,24	14,54	1,097	7,545			
			A88	PD01	DB08	15,3	15,72	15,43	16,05	15,63	0,333	2,133			
			A36	PD02	DB08	16,66	17,26	15,91	15,79	16,41	0,688	4,193			
			A80	PD03	DB10	17	17,4	17,1	17	17,13	0,189	1,105			
			F05	PD02	DB08	18,38	18,29	18,07	18,29	18,26	0,132	0,723			
			F18x	PD99	DB08	18,4	18,6	18,5	18,2	18,43	0,171	0,927			
			F16x	PC01	DB10	19,34	19,72	20,26	20,34	19,92	0,472	2,370			
			F32	PD01	DB08	21,9	22,6	22,7	22,6	22,45	0,370	1,647			
			F28	PD02	DB08	21,39	22,57	23,24	22,79	22,50	0,789	3,508			
			F13x	PD01	DB10	23,31	21,82	25,3	20,67	22,78	2,000	8,783			
			A65	PD01	DB08	26,9	27,2	28,2	26,8	27,28	0,640	2,345			
			F12x	PD01	DB08	34,9	31,4	24,5	26,7	29,38	4,674	15,913			
			A49x	PC03	DB08	31,474	29,017	30,505	29,37	30,09	1,119	3,719			
			F25x	PB06	DB08	45,8	53,1	50,2	48,8	49,48	3,035	6,134			
			F24	PD02	DB99	86	147	108	113	113,50	25,226	22,225			
			Na	(µg/g)	3	F03	PD02	DB08	<50	<50	<50	<50			
						F15x	PC01	DB08	<20	<20	<20	<20			
						A65	PD01	DB08	<11,1	<11,1	<11,1	<11,1			
						F19x	PD02	DB08	<7,73	<7,28	<10,5	<8,48			
						F05	PD02	DB08	<6,25	<6,25	<6,25	<6,25			
F18x	PD99	DB08				<5	<5	<5	<5						
A60	PC01	DB10				<5	<5	<5	<5						
F32	PD01	DB08				<1	<1	<1	<1						
A97	PC02	DB10				0,22	0,24	0,24	0,27	0,24	0,021	8,501			
A80	PD03	DB10				2,71	2,54	2,56	2,64	2,61	0,078	2,988			
F16x	PC01	DB10				2,316	3,041	2,883	2,981	2,81	0,333	11,856			
A36	PD02	DB08				3,94	4,22	3,82	3,9	3,97	0,174	4,382			
F13x	PD01	DB10				5,48	3,23	5,23	3,35	4,32	1,198	27,706			
A88	PD01	DB08				4,94	5,09	4,81	4,29	4,78	0,348	7,270			

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Additional parameters

Element	Unit	Sample no.	Lab no.	Method code		Replicates				Mean	Si	Vi
				P	D	1	2	3	4			
Na	(µg/g)	3	A49x	PC03	DB08	6,682	5,618	5,822	5,737	5,96	0,485	8,138
			F12x	PD01	DB08	16,9	23	12,6	17,5	17,50	4,267	24,382
			F28	PD02	DB08	23,34	23,55	24,68	24,6	24,04	0,696	2,895
			F25x	PB06	DB08	32,8	32,2	32,7	32,7	32,60	0,271	0,831
			F24	PD02	DB99	119	103	71	103	99,00	20,133	20,336
			A97	PC02	DB10	0,28	0,29	0,3	0,25	0,28	0,022	7,715
			F19x	PD02	DB08	28,5	28,7	26,8	24,8	27,20	1,813	6,665
			A80	PD03	DB10	30,3	31,9	31,6	31,8	31,40	0,744	2,369
			A36	PD02	DB08	33,33	32,55	29,95	33,25	32,27	1,586	4,914
			A88	PD01	DB08	33,7	31,64	31,5	36,28	33,28	2,239	6,727
Na	(µg/g)	4	F05	PD02	DB08	33,8	34,84	34,11	33,45	34,05	0,592	1,738
			F15x	PC01	DB08	37	32,1	35,5	33,1	34,43	2,232	6,484
			A60	PC01	DB10	26,77	29,94	27,83	56,39	35,23	14,166	40,208
			F18x	PD99	DB08	35	36,3	36	35,7	35,75	0,557	1,557
			F16x	PC01	DB10	33,13	36,23	38,99	39,76	37,03	3,008	8,124
			F32	PD01	DB08	41,9	38,8	36,6	35,1	38,10	2,954	7,754
			A65	PD01	DB08	37,4	38	38,9	38,9	38,30	0,735	1,919
			F13x	PD01	DB10	44,31	39,16	43,28	44,1	42,71	2,410	5,642
			F12x	PD01	DB08	46,3	52,7	54,8	41	48,70	6,279	12,892
			F28	PD02	DB08	55,46	55,09	54,74	55,85	55,29	0,478	0,864
Nb	(ng/g)	1	F03	PD02	DB08	53,28	57,34	57,07	54,83	55,63	1,929	3,467
			F25x	PB06	DB08	66,3	63,8	66,2	65,4	65,43	1,156	1,767
			A49x	PC03	DB08	78,848	86,262	76,801	82,296	81,05	4,148	5,118
			F24	PD02	DB99	273	238	195	223	232,25	32,490	13,989
			A80	PD03	DB10	6,11	6,46	6,15	6,6	6,33	0,238	3,767
			A80	PD03	DB10	12,4	13,2	14,3	14,2	13,53	0,900	6,651
			A80	PD03	DB10	4,79	3,33	5,08	3,92	4,28	0,803	18,751
			A80	PD03	DB10	39,7	39,7	46,7	42,2	42,08	3,301	7,845
			F16x	PC01	DB10	22,82	22,39	21,44	22,85	22,38	0,658	2,940

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Additional parameters

Element	Unit	Sample no.	Lab no.	Method code		Replicates				Mean	Si	Vi
				P	D	1	2	3	4			
Se	(ng/g)	3	A82	PD01	DB10	2,84	3,155	2,77	2,917	2,92	0,167	5,734
			A36	PD02	DB10	3,94	4,36	4,26	3,94	4,13	0,217	5,272
Se	(ng/g)	4	A82	PD01	DB10	50,25	50,93	49,52	50,5	50,30	0,591	1,175
			F32	PD01	DB04	54	55	53	55	54,25	0,957	1,765
			A36	PD02	DB10	78,53	79,38	78,64	75,03	77,90	1,947	2,499
			F16x	PC01	DB10	82,24	89,03	90,4	102,9	91,14	8,612	9,449
Si	(µg/g)	1	F16x	PZ02	DD01	1568	1573	1612	1538	1572,75	30,391	1,932
Si	(µg/g)	2	F16x	PZ02	DD01	1510	1489	1552	1489	1510,00	29,698	1,967
Si	(µg/g)	3	F16x	PZ02	DD01	2237	2196	2228	2250	2227,75	23,013	1,033
Si	(µg/g)	4	F16x	PZ02	DD01	7690	8148	8328	8055	8055,25	268,578	3,334
Sn	(ng/g)	1	A80	PD03	DB10	20,4	21	21,8	21,9	21,28	0,709	3,332
			F16x	PC01	DB10	28,06	23,36	28,09	24,23	25,94	2,496	9,626
Sn	(ng/g)	2	F16x	PC01	DB10	182,2	195,6	182,7	193,1	188,40	6,949	3,688
			A80	PD03	DB10	217	206	219	225	216,75	7,932	3,660
Sn	(ng/g)	3	F16x	PC01	DB10	19,9	17,8	20,67	18,62	19,25	1,283	6,666
			A80	PD03	DB10	39,5	46	46,6	42,8	43,73	3,274	7,487
Sn	(ng/g)	4	F16x	PC01	DB10	315,3	341,7	337,1	340,7	333,70	12,425	3,723
			A80	PD03	DB10	419	387	411	362	394,75	25,721	6,516
Sr	(µg/g)	1	F16x	PC01	DB10	28,5	28,66	27,42	28,4	28,25	0,560	1,984
			A80	PD03	DB10	29,3	29,5	29,6	29,5	29,48	0,126	0,427
			A60	PD01	DB10	30,08	29,97	30,13	30,71	30,22	0,332	1,098
			A65	PD01	DB08	31,9	31,8	32	32,2	31,98	0,171	0,534
			F32	PC01	DB08	33,9	34,1	33,3	35,3	34,15	0,839	2,456
Sr	(µg/g)	2	F16x	PC01	DB10	16,61	18,06	17,52	17,73	17,48	0,621	3,553
			A80	PD03	DB10	18,7	18,9	18,6	18,9	18,78	0,150	0,799
			A60	PD01	DB10	18,45	19	19,04	19,16	18,91	0,316	1,669
			A65	PD01	DB08	19,9	19,7	19,6	19,9	19,78	0,150	0,759
			F32	PC01	DB08	20,9	20,7	21,2	20,9	20,93	0,206	0,985
Sr	(µg/g)	3	F16x	PC01	DB10	11,53	11,78	11,33	11,57	11,55	0,184	1,597

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Additional parameters

Element	Unit	Sample no.	Lab no.	Method code		Replicates				Mean	Si	Vi
				P	D	1	2	3	4			
Sr	(µg/g)	3	A60	PD01	DB10	12,31	11,66	11,99	12,42	12,10	0,343	2,832
				PD03	DB10	12,1	12,1	12,2	12	12,10	0,082	0,675
				PD01	DB08	13,2	13,2	13,2	13	13,15	0,100	0,760
				PC01	DB08	14	14,1	14,2	13,7	14,00	0,216	1,543
Sr	(µg/g)	4	F16x	PC01	DB10	34,88	37,44	35,67	37	36,25	1,182	3,261
				PD03	DB10	38,3	38,1	38,7	38,7	38,45	0,300	0,780
				PD01	DB10	39,22	40,06	40,52	40,83	40,16	0,700	1,744
				PD01	DB08	40,7	40,3	39,7	40,4	40,28	0,419	1,041
Ti	(µg/g)	1	A65	PC01	DB08	43,2	43	43,3	43,2	43,18	0,126	0,291
				PD01	DB08	3,8	3,6	4,1	4	3,88	0,222	5,722
				PD01	DB08	5,5	5,9	5,3	5	5,43	0,377	6,958
				PD01	DB08	3,3	3,1	3,2	3,5	3,28	0,171	5,215
Ti	(µg/g)	4	A65	PD01	DB08	13	13	14	14,4	13,60	0,712	5,234
				PD01	DB10	27,9	27,81	27,97	27,78	27,87	0,087	0,311
				PD02	DB10	28,97	28,54	28,44	29,29	28,81	0,394	1,368
				PC01	DB10	29,75	29,25	29,11	29,03	29,29	0,323	1,103
Ti	(ng/g)	2	A36	PD01	DB10	32,3	30,6	30	30,3	30,80	1,030	3,343
				PD03	DB10	32	31,7	32,3	31,2	31,80	0,469	1,475
				PD01	DB10	33,9	34	34,2	33,4	33,88	0,340	1,005
				PD02	DB10	3,07	3,18	3,18	3,07	3,13	0,064	2,032
Ti	(ng/g)	3	A82	PD01	DB10	3,146	3,307	3,223	3,114	3,20	0,086	2,694
				PD03	DB10	3,18	3,18	3,36	3,52	3,31	0,164	4,946
				PC01	DB10	3,349	3,375	3,346	3,375	3,36	0,016	0,474
				PD01	DB10	4	3,8	3,4	3,7	3,73	0,250	6,711
Ti	(ng/g)	3	A82	PD01	DB10	4,45	3,81	3,92	4,24	4,11	0,294	7,151
				PD01	DB10	13,88	13,96	14,33	14	14,04	0,198	1,410
				PD02	DB10	16,61	16,61	15,97	16,29	16,37	0,306	1,872
				PC01	DB10	17,25	17,32	17,47	16,71	17,19	0,331	1,928
Ti	(ng/g)	A80	F16x	PD03	DB10	17,7	17,9	17,7	17,4	17,68	0,206	1,166

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Additional parameters

Element	Unit	Sample no.	Lab no.	Method code		Replicates				Mean	Si	Vi
				P	D	1	2	3	4			
Tl	(ng/g)	3	F13x	PD01	DB10	19	18,7	17,2	17,4	18,08	0,907	5,018
			F32	PD01	DB10	19	19	19	18,3	18,83	0,350	1,859
			A82	PD01	DB10	8,904	8,82	8,959	8,818	8,88	0,069	0,774
Tl	(ng/g)	4	A36	PD02	DB10	9,03	9,14	9,03	9,03	9,06	0,055	0,607
			A80	PD03	DB10	9,6	9,28	9,72	9,36	9,49	0,205	2,160
			F16x	PC01	DB10	10,09	9,773	9,776	10,02	9,91	0,164	1,659
U	(ng/g)	1	F13x	PD01	DB10	11,4	11,1	10,7	10,6	10,95	0,370	3,376
			F32	PD01	DB10	11,9	14	13	14	13,23	1,001	7,571
			F16x	PC01	DB10	0,76	0,7317	0,7483	0,7532	0,75	0,012	1,612
U	(ng/g)	2	A80	PD03	DB10	0,76	0,726	0,781	0,781	0,76	0,026	3,407
			A36	PD02	DB10	0,85	0,74	0,74	0,74	0,77	0,055	7,166
			F16x	PC01	DB10	22,42	22,08	23,05	22,24	22,45	0,425	1,893
U	(ng/g)	3	A80	PD03	DB10	24,1	25	23,7	23,7	24,13	0,613	2,541
			A36	PD02	DB10	24,16	24,9	24,47	24,68	24,55	0,315	1,283
			A36	PD02	DB10	0,958	0,852	0,852	0,852	0,88	0,053	6,033
U	(ng/g)	4	F16x	PC01	DB10	0,9154	0,9136	0,8111	0,8758	0,88	0,049	5,551
			A80	PD03	DB10	1,14	0,9	1,15	0,875	1,02	0,149	14,669
			F16x	PC01	DB10	20,55	21,63	20,36	21,39	20,98	0,622	2,963
V	(µg/g)	1	A80	PD03	DB10	22,2	19,3	20,5	22,4	21,10	1,472	6,976
			F16x	PC01	DB10	1,05	1,08	1,04	1,05	1,06	0,017	1,642
			F13x	PD01	DB10	1,036	1,091	1,067	1,072	1,07	0,023	2,139
V	(µg/g)	2	F32	PD01	DB10	1,104	1,123	1,186	1,131	1,14	0,035	3,099
			A60	PC01	DB10	1,24	1,22	1,25	1,22	1,23	0,015	1,217
			A80	PD03	DB10	1,021	2,066	1,066	1,077	1,31	0,506	38,719
V	(µg/g)	2	A80	PD03	DB10	0,152	0,157	0,162	0,163	0,16	0,005	3,196
			A60	PC01	DB10	0,1745	0,1482	0,1585	0,1544	0,16	0,011	7,067
			F16x	PC01	DB10	0,1763	0,1638	0,1746	0,1671	0,17	0,006	3,502
F13x	PD01	DB10	0,193	0,202	0,203	0,201	0,20	0,005	2,290			

28th Needle/Leaf Interlaboratory Comparison Test 2025/2026

Additional parameters

Element	Unit	Sample no.	Lab no.	Method code		Replicates				Mean	Si	Vi
				P	D	1	2	3	4			
V	(µg/g)	2	F32	PD01	DB10	0,212	0,22	0,21	0,199	0,21	0,009	4,117
V	(µg/g)	3	A80	PD03	DB10	0,122	0,109	0,134	0,116	0,12	0,011	8,811
				PC01	DB10	0,1096	0,1246	0,1365	0,1346	0,13	0,012	9,746
				PD01	DB10	0,129	0,127	0,143	0,123	0,13	0,009	6,666
				PC01	DB10	0,1318	0,1345	0,1279	0,1296	0,13	0,003	2,180
				PD01	DB10	0,152	0,152	0,141	0,134	0,14	0,009	6,111
V	(µg/g)	4	A80	PD03	DB10	0,593	0,551	0,615	0,602	0,59	0,028	4,690
				PC01	DB10	0,6221	0,6117	0,6371	0,6331	0,63	0,011	1,829
				PC01	DB10	0,6887	0,7105	0,7118	0,7083	0,70	0,011	1,539
				PD01	DB10	0,805	0,781	0,749	0,787	0,78	0,023	2,991
				PD01	DB10	0,763	0,762	0,812	0,793	0,78	0,024	3,114
W	(ng/g)	1	A80	PD03	DB10	8,92	9,11	10,7	7,75	9,12	1,213	13,299
W	(ng/g)	2	A80	PD03	DB10	10,9	9,88	13,8	10,9	11,37	1,690	14,862
W	(ng/g)	3	A80	PD03	DB10	4,44	3,95	4,24	5,11	4,44	0,493	11,114
W	(ng/g)	4	A80	PD03	DB10	49,8	47,8	48,7	45,3	47,90	1,917	4,001

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Austrian Research Centre for Forests (BFW)
Forest Foliar Co-ordinating Centre
Seckendorff-Gudent Weg 8
A-1131 Vienna

Phone: +431-87838-1176
Fax: +431-87838-1250

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URL: <http://www.ffcc.at>
e-Mail: michael.tatzber@bfw.gv.at

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