



**WAGENINGEN EVALUATING PROGRAMS
FOR ANALYTICAL LABORATORIES**

Certificate of Analysis



International Plant-Analytical Exchange

REFERENCE MATERIAL

IPE sample 853



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 mean and standard deviation are calculated using all reported data when at least 8 results are left after removal of reported 'lower than' (<) and 0 (= zero) values. No outliers are removed.

This report is divided into three sections: Consensus Values, Indicative Values and Values for Information. The division is made on the reliability of the data. Consensus Values are based on at least 16 results while the coefficient of variation is smaller than 25 %. Indicative Values are based on at least 8 and less than 16 results or a coefficient of variation between 25 % and 50 %. Other values, based on more than 2 and less than 8 results or a coefficient of variation higher than 50 %, are given for information only.

In the sections with Consensus Values and Indicative Values the following parameters are given: mean, standard deviation, coefficient of variation, number of results, median and MAD (Median of Absolute Deviation) and the uncertainty in the consensus values. The confidence limits (at 95 % probability) are calculated for these determinands.

In the section with Information Values the following parameters are given: median, MAD and number of results. For determinands which have at least 5 results reported as smaller than (<) the median of these 'smaller than results' is calculated. In some cases this median of '<' values is much smaller than median and mean of the indicative values. This may be caused by a too optimistic (too low) value for the detection limit reported by a (small) majority of participating laboratories who report '<' -values.

All values, expressed on a weight basis (kg or %), are reported in oven dry (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 853 of Carrots (leaf) / *Daucus carota* L. from Netherlands is prepared for the WEPAL proficiency programs. The sample is used in 1 period (or round). The results on which the values in this report are based were taken from the period given in the following table.

Year	Round	Number
1996	1	6



Consensus Values IPE 853



Method: Inorganic Chemical Composition

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
As	µg/kg	802	150.7	18.8	16	819	105.0	47.1	722	-	882
B	mg/kg	40.6	4.76	11.7	72	40.7	3.33	0.70	39.5	-	41.7
Ca	g/kg	23.7	1.61	6.8	124	23.7	1.12	0.18	23.46	-	24.03
Cd	µg/kg	321	60.7	18.9	38	316	40.5	12.3	301	-	341
Cl (as Cl)	g/kg	19.6	1.75	9.0	26	19.8	1.22	0.43	18.9	-	20.3
Co	µg/kg	395	60.6	15.3	23	410	46.0	15.8	369	-	421
Cr	µg/kg	3250	688	21.2	29	3300	450	160	2988	-	3511
Cu	mg/kg	6.54	1.014	15.5	112	6.50	0.670	0.120	6.35	-	6.73
Fe	mg/kg	1400	217	15.5	107	1390	150	26	1363	-	1446
Hg	µg/kg	23.5	3.60	15.3	16	23.5	2.50	1.13	21.6	-	25.4
K	g/kg	28.3	1.72	6.1	126	28.4	1.17	0.19	27.99	-	28.60
Mg	g/kg	3.12	0.243	7.8	124	3.12	0.170	0.027	3.08	-	3.16
Mn	mg/kg	45.2	5.40	12.0	118	45.8	3.75	0.62	44.2	-	46.2
Mo	µg/kg	1930	333	17.3	18	1970	235	98	1764	-	2094
N - Kjeldahl (as N)	g/kg	20.0	1.13	5.6	81	20.1	0.80	0.16	19.72	-	20.22
N - NO3 (as N)	mg/kg	905	72.5	8.0	17	911	49.0	22.0	868	-	943
Na	mg/kg	11200	990	8.8	86	11100	710	130	10986	-	11409
Ni	µg/kg	1520	306	20.1	25	1620	228	77	1397	-	1650
P (as P)	g/kg	1.99	0.126	6.3	119	1.99	0.090	0.014	1.96	-	2.01
Pb	µg/kg	3330	696	20.9	35	3360	483	147	3090	-	3568
S (as S)	g/kg	4.88	0.312	6.4	47	4.87	0.224	0.057	4.78	-	4.97
Zn	mg/kg	25.5	3.08	12.1	116	25.8	2.15	0.36	25.0	-	26.1

Method: Real totals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
N - elementary	g/kg	21.0	1.12	5.3	30	21.0	0.81	0.25	20.5	-	21.4



Indicative Values IPE 853



Method: Inorganic Chemical Composition

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Ba	mg/kg	17.8	4.96	27.9	10	17.9	3.15	1.96	14.3	-	21.3
Sr	mg/kg	51.6	3.30	6.4	13	52.0	2.30	1.14	49.6	-	53.5
V	µg/kg	2880	795	27.6	10	2860	510	314	2320	-	3440



Informative Values IPE 853



Method: Inorganic Chemical Composition

Element	Unit	Median	MAD	N
Be	µg/kg	67.0	13.00	7
Li	µg/kg	2280	440	6
N - NH4 (as N)	mg/kg	84.1	5.60	3
Sb	µg/kg	37.5	10.00	4
Se	µg/kg	147	23.0	5
SO4 (as SO4)	g/kg	10.8	0.67	7
Ti	mg/kg	42.3	31.70	4