WAGENINGEN EVALUATING PROGRAMS

FOR ANALYTICAL LABORATORIES

Certificate of Analysis

International Plant-Analytical Exchange

REFERENCE MATERIAL

IPE sample 206

WAGENINGEN
UNIVERSITY & RESEARCH

Certificate of Analysis IPE 206

General Information

In this report an overview is given of analytical data for this sample collected in our proficiency testing program. The consensus values are calculated using a robust statistical model. With this NDA model, the mean and standard deviation are calculated using all reported data when at least 4 results are left after removal of reported 'lower than' (<) and 0 (= zero) values. No outliers are removed.

This report is divided into two sections: Consensus Values and Indicative Values. The division is made on the reliability of the data. Consensus Values are based on at least 8 results and a maximum relative uncertainty of 6.25%. Indicative Values are based on a maximum relative uncertainty of 35% and a minimum of 4 and maximum of 7 results, or a relative uncertainty greater than 6.25% when there are at least 8 results.

For each determinand the following parameters are given: mean, standard deviation, coefficient of variation, number of results, median, MAD (Median of Absolute Deviation), the uncertainty of the mean (consensus or indicative) value and the relative uncertainty.

All values, expressed on a weight basis (kg or %), are reported as oven-dried (105°C) material. Moisture is reported in the material as received.

Sample information

WEPAL reference materials are from natural sources only. There is no spiking, mixing or other alterations of the samples. For sample preparation, the IPE samples are dried at 70°C and milled to pass a 0.5 mm sieve.

This IPE sample 206 of Sorghem (plant) / Sorgum bicolor, from Austria, is prepared for the WEPAL proficiency programs. The sample has been used in 2 periods (or rounds). The results on which the values in this report are based were taken from the periods given in the following table:

Year	Round	Number
2015	3	3
2011	2	3

Consensus Values IPE 206

Method: Inorganic Chemical Composition

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
B	mg/kg	2.85	1.04	36.5	153	2.94	0.600	0.105	3.68
Cu	mg/kg	2.35	0.459	19.5	206	2.38	0.285	0.040	1.70
Fe	mg/kg	162	17.7	10.9	208	162	11.0	1.54	0.946
Mn	mg/kg	20.9	1.90	9.1	215	21.0	1.15	0.162	0.773
Zn	mg/kg	12.5	1.49	12.0	208	12.5	1.00	0.129	1.04
As	µg/kg	64.1	16.5	25.7	39	65.2	8.60	3.30	5.14
Cd	µg/kg	53.5	8.75	16.4	61	54.4	5.58	1.40	2.62
Co	µg/kg	67.0	11.8	17.5	51	67.0	8.70	2.06	3.07
Cr	µg/kg	819	209	25.6	50	811	108	37.0	4.52
Mo	µg/kg	214	40.2	18.7	55	218	22.2	6.77	3.16
Pb	µg/kg	219	72.4	33.1	55	237	39.0	12.2	5.57
Ba	mg/kg	4.77	0.450	9.4	28	4.83	0.286	0.106	2.23
Sr	mg/kg	9.23	0.858	9.3	27	9.26	0.420	0.206	2.24
Rb	µg/kg	1532	140	9.1	8	1551	75.0	61.9	4.04
Ca	g/kg	3.00	0.270	9.0	225	3.01	0.174	0.023	0.752
Cl (as Cl)	g/kg	2.22	0.203	9.1	47	2.26	0.160	0.037	1.66
K	g/kg	9.59	0.767	8.0	230	9.59	0.485	0.063	0.660
Mg	g/kg	1.05	0.083	7.9	230	1.05	0.050	0.007	0.648
N - Kjeldahl (as N)	g/kg	5.28	0.514	9.7	149	5.29	0.314	0.053	0.996
P (as P)	g/kg	1.22	0.096	7.9	231	1.23	0.060	0.008	0.648
S (as S)	g/kg	0.650	0.063	9.6	137	0.653	0.043	0.007	1.03

Method: Real totals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
C - elementary	g/kg	450	11.7	2.6	74	450	7.42	1.70	0.379
N - elementary	g/kg	5.72	0.616	10.8	112	5.70	0.355	0.073	1.27

Method: Acid extractable (So-called totals)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Al	mg/kg	90.7	22.3	24.6	47	89.9	15.9	4.06	4.48

Method: Other determinations

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
delta 13C	‰ V-PDB	-12.0	0.321	2.7	17	-11.9	0.183	0.097	0.812
delta 15N	‰ Air	1079	55.1	5.1	19	1079	30.2	15.8	1.46

Consensus Values IPE 206

Method: Nutritional values

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Crude fibre	g/kg	275	19.7	7.2	13	277	11.6	6.84	2.49
ADF-ash-free	g/kg	306	29.7	9.7	9	307	22.9	12.4	4.04
NDF-ash-free	g/kg	529	26.8	5.1	9	529	21.5	11.2	2.11
Total ash	g/kg	43.5	2.63	6.0	28	43.8	1.55	0.621	1.43

Indicative Values IPE 206

Method: Inorganic Chemical Composition

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Hg	µg/kg	2.17	1.15	53.0	20	2.70	0.845	0.321	14.8
I	µg/kg	84.0	45.0	53.6	6	90.8	23.3	23.0	27.4
Li	µg/kg	97.5	37.8	38.8	11	97.9	18.3	14.3	14.6
Ni	µg/kg	370	131	35.3	42	368	77.8	25.2	6.80
Se	µg/kg	27.3	7.46	27.3	25	28.0	4.10	1.87	6.83
Sb	µg/kg	9.24	6.43	69.6	11	9.85	3.95	2.42	26.2
Sn	µg/kg	35.4	59.7	168.6	9	63.4	43.7	24.9	70.3
Ti	mg/kg	3.67	2.37	64.6	14	3.71	1.45	0.792	21.6
V	µg/kg	147	70.5	47.8	22	146	48.4	18.8	12.7
Be	µg/kg	3.43	1.08	31.4	6	3.77	0.555	0.550	16.0
Cs	µg/kg	16.2	2.77	17.1	4	16.1	1.25	1.73	10.7
N - NO3 (as N)	mg/kg	11.7	10.1	87.0	8	13.1	6.43	4.48	38.4
Na	mg/kg	28.8	27.3	94.9	108	31.7	19.3	3.29	11.4
SO4 (as SO4)	g/kg	0.600	0.685	114.2	8	0.850	0.540	0.303	50.5

Method: Real totals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Al	mg/kg	122	41.1	33.6	32	119	36.7	9.09	7.43
Si	mg/kg	7833	606	7.7	6	7959	323	309	3.95

Method: Nutritional values

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Total fat	g/kg	8.84	3.86	43.6	8	9.40	2.41	1.70	19.3