



**WAGENINGEN EVALUATING PROGRAMS
FOR ANALYTICAL LABORATORIES**

Certificate of Analysis



International Plant-Analytical Exchange

REFERENCE MATERIAL

IPE sample 946



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 946 of Wintercarrots (leaf) / *Daucus carota* l. var. 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
1995	1	4



Consensus Values IPE 946



Method: Inorganic Chemical Composition

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
B	mg/kg	40.6	4.99	12.3	75	40.5	3.50	0.72	39.4	-	41.7
Ca	g/kg	23.8	1.96	8.3	135	23.6	1.36	0.21	23.42	-	24.09
Cd	µg/kg	307	70.4	22.9	37	306	50.0	14.5	284	-	331
Cl (as Cl)	g/kg	21.0	1.33	6.3	24	21.0	0.96	0.34	20.4	-	21.6
Co	µg/kg	421	76.7	18.2	18	415	51.0	22.6	383	-	459
Cu	mg/kg	6.91	1.309	19.0	120	7.04	0.930	0.149	6.67	-	7.14
Fe	mg/kg	1350	203	15.1	121	1340	138	23	1310	-	1383
Hg	µg/kg	25.5	5.87	23.1	16	26.0	4.00	1.83	22.3	-	28.6
K	g/kg	30.7	1.94	6.3	134	30.7	1.31	0.21	30.33	-	30.99
Mg	g/kg	3.01	0.218	7.2	134	3.01	0.153	0.024	2.98	-	3.05
Mn	mg/kg	42.1	4.50	10.7	127	42.1	3.10	0.50	41.3	-	42.9
Mo	µg/kg	1920	275	14.3	16	1940	187	86	1770	-	2061
N - Kjeldahl (as N)	g/kg	20.2	1.16	5.8	93	20.2	0.78	0.15	19.97	-	20.45
N - NO3 (as N)	mg/kg	967	94.6	9.8	18	982	66.5	27.9	920	-	1013
Na	mg/kg	10600	1000	9.4	88	10600	690	130	10408	-	10833
P (as P)	g/kg	2.00	0.119	5.9	133	2.00	0.081	0.013	1.98	-	2.02
Pb	µg/kg	3290	655	19.9	33	3180	439	142	3055	-	3518
S (as S)	g/kg	4.77	0.451	9.5	46	4.76	0.321	0.083	4.63	-	4.90
Zn	mg/kg	25.0	2.91	11.6	130	25.0	2.00	0.32	24.5	-	25.6

Method: Real totals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
N - elementary	g/kg	21.2	1.28	6.1	29	21.0	0.91	0.30	20.7	-	21.7



Indicative Values IPE 946



Method: Inorganic Chemical Composition

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
As	µg/kg	980	290.6	29.7	11	963	197.0	109.5	787	-	1173
Ba	mg/kg	14.9	2.45	16.5	10	15.2	1.80	0.97	13.1	-	16.6
Cr	µg/kg	3510	1122	32.0	25	3420	790	281	3050	-	3970
Ni	µg/kg	1560	398	25.4	29	1500	270	92	1413	-	1715
Sr	mg/kg	47.3	7.03	14.9	12	46.4	5.14	2.54	42.9	-	51.7
V	µg/kg	2680	389	14.5	8	2730	285	172	2363	-	2997



Informative Values IPE 946



Method: Inorganic Chemical Composition

Element	Unit	Median	MAD	N
Be	µg/kg	70.0	5.00	3
F	mg/kg	13.0	7.05	4
Li	µg/kg	2320	78	5
N - NH4 (as N)	mg/kg	125	44.8	4
Sb	µg/kg	52.0	25.00	3
Se	µg/kg	114	36.5	6
SO4 (as SO4)	g/kg	10.2	0.43	4
Ti	mg/kg	30.0	20.09	3