Results of Proficiency Test
Used Lubricating Oil
May 2010

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CONTENTS

Appendices:

1   INTRODUCTION

Since 1997, a proficiency test for Lubricating Oil is organized every year by the Institute for
Interlaboratory Studies. During the annual proficiency testing program 2009/2010, it was decided
to continue the round robin for the analyses of used Lubricating Oil. In this international
interlaboratory study, 84 laboratories in 46 different countries have participated. See appendix 2 for
a list of participants in alphabetical country order. In this report, the results of the Lubricating Oil
(used oil) proficiency test are presented and discussed.

2   SET UP

The Institute for Interlaboratory Studies (i.i.s.) in Spijkenisse, The Netherlands, was the organizer
of this proficiency test. It was decided to send 2 different samples (1*500 mL (labelled #1042) and
1*50 mL (labelled #1043)) of used Lubricating Oil that was donated by one of the participating
laboratories. The analyses for fit-for-use and homogeneity were subcontracted. Participants were
requested to report rounded and unrounded results. The unrounded results were preferably used
for statistical evaluation.

2.1   ACCREDITATION

The Institute for Interlaboratory Studies in Spijkenisse, the Netherlands, is accredited in agreement
with ISO guide 43 and ILAC-G13:2007, (R007), since January 2000, by the Dutch Accreditation
Council (Raad voor Accreditatie). This ensures 100% confidentially of participant's data. Also
customer's satisfaction is measured on a regular basis by sending questionnaires.

2.2   PROTOCOL

The protocol followed in the organization of this proficiency test was the one as described for
proficiency testing in the report 'i.i.s. Interlaboratory Studies: Protocol for the Organization,
Statistics and Evaluation' of January 2010 (i.i.s.-protocol, version 3.2).

2.3   CONFIDENTIALITY STATEMENT

All data present in this report must be regarded as confidential and for use by the participating
companies only. Disclosure of the information in this report is only allowed by means of the entire
report. Use of the contents of this report for third parties is only allowed by written permission of
the Institute for Interlaboratory Studies. Disclosure of the identity of one or more of the participating
companies will be done only after receipt of a written agreement of the companies involved.

2.4   SAMPLES

In this proficiency test two different samples were used.
The necessary bulk material for the first sample, used Lubricating Oil, was donated by a third party
laboratory. The necessary 50 litre bulk material was homogenised in a precleaned 60L drum. After
homogenisation, 97 subsamples were transferred to 0.5 L brown glass bottles and labelled #1042.
The homogeneity of the subsamples #1042 was checked by determination of Density @ 20°C in

accordance with ASTM D4052:09 and Water in accordance with ASTM D6304:07 method C on 8 stratified randomly selected samples.

	Density @ 20°C in kg/L	Water in %M/M
Sample #1042-1	0.89329	0.035
Sample #1042-2	0.89321	0.038
Sample #1042-3	0.89328	0.040
Sample #1042-4	0.89326	0.038
Sample #1042-5	0.89330	0.035
Sample #1042-6	0.89329	0.036
Sample #1042-7	0.89320	0.038
Sample #1042-8	0.89323	0.037

Table 1: homogeneity test of subsamples #1042

From the above test results, the repeatabilities were calculated and compared with 0.3 times the corresponding reproducibilities in agreement with the procedure of ISO 13528, Annex B2 in the next table:

	Density @ 20 ^{o}C in kg/L	Water in %M/M
r (sample #1042)	0.00010	0.005
reference test	ASTM D4052:09	ASTM D6304:07 (C)
r (reference test)	0.00015	0.018

Table 2: repeatabilities of the subsamples #1042

The second bulk material, used Lubricating Oil fortified with several wear metals, was also obtained from a third party laboratory. The approximately 5 L bulk material was homogenised in a precleaned can. After homogenisation, 106 subsamples were transferred to 50 mL PE bottles, each filled with approximately 40 mL material and labelled #1043. The homogeneity of the subsamples #1043 was checked by the determination of Density @ 20°C in accordance with ASTM D4052:09 and Calcium and Zinc in accordance with ASTM D5185:09 on 8 stratified randomly selected samples.

	Density @ 20°C in kg/L	Calcium in mg/kg	Zinc in mg/kg
Sample #1043-1	0.89339	2990	760
Sample #1043-2	0.89338	3005	760
Sample #1043-3	0.89338	3025	775
Sample #1043-4	0.89339	2985	780
Sample #1043-5	0.89338	3000	780
Sample #1043-6	0.89337	3005	775
Sample #1043-7	0.89338	3000	775
Sample #1043-8	0.89338	3015	780

Table 3: homogeneity test of subsamples #1043

From the above test results, the repeatabilities were calculated and compared with 0.3 times the corresponding reproducibilities in agreement with the procedure of ISO 13528, Annex B2 in the next table:

	Density @ 20°C in kg/L	Calcium in mg/kg	Zinc in mg/kg
r (sample #1043)	0.00002	36	24
reference test	ASTM D4052:09	ASTM D5185:09	ASTM D5185:09
r (reference test)	0.00015	149	37

Table 4: repeatabilities of the subsamples #1042

The calculated repeatabilities are all less than 0.3 times the corresponding reproducibilities of the reference methods. Therefore, homogeneity of the subsamples #1042 and #1043 were assumed.

To each of the participating laboratories 2 samples of Lubricating Oil (1*0.5 L brown glass bottle labelled #1042, 1*50 mL PE bottle labelled #1043) were sent on April 21, 2010.

2.5 ANALYSES

The participants were requested to determine on sample #1042: Acid Number (Total), Base Number (Total), Density @ 15°C, Flash Point PMcc, Kinematic Viscosity @ 40°C and @ 100°C and Water.

On sample #1043 the participants were requested to determine 20 elements (Wear metals: Ag, Al, Ba, Cr, Cu, Fe, Pb, Li, Mg, Mn, Mo, Ni, Na, Si, Sn, Ti and V and the additives Ca, P and Zn).

To get comparable results a detailed report form, on which the units were prescribed as well as some of the required standards, was sent together with each set of samples. Also a letter of instructions and a SDS were added to the package.

3 RESULTS

During four weeks after sample despatch, the results of the individual laboratories were gathered. The original data are tabulated per determination in the appendix of this report. The laboratories are presented by their code numbers.

Directly after the deadline, a reminder fax was sent to those laboratories that had not reported results at that moment.

Shortly after the deadline, the available results were screened for suspect data. A result was called suspect in case the Huber Elimination Rule (a robust outlier test) found it to be an outlier. The laboratories that produced these suspect data were asked to check the results. Additional or corrected results are used for data analysis and original results are placed under 'Remarks' in the result tables in appendix 1.

3.1 STATISTICS

Statistical calculations were performed as described in the report 'i.i.s. Interlaboratory Studies: Protocol for the Organisation, Statistics and Evaluation' (i.i.s.-protocol, version 3.2) of January 2010. For the statistical evaluation the *unrounded* (when available) figures were used instead of the rounded results. Results reported as '<…' or '>…' were not used in the statistical evaluation.

First, the normality of the distribution of the various data sets per determination was checked by means of the Lilliefors-test. After removal of outliers, this check was repeated. Not all data sets proved to have a normal distribution, in which cases the statistical evaluation of the results should be used with due care.

In accordance to ISO 5725 (1986 and 1994) the original results per determination were submitted subsequently to Dixon and Grubbs outlier tests. Outliers are marked by D(0.01) for the Dixon test, by G(0.01) or DG(0.01) for the Grubbs test. Stragglers are marked by D(0.05) for the Dixon test, by G(0.05) or DG(0.05) for the Grubbs test. Both outliers and stragglers were not included in the calculations of averages and standard deviations.

Finally, the reproducibilities were calculated from the standard deviations by multiplying them with a factor of 2.8.

3.2 GRAPHICS

In order to visualize the data against the reproducibilities from literature, Gauss plots were made, using the sorted data for one determination (see appendix 1). On the Y-axis the reported analysis results are plotted. The corresponding laboratory numbers are under the X-axis. The straight horizontal line presents the consensus value (a trimmed mean). The four striped lines, parallel to the consensus value line, are the +3s, +2s, -2s and -3s target reproducibility limits of the selected standard. Outliers and other data, which were excluded from the calculations, are represented as a "x". Accepted data are represented as a triangle. Furthermore, Kernel Density Graphs were made. The Kernel Density is a method for producing a smooth density approximation to a set of data that avoids some problems associated with histograms (see appendix 3; nos.12 and 13).

3.3 Z-SCORES

To evaluate the performance of the participating laboratories the z-scores were calculated. As it was decided to evaluate the performance of the participants in this proficiency test (PT) against the literature requirements, e.g. ASTM reproducibilities, the z-scores were calculated using a target standard deviation. This target standard deviation was calculated from the literature reproducibility by division with 2.8. The z-scores were calculated according to:

$z_{(target)}$ = (result - average of PT) / target standard deviation

The $z_{(target)}$ scores are listed in the result tables in appendix 1.

Absolute values for z<2 are very common and absolute values for z>3 are very rare. Therefore the usual interpretation of z-scores is as follows:

$$| z | < 1 \quad \text{good}$$
$$1 < | z | < 2 \quad \text{satisfactory}$$
$$2 < | z | < 3 \quad \text{questionable}$$
$$| z | > 3 \quad \text{unsatisfactory}$$

4   EVALUATION

In this interlaboratory study, some problems were encountered with the dispatch of the samples to laboratories in Azerbaijan, Ghana, Iran, Jordan, Malaysia, Poland, Saudi Arabia, Sudan, Thailand and Turkey. Twenty-four participants reported after the final reporting date and two participants did not report any results at all. Not all laboratories were able to report all analyses requested. In total 82 participants reported 1409 results. Observed were 88 outlying results, which is 6.2% of the numerical results. In proficiency studies, outlier percentages of 3% - 7.5% are quite normal.

Not all original data sets proved to have a normal distribution. Non-Gaussian distributions were found for the following determinations: Density @ 15°C, Flash Point, Water, Lead, Nickel and Tin. In these cases the statistical evaluation should be used with due care.

4.1   EVALUATION PER TEST

In this section, the results are discussed per test. The methods, which are used by the various laboratories, are taken into account for explaining the observed differences when possible and applicable. These methods are also in the tables together with the original data. The abbreviations, used in these tables, are listed in appendix 3.

Acid Number (Total): This determination was problematic. Five statistical outliers were observed. Another nine test results were excluded from the statistical evaluation, as the reported test method is not equivalent with ASTM D664. The calculated reproducibility after rejection of the statistical outliers is not in agreement with ASTM D664:09a.

Base Number (Total): This determination was very problematic for this sample. Seven statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is not at all in agreement with ASTM D2896:07a.

Density @ 15°C: This determination was very problematic. Six statistical outliers were observed. After rejection of the statistical outliers, the reproducibility is not at all in agreement with the requirements of ASTM D4052:09.

Flash Point PMcc: This determination was very problematic. Four statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is not at all in agreement with the requirements of ASTM D93:10 procedure B.

When the results for the different modes used (ie, automatic or manual, flame or electrically) were evaluated separately, no significant differences were observed.

Kin.Visco.@ 40°C: This determination was not problematic. Five statistical outliers were observed. After rejection of the statistical outliers, the calculated reproducibility is in good agreement with the requirements of ASTM D445:09.

Kin.Visco.@ 100°C: This determination was not problematic. Eight statistical outliers were observed. After rejection of the statistical outliers, the calculated reproducibility is in good agreement with the requirements of ASTM D445:09.

Water: This determination was problematic for two laboratories. Only two statistical outliers were observed. After rejection of the statistical outliers, the calculated reproducibility is in good agreement with the requirements of ASTM D6304:07. One participant used method ASTM D1744 that was discontinued in 2000. The preferred method to use may be ASTM D6304:07 method C. This method is applicable for oils with difficult matrix interferences (presence of additives). Direct coulometric titration will lead to incorrect high results for lube oil, containing strong base additives.

Aluminium: This determination was problematic for several laboratories. Three statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in good agreement with the requirements of ASTM D5185:09.

Barium: This determination was not problematic. Three statistical outliers were observed. Although all reported results are above the application range (0.5-4 mg/kg), the calculated reproducibility after the rejection of the statistical outliers is in good agreement with the estimated extrapolated requirements of ASTM D5185:09.

Chromium: This determination was problematic. Five statistical outliers were observed and the calculated reproducibility after rejection of the statistical outliers is not in agreement with the requirements of ASTM D5185:09.

Copper: This determination was problematic. Although only one statistical outlier was observed, the calculated reproducibility after rejection of the statistical outliers is not in agreement with the requirements of ASTM D5185:09.

Iron: This determination was not problematic. Three statistical outliers were observed, but the calculated reproducibility after rejection of the statistical outlier is in full agreement with the requirements of ASTM D5185:09.

Lead: This determination was problematic for several laboratories. Five statistical outliers were observed. However, the calculated reproducibility after rejection

of the statistical outliers is in agreement with the requirements of ASTM D5185:09.

Lithium: Regretfully, for this element no test method with precision data was available, therefore, the Horwitz equation was used to estimate the reproducibility limits. This determination was not problematic. One statistical outlier was observed and the calculated reproducibility after rejection of the statistical outlier is almost in agreement with the strict estimated requirements, calculated using the Horwitz equation.

Magnesium: This determination was problematic for several laboratories. Five statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D5185:09.

Manganese: This determination was problematic. Although no statistical outliers were observed, the calculated reproducibility is not in agreement with the requirements of ASTM D5185:09.

Molybdenum: This determination was not problematic. Only one statistical outlier was observed and the calculated reproducibility after rejection of the statistical outlier is in full agreement with the requirements of ASTM D5185:09.

Nickel: This determination was problematic. Only one statistical outlier was observed, but the calculated reproducibility after rejection of the statistical outlier is not in agreement with the requirements of ASTM D5185:09.

Sodium: This determination was problematic. Five statistical outliers were observed and the calculated reproducibility after rejection of the statistical outliers is not in agreement with the requirements of ASTM D5185:09.

Silicon: This determination was problematic for several laboratories. Five statistical outliers were observed, but the calculated reproducibility after rejection of the statistical outliers is in good agreement with the requirements of ASTM D5185:09.

Silver: This determination was problematic for several laboratories. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in good agreement with the requirements of ASTM D5185:09.

Tin: This determination was not problematic. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in good agreement with the requirements of ASTM D5185:09.

Titanium: This determination was not problematic. Although, four statistical outliers were observed, the calculated reproducibility after rejection of the statistical outliers is in good agreement with the requirements of ASTM D5185:09.

Vanadium: This determination was not problematic. Only one statistical outlier was observed and the calculated reproducibility after rejection of the statistical outlier is in agreement with the requirements of ASTM D5185:09.

Calcium: This determination was problematic. Three statistical outliers were observed and the calculated reproducibility after rejection of the statistical outliers is not in agreement with the requirements of ASTM D5185:09.

Phosphorus: This determination was somewhat problematic. Only one statistical outlier was observed and the calculated reproducibility after rejection of the statistical outlier is almost in agreement with the requirements of ASTM D5185:09.

Zinc: This determination was problematic. Although, no statistical outliers were observed, the calculated reproducibility is not in agreement with the requirements of ASTM D5185:09.

As unused Lubricating Oil is a very difficult matrix to analyze, strict adherence to the test methods with regards to sample preparation, is advised. Improper sample preparation may be the cause of disagreement of the calculated reproducibility with the requirements of the respective reference standard.

4.2 **PERFORMANCE EVALUATION FOR THE GROUP OF LABORATORIES**

A comparison has been made between the reproducibility as declared by the relevant standard and the reproducibility as found for the group of participating laboratories that participated. The average results, calculated reproducibilities and reproducibilities derived from literature standards (in casu ASTM and IP standards), are compared in the next table.

Parameter	Unit	n	Average	2.8 * sd	R (lit)
Acid Number (Total)	mg KOH/g	35	4.62	2.33	2.03
Base Number (Total)	mg KOH/g	35	3.18	0.81	0.22
Density @ 15°C	kg/L	57	0.89657	0.00126	0.00050
Flash Point PMcc	^{o}C	51	190.1	28.4	10.0
Kinematic Viscosity @ 40°C	mm^2/s	68	100.555	1.462	7.441
Kinematic Viscosity @ 100°C	mm^2/s	59	12.1638	0.1807	0.8066
Water	mg/kg	46	826.3	820.0	950.5

Table 5: reproducibilities of results of sample #1042

Parameter	Unit	n	Average	2.8 * sd	R (lit)
Aluminium as Al	mg/kg	50	25.79	7.30	8.85
Barium as Ba	mg/kg	45	25.59	6.22	11.65
Chromium as Cr	mg/kg	53	24.74	7.11	5.73
Copper as Cu	mg/kg	57	36.43	10.00	8.74
Iron as Fe	mg/kg	54	29.90	8.05	7.88
Lead as Pb	mg/kg	53	30.57	8.33	10.28
Lithium as Li	mg/kg	11	26.95	7.83	7.35
Magnesium as Mg	mg/kg	49	79.78	17.12	20.98
Manganese as Mn	mg/kg	48	25.36	7.46	6.29
Molybdenum as Mo	mg/kg	46	24.14	6.29	6.14
Nickel as Ni	mg/kg	55	24.55	8.45	7.43
Sodium as Na	mg/kg	39	28.28	15.49	11.80
Silicon as Si	mg/kg	47	29.23	8.19	10.82
Silver as Ag	mg/kg	44	25.46	7.53	8.91
Tin as Sn	mg/kg	52	23.83	10.50	15.00
Titanium as Ti	mg/kg	43	23.93	5.21	11.12
Vanadium as V	mg/kg	53	24.76	7.10	9.55
Calcium as Ca	mg/kg	52	2952	575	487
Phosphorus as P	mg/kg	52	691	127	113
Zinc as Zn	mg/kg	58	792	178	128

Table 6: reproducibilities of results of sample #1043
Results between brackets were above the application range of the method, therefore the results should be evaluated with care

Without further statistical calculations it can be concluded that for a large number of tests there is a not a good compliance of the group of participants with the relevant standards. The tests, which are problematic, have been discussed in paragraph 4.1.

4.3   COMPARISON OF THE PROFICIENCY TEST OF MAY 2010 WITH PREVIOUS PTS

	May 2010	April 2009	April 2008	April 2007 *)
Number of reporting participants	82	79	86	71
Number of results reported	1409	1125	963	1644
Statistical outliers	88	74	64	84
Percentage outliers	6.2%	6.6%	6.6%	5.1%

Table 7: comparison with previous proficiency tests

*) both used and unused lubricating oil

In proficiency tests, outlier percentages of 3% - 7.5% are quite normal. The performance of the determinations of the proficiency tests was compared against the requirements of the respective standards. The conclusions are given the following table:

Determination	May 2010	April 2009	April 2008	April 2007 *)
Total Acid Number	--	-	--	+/-
Total Base Number	--	+/-	--	--
Density @ 15 °C	--	--	--	--
Flash Point PMcc	--	--	+/-	--
Kinematic Viscosity @ 40 °C	++	--	--	--
Kinematic Viscosity @ 100 °C	++	--	--	--
Water	++	--	+	--
Metals (20 elements)	+/-	+	-	+

Table 8: comparison determinations against the standard

*) both used and unused lubricating oil

The performance of the determinations against the requirements of the respective standards is listed in the above table. The following performance categories were used:

    ++:   group performed much better than the standard
    + :   group performed better than the standard
    +/-:   group performance equals the standard
    - :   group performed worse than the standard
    -- :   group performed much worse than the standard
    n.d.:   not determined
    n.e.:   not evaluated

APPENDIX 1

Determination of Acid Number (Total) on sample #1042; results in mg KOH/g

lab	method	value	mark	z(targ)	remarks
233	D974	7.373	ex	3.80	Result excluded, test method used is not equivalent
237	D974	4.4713	ex	-0.20	Result excluded, test method used is not equivalent
252		-----		-----	
254		-----		-----	
255		-----		-----	
318		-----		-----	
331	D664	4.068		-0.76	
340	D664	3.10		-2.09	
343	D664	3.78		-1.15	
353	D664	4.22		-0.55	
360	D664	4.353		-0.36	
432		-----		-----	
445	D664	4.871		0.35	
450		-----		-----	
451	D664	5.35		1.01	
473		-----		-----	
496	D664	4.644		0.04	
593		-----		-----	
609		-----		-----	
614		-----		-----	
622	D664	4.17		-0.62	
657	D664	4.76		0.20	
663		-----		-----	
840	D664	8.48	G(0.01)	5.32	
850		-----		-----	
862	D664	4.970		0.49	
875		-----		-----	
912	D664	5.660		1.44	
963	D664	3.57		-1.44	
994	D664	4.295		-0.44	
1013		-----		-----	
1017	D974	5.1754	ex	0.77	Result excluded, test method used is not equivalent
1023	D664	6.24		2.24	
1047	D664	5.60		1.35	
1059	ISO6619	4.44	ex	-0.24	Result excluded, test method used is not equivalent
1080	D664	5.40		1.08	
1094	D664	2.2257	DG(0.05)	-3.30	
1106	D664	2.3590	DG(0.05)	-3.11	
1146	D664	4.91		0.40	
1155	ISO6619	4.796	C,ex	0.25	First reported 2.398. Result excluded, test method used is not equivalent
1162		-----		-----	
1173		-----		-----	
1201	D664	3.25		-1.88	
1203	D664	5.51		1.23	
1231		-----		-----	
1234	D664	4.80		0.25	
1243		-----		-----	
1264	D664	4.8		0.25	
1278		-----		-----	
1287	D664	4.952		0.46	
1293		-----		-----	
1316	D664	3.18		-1.98	
1402	D664	5.0		0.53	
1406	D664	4.85		0.32	
1428		-----		-----	
1431	D664	6.05		1.97	
1435	D664	4.38		-0.33	
1526		-----		-----	
1535		-----		-----	
1540	D664	4.028		-0.81	
1543		-----		-----	
1613		-----		-----	
1620	D664	4.92		0.42	
1648		-----		-----	
1650	D664	4.71		0.13	
1652		-----		-----	
1660	IEC-62021-1	3.888		-1.01	
1708	D974	4.134	ex	-0.67	Result excluded, test method used is not equivalent
1720	D664	1.50	DG(0.05)	-4.30	
1722		-----		-----	
1730		-----		-----	
1800		-----		-----	
1825		-----		-----	
1827		-----		-----	

1833	D664	0.23	DG(0.05)	-6.05	
1842		-----		-----	
1850	ISO6619	4.84	ex	0.31	Result excluded, test method used is not equivalent
1900	D664	3.01		-2.22	
1903	inh-08	4.45		-0.23	
1948		-----		-----	
2122	IP177	5.562	ex	1.30	Result excluded, test method used is not equivalent
2133	D664	5.8730		1.73	
2160	EN14104	3.371	ex	-1.72	Result excluded, test method used is not equivalent
4091		-----		-----	
7003		-----		-----	

normality	OK
n	35
outliers	5
mean (n)	4.617
st.dev. (n)	0.8305
R(calc.)	2.325
R(D664:09a)	2.032
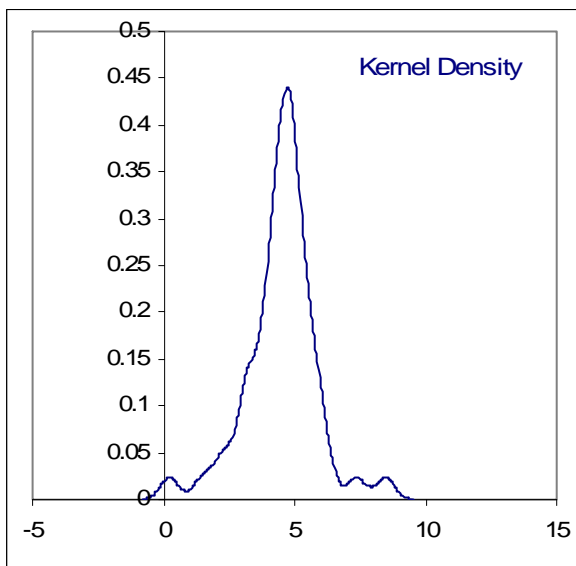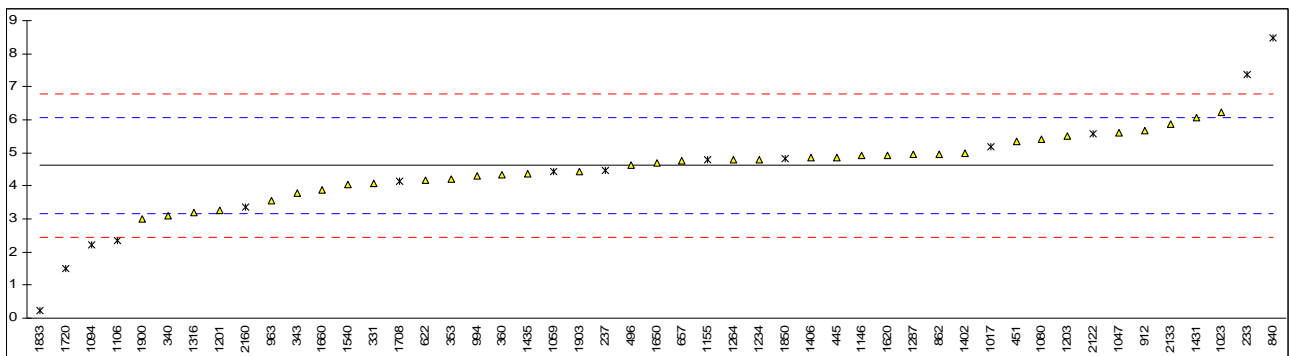
Determination of Base Number (Total) on sample #1042; results in mg KOH/g

lab	method	value	mark	z(targ)	remarks
233	D974	5.59	G(0.01)	30.35	
237	D2896	7.16	G(0.01)	50.11	
252	D2896	2.833		-4.34	
254		-----		-----	
255		-----		-----	
318		-----		-----	
331	D2896	3.233		0.69	
340	D2896	3.32		1.78	
343	D4739	0.65	C,G(0.01)	-31.82	First reported 1.99
353		-----		-----	
360	D2896	3.152		-0.33	
432	D2896	3.196		0.22	
445	D2896	3.34		2.04	
450		-----		-----	
451	D2896	3.20		0.27	
473	D2896Mod	7.5810	G(0.01)	55.41	
496	D2896	2.984		-2.44	
593	D2896	2.7441	C	-5.46	First reported 16.92
609		-----		-----	
614	D2896	2.91		-3.38	
622	D2896	3.53		4.43	
657	D2896	3.33		1.91	
663		-----		-----	
840	D2896	3.280		1.28	
850		-----		-----	
862	D2896	3.189		0.14	
875		-----		-----	
912	D2896	3.120		-0.73	
963	D2896	3.96		9.84	
994		-----		-----	
1013		-----		-----	
1017		-----		-----	
1023	D2896	3.43		3.17	
1047	ISO3771	3.27		1.16	
1059		-----		-----	
1080	D2896	1.66	G(0.01)	-19.11	
1094		-----		-----	
1106		-----		-----	
1146	D2896	3.17		-0.10	
1155	ISO3771	3.382		2.56	
1162		-----		-----	
1173		-----		-----	
1201	D2896	16.75	G(0.01)	170.81	
1203		-----		-----	
1231		-----		-----	
1234	D2896	3.00		-2.24	
1243	D2896	3.1		-0.98	
1264		-----		-----	
1278		-----		-----	
1287	D2896	3.197		0.24	
1293		-----		-----	
1316		-----		-----	
1402	D2896	3.2		0.27	
1406	D2896	2.91		-3.38	
1428		-----		-----	
1431	D2896	3.08		-1.24	
1435		-----		-----	
1526		-----		-----	
1535		-----		-----	
1540	D2896	3.582		5.08	
1543		-----		-----	
1613		-----		-----	
1620	D2896	3.305		1.60	
1648	D2896	2.43		-9.42	
1650	D2896	3.25		0.90	
1652		-----		-----	
1660		-----		-----	
1708	D2896	3.59		5.18	
1720		-----		-----	
1722		-----		-----	
1730		-----		-----	
1800		-----		-----	
1825	D2896	2.7	C	-6.02	First reported 2.12
1827		-----		-----	

1833		-----		-----
1842		-----		-----
1850	ISO3771	3.47		3.67
1900	D2896	2.98		-2.49
1903		-----		-----
1948		-----		-----
2122	IP400	1.64	G(0.05)	-19.36
2133	D2896	2.87		-3.88
2160		-----		-----
4091		-----		-----
7003		-----		-----

normality	OK
n	35
outliers	7
mean (n)	3.18
st.dev. (n)	0.289
R(calc.)	0.81
R(D2896:07a)	0.22

Kernel Density
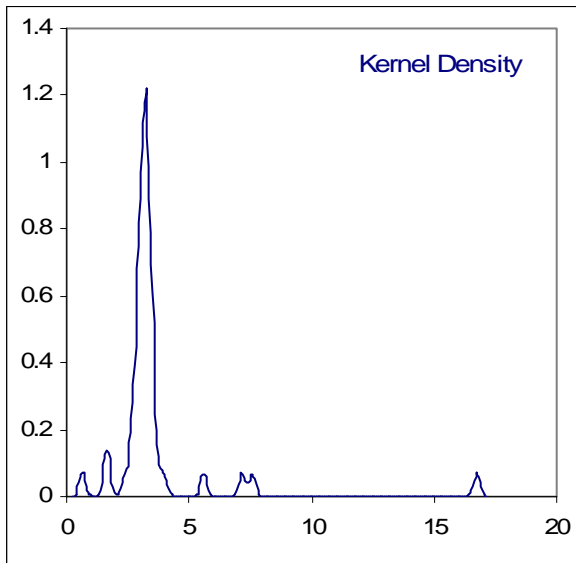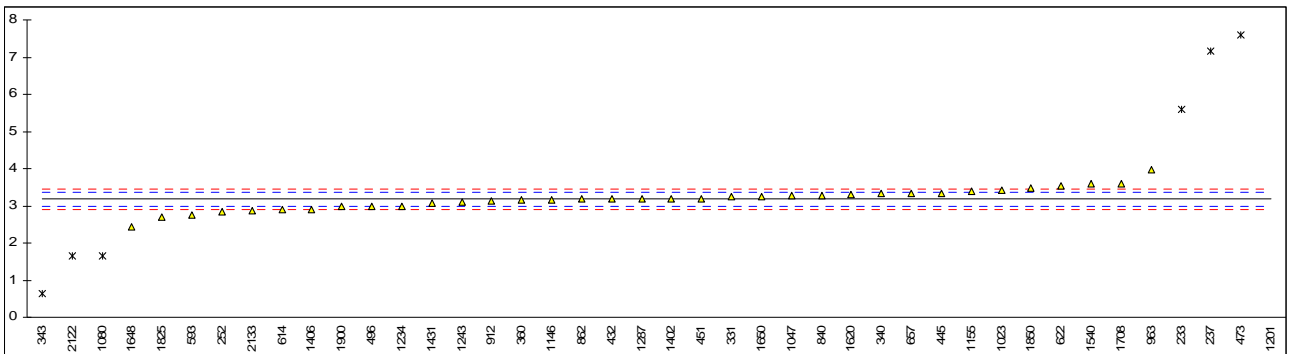
Determination of Density @ 15°C on sample #1042; results in kg/L

lab	method	value	mark	z(targ)	remarks
233	D4052	0.9082	C,G(0.01)	65.16	
237		-----		-----	
252		-----		-----	
254		-----		-----	
255		-----		-----	
318		-----		-----	
331		-----		-----	
340	D4052	0.8971	C	3.00	Reported 897.12 kg/m^3
343	D4052	0.89653	C	-0.19	First reported 0.89395
353	D4052	0.8964	C	-0.92	Reported 896.4 kg/m^3
360	D4052	0.8962	C	-2.04	First reported 0.8939
432	D4052	0.89673		0.93	
445	D4052	0.8971		3.00	
450		-----		-----	
451	D4052	0.896		-3.16	
473	D4052	0.8963		-1.48	
496	D4052	0.89639		-0.98	
593		-----		-----	
609	D4052	0.8964		-0.92	
614	D4052	0.8970		2.44	
622	D4052	0.8964		-0.92	
657	D4052	0.8964	C	-0.92	First reported 0.8991
663	D4052	0.8964		-0.92	
840	D4052	0.89648		-0.47	
850	D4052	0.8972		3.56	
862	D4052	0.89646		-0.59	
875	D4052	0.8967		0.76	
912	D4052	0.8965		-0.36	
963		-----		-----	
994	D4052	0.8935	G(0.01)	-17.16	
1013	D4052	0.8966		0.20	
1017	D4052	0.8971		3.00	
1023	D4052	0.8965		-0.36	
1047	D4052	0.8969		1.88	
1059	D4052	0.8966	C	0.20	Reported 896.6 kg/m^3
1080	ISO12185	0.8965		-0.36	
1094	D4052	0.89657		0.03	
1106	D5002	0.8966		0.20	
1146	D4052	0.89581		-4.23	
1155	ISO3675	0.8966		0.20	
1162		-----		-----	
1173		-----		-----	
1201	D4052	0.8970		2.44	
1203	ISO12185	0.8963	C	-1.48	First reported 0.8957
1231		-----		-----	
1234	D1298	0.8972		3.56	
1243	D4052	0.8972		3.56	
1264	D4052	0.8964		-0.92	
1278		-----		-----	
1287	D4052	0.89614		-2.38	
1293	D5002	0.8939	G(0.01)	-14.92	
1316		-----		-----	
1402	IP365	0.8970		2.44	
1406	ISO12185	0.89650		-0.36	
1428	D4052	0.8965		-0.36	
1431	D4052	0.89639		-0.98	
1435	D4052	0.897		2.44	
1526	D5002	0.894	G(0.01)	-14.36	
1535	ISO3675	0.89660		0.20	
1540		-----		-----	
1543		-----		-----	
1613		-----		-----	
1620	D4052	0.8966		0.20	
1648	D1298	0.89710		3.00	
1650	D4052	0.8955		-5.96	
1652		-----		-----	
1660	D4052	0.8964		-0.92	
1708	D4052	0.8969		1.88	
1720	D4052	0.8961		-2.60	
1722	D4052	0.8973		4.12	
1730		-----		-----	
1800	in house	0.8957		-4.84	
1825	D1298	0.8952	C	-7.64	First reported 0.8947
1827		-----		-----	

1833	D4052	0.8962	C	-2.04	Reported 896.2 kg/m^3
1842	IP365	0.8971		3.00	
1850	D4052	0.8965	C	-0.36	Reported 896.5 kg/m^3
1900	in house	0.89	G(0.01)	-36.76	
1903		-----		-----	
1948	ISO12185	0.8965		-0.36	
2122		-----		-----	
2133	D4052	0.8959	C	-3.72	Reported 895.9 kg/m^3
2160	ISO12185	0.89728		4.01	
4091	D4052	0.886	C,G(0.01)	-59.16	First reported 0.89
7003	D4052	0.8972		3.56	

normality	not OK
n	57
outliers	6
mean (n)	0.89657
st.dev. (n)	0.000449
R(calc.)	0.00126
R(D4052:09)	0.00050
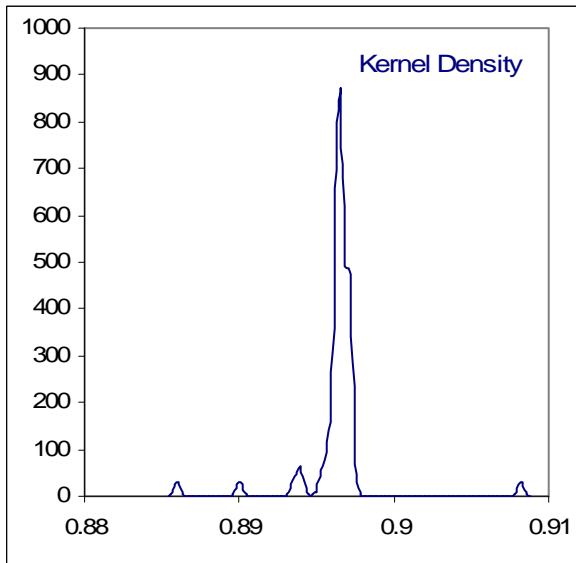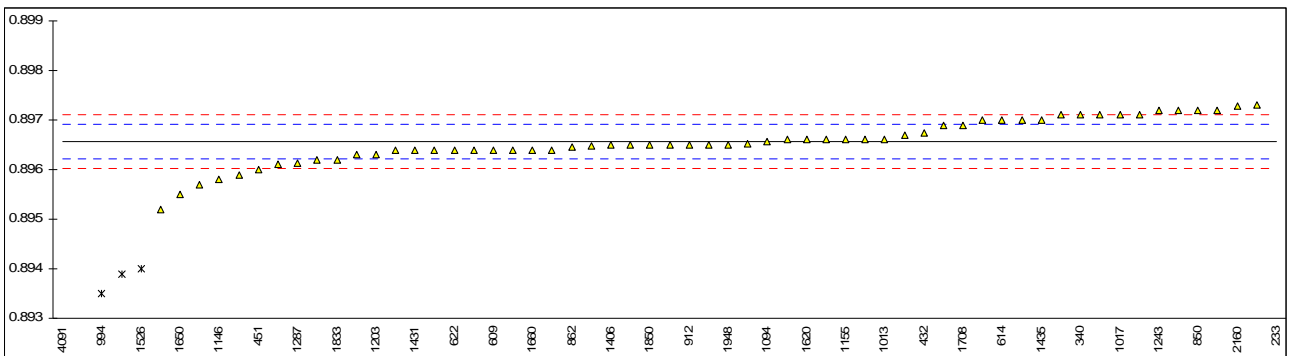
Determination of Flash Point PMcc on sample #1042; results in °C

lab	method	value	mark	z(targ)	remarks
233	D93-	190		-0.02	
237	D93-	176.0		-3.94	
252		-----		-----	
254		-----		-----	
255		-----		-----	
318	inh-2/111/c	188.5		-0.44	
331	D93-AE	220	DG(0.05)	8.38	
340	D93-AF	208		5.02	
343	D93-AE	176.0		-3.94	
353	IP34-ME	188.0		-0.58	
360	D93-AE	185.0		-1.42	
432	D93-AE	187.6		-0.70	
445	D93-	187.5		-0.72	
450		-----		-----	
451		-----		-----	
473	D93-AE	181		-2.54	
496		-----		-----	
593	D93-ME	205	C	4.18	First reported 215
609	D3828	195.5		1.52	
614	D93-MF	182.1		-2.24	
622	D93-MF	204.0		3.90	
657	D93-AF	185.5		-1.28	
663	D93-MF	186.0		-1.14	
840	D93-MF	174.0		-4.50	
850	D93-MF	198.0		2.22	
862	D93-MF	177.1		-3.64	
875	D93-AF	174.0		-4.50	
912	D93-AF	183		-1.98	
963	D93-AE	183.5		-1.84	
994		-----		-----	
1013		-----		-----	
1017	D93-AF	179.0		-3.10	
1023	D93-AE	201		3.06	
1047	ISO2719-AF	205		4.18	
1059	ISO2719-AE	185.0		-1.42	
1080	D93-AE	193.5		0.96	
1094		-----		-----	
1106	D93-AE	186.0		-1.14	
1146	in house-AE	194.2		1.15	
1155	ISO2719-MF	183.25		-1.91	
1162	D93-F	182	C	-2.26	First reported 169.02
1173	IP34-MF	189.13		-0.27	
1201	D93-AE	181		-2.54	
1203	ISO2719-AF	186		-1.14	
1231		-----		-----	
1234	D93-AM	178.0		-3.38	
1243	D93-AF	204		3.90	
1264	D92-AE	210		5.58	
1278		-----		-----	
1287	D93-AE	200.0		2.78	
1293	D6450-AE	191		0.26	
1316		-----		-----	
1402	D93-AE	185.0		-1.42	
1406		-----		-----	
1428		-----	W	-----	Result withdrawn, wrong sample analyzed
1431	D93-AF	184.6		-1.54	
1435	D93-AE	12.3	G(0.01)	-49.78	
1526		-----		-----	
1535	ISO2719-ME	208.78		5.23	
1540		-----		-----	
1543		-----		-----	
1613		-----		-----	
1620	D93-AE	216.0	DG(0.05)	7.26	
1648	D93-	206.11		4.49	
1650		-----		-----	
1652	ISO27-19	190.14		0.01	
1660		-----		-----	
1708	D93-AE	209.5		5.44	
1720		-----		-----	
1722		-----		-----	
1730		-----		-----	
1800		-----		-----	
1825		-----		-----	
1827		-----		-----	

1833	D93-AF	184		-1.70	
1842		-----		-----	
1850	ISO2719AE	202		3.34	
1900	D93-AF	186		-1.14	
1903		-----		-----	
1948	D93-AE	186.0		-1.14	
2122	D93-MF	190	C	-0.02	First reported 144
2133	D93-AE	199		2.50	
2160	D93-MF	161.3	G(0.01)	-8.06	
4091		-----		-----	
7003		-----		-----	

			Only MF	Only ME	Only AF	Only AE
	normality	not OK	OK	n.a.	not OK	OK
	n	51	9	3	11	19
	outliers	4	1	0	0	3
	mean (n)	190.1	187.1	200.6	189.0	191.4
	st.dev. (n)	10.15	9.55	11.07	11.30	9.814
	R(calc.)	28.4	26.7	31.0	31.6	27.5
	R(D93:10)	10.0	10.0	10.0	10.0	10.0

A	= automated mode	M	= manual mode
AE	= automated mode / electric ignition	ME	= manual mode / electric ignition
AF	= automated mode / flame ignition	MF	= manual mode / flame ignition
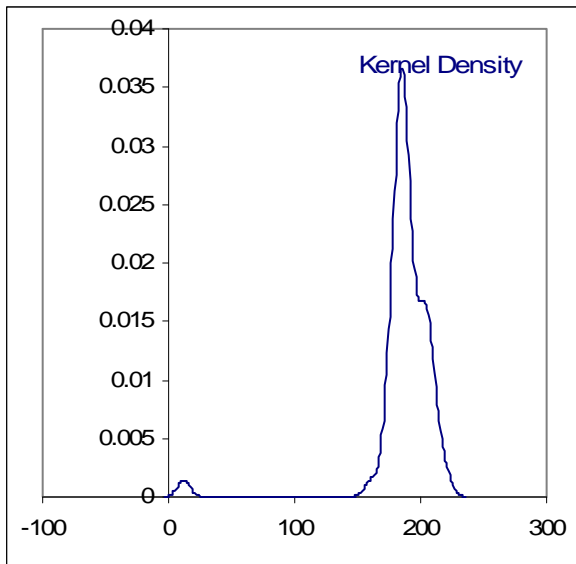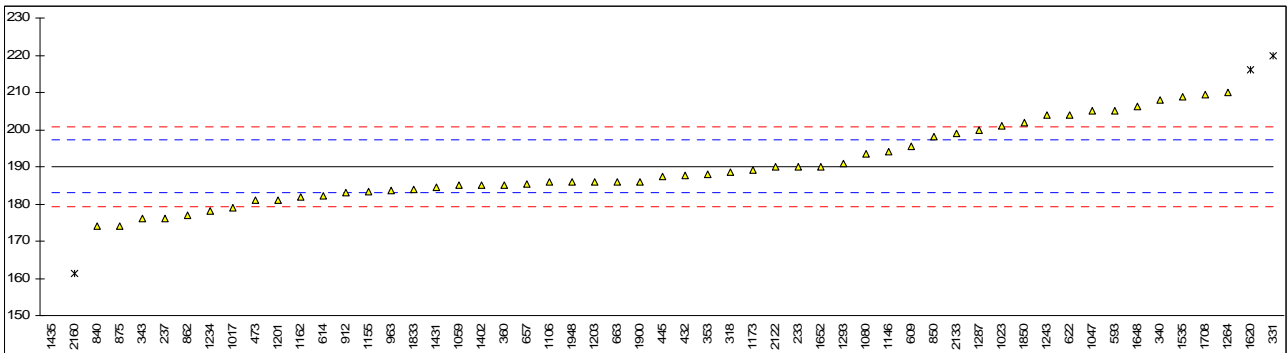
Determination of Kinematic Viscosity @ 40°C on sample #1042; results in mm^2/s

lab	method	value	mark	z(targ)	Remarks
233	D445	99.78		-0.29	
237	D445	100.07		-0.18	
252		-----		-----	
254		-----		-----	
255		-----		-----	
318		-----		-----	
331	in house	100.15		-0.15	
340	D445	101.16		0.23	
343	D445	100.51		-0.02	
353	D445	100.53		-0.01	
360	D445	101.08		0.20	
432	D445	100.3		-0.10	
445	D445	99.90		-0.25	
450		-----		-----	
451		-----		-----	
473	D445	100.77		0.08	
496	D445	100.83		0.10	
593	D445	100.90		0.13	
609	D7042	100.41		-0.05	
614	D445	99.17	G(0.05)	-0.52	
622	D445	101.4		0.32	
657	D445	101.6		0.39	
663		-----		-----	
840	D445	100.20		-0.13	
850	D445	101.22	C	0.25	First reported 98.814
862	D445	101.3	C	0.28	First reported 104.34
875	D445	100.7		0.05	
912	D445	102.20	DG(0.05)	0.62	
963	D445	99.703		-0.32	
994	D445	101.64		0.41	
1013	D445	100.9		0.13	
1017	D445	100.7057		0.06	
1023	D445	99.96		-0.22	
1047	ISO3104	100.14		-0.16	
1059	ISO3104	99.99		-0.21	
1080	ISO3104	100.4		-0.06	
1094	D445	100.9507		0.15	
1106	D445	100.4		-0.06	
1146	D445	100.44		-0.04	
1155	ISO3104	99.74		-0.31	
1162	D445	100.70		0.05	
1173	IP71	100.63		0.03	
1201	D445	100.2		-0.13	
1203	ISO3104	100.8		0.09	
1231		-----		-----	
1234	D445	101.302		0.28	
1243	D445	100.75		0.07	
1264	D7042	100.2		-0.13	
1278		-----		-----	
1287	D445	100.3		-0.10	
1293	ISO3104	95.31	G(0.01)	-1.97	
1316	D445	100.6		0.02	
1402	D445	100.9		0.13	
1406	D445	100.6		0.02	
1428	ISO3104	100.7		0.05	
1431	D7042	100.8		0.09	
1435	D445	101.1		0.21	
1526	D445	100.05		-0.19	
1535	ISO3104	100.90	C	0.13	First reported 102.71
1540	D445	99.848		-0.27	
1543		-----		-----	
1613	D445	100.24		-0.12	
1620	D445	100.3		-0.10	
1648	D445	101.66		0.42	
1650	D445	102.03	DG(0.05)	0.56	
1652	D445	100.53		-0.01	
1660	D445	100.43		-0.05	
1708	D445	99.864		-0.26	
1720	D445	98.03	G(0.01)	-0.95	
1722	D445	100.2154		-0.13	
1730		-----		-----	
1800		-----		-----	
1825	D445	100.77	C	0.08	First reported 102.35
1827	D445	100.765		0.08	

1833	D445	99.885	-0.25
1842	IP71	99.80	-0.28
1850	ISO3104	101.7	0.43
1900	D445	99.76	-0.30
1903	inh-08	100.4916	-0.02
1948	D445	100.76	0.08
2122	in house	100.756	0.08
2133	D445	100.0	-0.21
2160	D445	100.9	0.13
4091	D445	101.13	0.22
7003	D7042	99.615	-0.35

normality	OK
n	68
outliers	5
mean (n)	100.555
st.dev. (n)	0.5222
R(calc.)	1.462
R(D445:09)	7.441
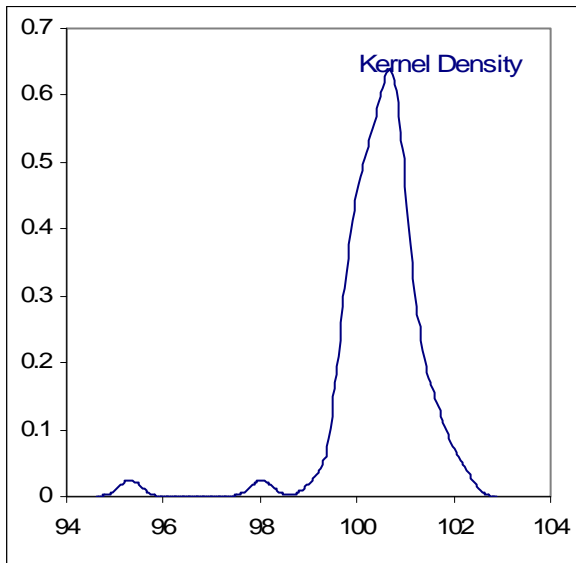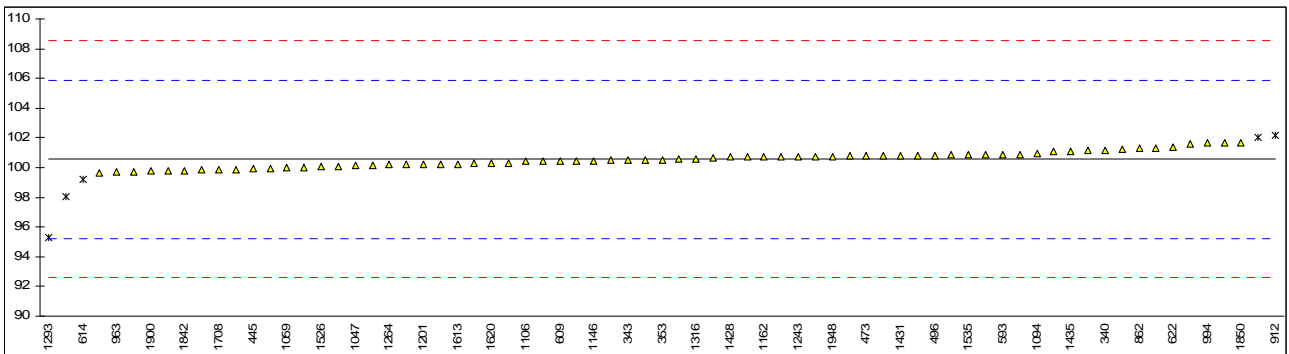
Determination of Kinematic Viscosity @ 100°C on sample #1042; results in mm^2/s

lab	method	value	mark	z(targ)	remarks
233	D445	12.66	G(0.05)	1.72	
237	D445	12.192		0.10	
252	D445	11.4798	G(0.01)	-2.37	
254		-----		-----	
255		-----		-----	
318		-----		-----	
331	in house	12.070		-0.33	
340	D445	11.992		-0.60	
343	D445	12.093		-0.25	
353	D445	12.164		0.00	
360	D445	12.149	C	-0.05	First reported 11.989
432	D445	12.16		-0.01	
445	D445	12.15		-0.05	
450	D445	12.20		0.13	
451		-----		-----	
473	D445	12.213		0.17	
496	D445	12.146		-0.06	
593	D445	12.156		-0.03	
609	D7042	12.264		0.35	
614	D445	12.16		-0.01	
622	D445	12.17		0.02	
657	D445	12.17		0.02	
663		-----		-----	
840	D445	12.094		-0.24	
850	D445	12.107	C	-0.20	First reported 12.487
862	D445	12.208		0.15	
875	D445	12.11		-0.19	
912	D445	12.280		0.40	
963		-----		-----	
994	D445	12.159		-0.02	
1013	D445	12.17		0.02	
1017	D445	12.2248		0.21	
1023	D445	12.11		-0.19	
1047	ISO3104	12.086		-0.27	
1059	ISO3104	12.13		-0.12	
1080	ISO3104	12.14		-0.08	
1094		-----		-----	
1106		-----		-----	
1146	D445	12.140		-0.08	
1155	ISO3104	12.134		-0.10	
1162	D445	11.948	G(0.05)	-0.75	
1173		-----		-----	
1201	D445	12.20		0.13	
1203	ISO3104	12.29		0.44	
1231		-----		-----	
1234	D445	12.090		-0.26	
1243	D445	12.20		0.13	
1264	D7042	12.24		0.26	
1278		-----		-----	
1287	D445	12.03		-0.46	
1293	ISO3104	11.79	G(0.05)	-1.30	
1316	D445	12.13		-0.12	
1402	D445	12.22		0.20	
1406	D445	12.14		-0.08	
1428		-----	W	-----	Result withdrawn, wrong sample analyzed
1431	D7042	12.21		0.16	
1435	D445	12.3		0.47	
1526		-----		-----	
1535	ISO3104	12.188		0.08	
1540	D445	11.844	DG(0.01)	-1.11	
1543		-----		-----	
1613	D445	12.217		0.18	
1620	D445	12.05		-0.39	
1648	D445	11.907	DG(0.05)	-0.89	
1650	D445	12.10	C	-0.22	First reported 12.395
1652	D445	12.104		-0.21	
1660	D445	12.233		0.24	
1708	D445	12.143		-0.07	
1720	D445	11.91	DG(0.05)	-0.88	
1722		-----		-----	
1730		-----		-----	
1800		-----		-----	
1825	D445	12.24		0.26	
1827		-----		-----	

1833	D445	12.17		0.02	
1842	IP71	12.16		-0.01	
1850	ISO3104	12.25		0.30	
1900	D445	12.2		0.13	
1903	inh-08	12.1440		-0.07	
1948	D445	12.18		0.06	
2122	in house	12.30		0.47	
2133	D445	12.13		-0.12	
2160	D445	12.15		-0.05	
4091	D445	11.84	C,DG(0.01)	-1.12	First reported 12.4
7003	D7042	12.112		-0.18	

normality	OK
n	59
outliers	8
mean (n)	12.1638
st.dev. (n)	0.06452
R(calc.)	0.1807
R(D445:09)	0.8066
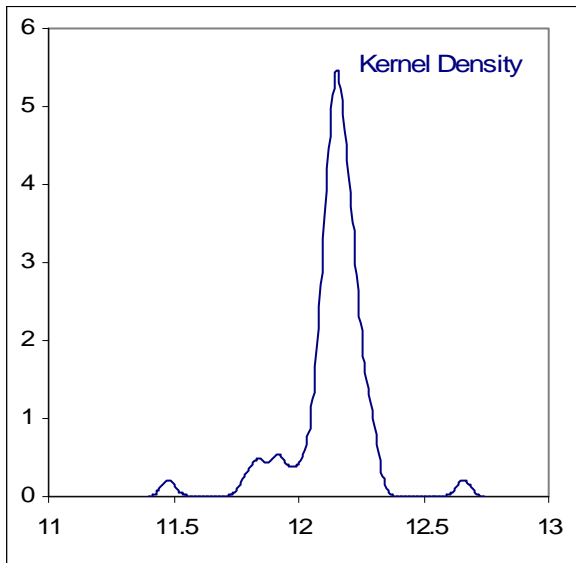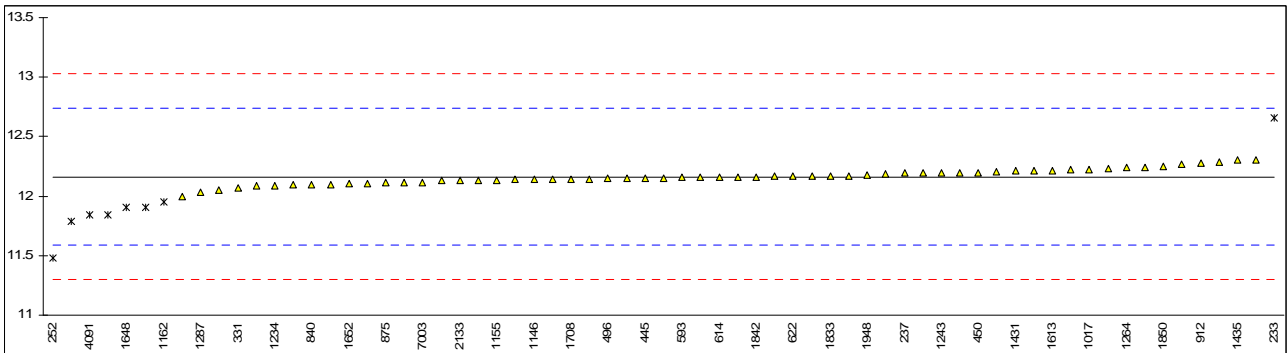
Determination of Water on sample #1042; results in mg/kg

lab	method	value	mark	z(targ)	remarks
233	in house	800	C	-0.08	Reported 0.08 %M/M
237		-----		-----	
252		-----		-----	
254	D95	<1000		-----	
255		-----		-----	
318	inh-2	1000		0.51	
331	D6304	825.3		0.00	
340		-----		-----	
343	E203	1450		1.84	
353	IP439	891		0.19	
360		-----		-----	
432		-----		-----	
445	D6304	162		-1.96	
450		-----		-----	
451	D6304	441	C	-1.14	Reported 0.0441 %M/M
473	D6304	777.2		-0.14	
496	D6304	739.2		-0.26	
593		-----		-----	
609		-----		-----	
614	D6304	1000.6		0.51	
622		-----		-----	
657	D6304	1025	C	0.59	First reported 2360.1
663		-----		-----	
840	D6304	880		0.16	
850	D6304	841.1		0.04	
862	D6304	1021.0		0.57	
875		-----		-----	
912	D6304	808.0		-0.05	
963	D6304	1172		1.02	
994		-----		-----	
1013		-----		-----	
1017		-----		-----	
1023	D6304	805		-0.06	
1047	D95	997		0.50	
1059	in house	570		-0.76	
1080		-----		-----	
1094		-----		-----	
1106		-----		-----	
1146	D6304	966		0.41	
1155	D6304	448.7		-1.11	
1162	D6304	894.9		0.20	
1173	in house	726		-0.30	
1201	D6304	1100		0.81	
1203	ISO12937	487		-1.00	
1231		-----		-----	
1234	D6304	356.5		-1.38	
1243	D6304	1570		2.19	
1264		-----		-----	
1278		-----		-----	
1287	D6304	600.1		-0.67	
1293	ISO12937	986.6		0.47	
1316	D6304	830		0.01	
1402	D6304	704		-0.36	
1406	D1744	3320	C,G(0.01)	7.35	First reported 1780
1428		-----		-----	
1431	D6304	966		0.41	
1435	D6304	915		0.26	
1526	D4377	<5000		-----	
1535		-----		-----	
1540	E203	1063		0.70	
1543		-----		-----	
1613		-----		-----	
1620	D6304	720		-0.31	
1648	D6304	240		-1.73	
1650	D6304	869.0		0.13	
1652		-----		-----	
1660	IEC 60814	695		-0.39	
1708	D6304	975		0.44	
1720		-----		-----	
1722		-----		-----	
1730		-----		-----	
1800		-----		-----	
1825		-----		-----	
1827	D6304	725.5		-0.30	

1833	D6304	1045		0.64
1842		-----		-----
1850		-----		-----
1900	D6304	962		0.40
1903		-----		-----
1948	D6304	802.20		-0.07
2122	IP396	150		-1.99
2133	D6304	687.1		-0.41
2160	ISO12937	3359	G(0.01)	7.46
4091	D6304	1320	C	1.45
7003		-----		-----

normality	OK
n	46
outliers	2
mean (n)	826.3
st.dev. (n)	292.86
R(calc.)	820.0
R(D6304:07)	950.5
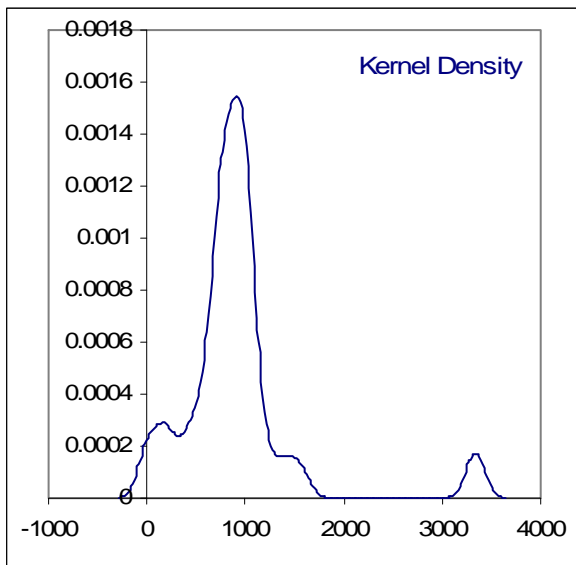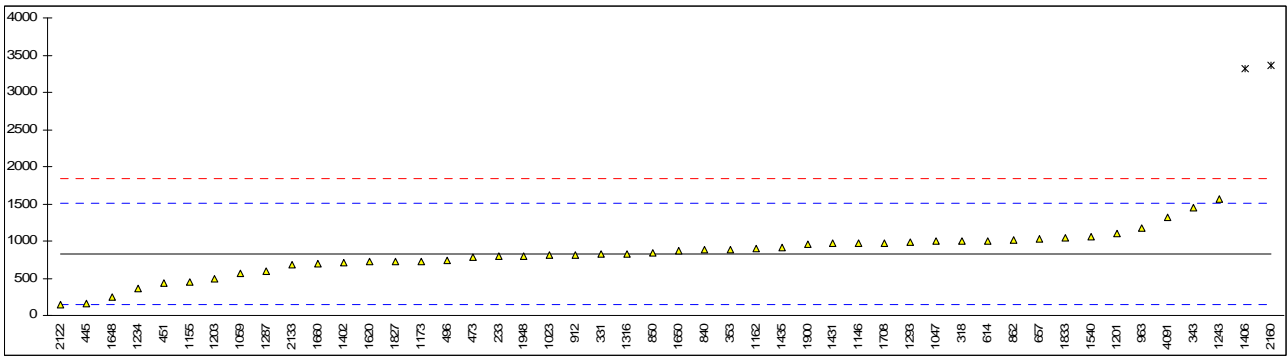
Determination of Aluminium (Al) on sample #1043; results in mg/kg

lab	method	value	mark	z(targ)	remarks
233	in house	27.10		0.41	
237		-----		-----	
252		-----		-----	
254		-----		-----	
255		-----		-----	
318		-----		-----	
331	D5185	25.00		-0.25	
340	D5185	31		1.65	
343	D5185	22		-1.20	
353		-----		-----	
360	D5185	27.4		0.51	
432		-----		-----	
445	D5185	26		0.07	
450		-----		-----	
451	D5185	25.3		-0.16	
473	D5185Mod	26.2029		0.13	
496	D5185	23.7		-0.66	
593		-----		-----	
609	D5185	23		-0.88	
614	D5185	27.2		0.45	
622	D5185	25.92		0.04	
657	D5185	24.5		-0.41	
663		-----		-----	
840		-----		-----	
850		-----		-----	
862	D5185	28.0		0.70	
875		-----		-----	
912	D5185	28		0.70	
963	D5185	27.42		0.51	
994	D5185	27.61		0.58	
1013		-----		-----	
1017	D5185	25.8		0.00	
1023	D5185	27.7		0.60	
1047	D5185	25		-0.25	
1059	in house	27		0.38	
1080	D5185	22		-1.20	
1094	D5185	24.4		-0.44	
1106		-----		-----	
1146	D5185	24.37		-0.45	
1155		-----		-----	
1162	D6595	36.4	G(0.05)	3.36	
1173	in house	27.5		0.54	
1201	D5185	27		0.38	
1203	D5185	23		-0.88	
1231		-----		-----	
1234	in house	28		0.70	
1243	D5185	28.0		0.70	
1264	D6595	37.68	G(0.05)	3.76	
1278	D5185	27.2		0.45	
1287	D6595	31.2		1.71	
1293	D6595	28.588		0.88	
1316	D5185	20.4		-1.71	
1402	D5185	22		-1.20	
1406		-----		-----	
1428	D5185	25		-0.25	
1431	in house	29.9		1.30	
1435	D5185	25		-0.25	
1526		-----		-----	
1535		-----		-----	
1540		-----		-----	
1543		-----		-----	
1613		-----		-----	
1620	D5185	25		-0.25	
1648	D5185	24.82		-0.31	
1650		-----		-----	
1652		-----		-----	
1660	D5185	20.15		-1.79	
1708	D5185	30.4		1.46	
1720		-----		-----	
1722		-----		-----	
1730	D5185	24.908		-0.28	
1800	in house	27.7		0.60	
1825		-----		-----	
1827		-----		-----	

1833		-----		-----
1842	in house	27.2		0.45
1850		-----		-----
1900	D6595	25.86272		0.02
1903	inh-74	22.93		-0.91
1948	D5185	22.79		-0.95
2122	D5185	27.45		0.52
2133	D5185	20.642		-1.63
2160	D5185	25.4		-0.12
4091		-----		-----
7003	D3919	15.7	G(0.05)	-3.19

	normality	OK
	n	50
	outliers	3
	mean (n)	25.79
	st.dev. (n)	2.606
	R(calc.)	7.30
	R(D5185:09)	8.85
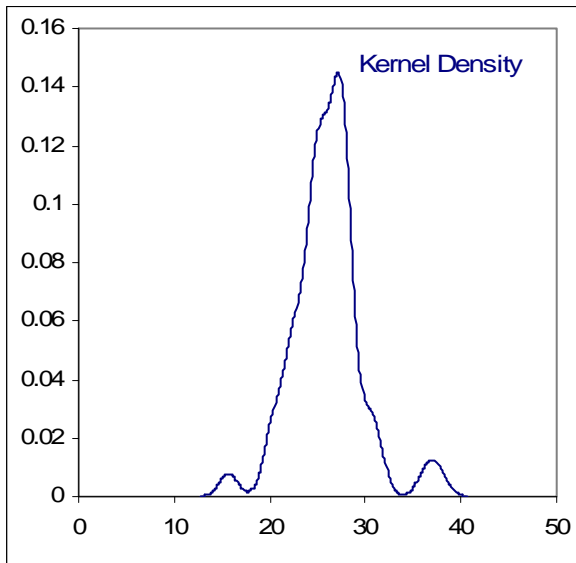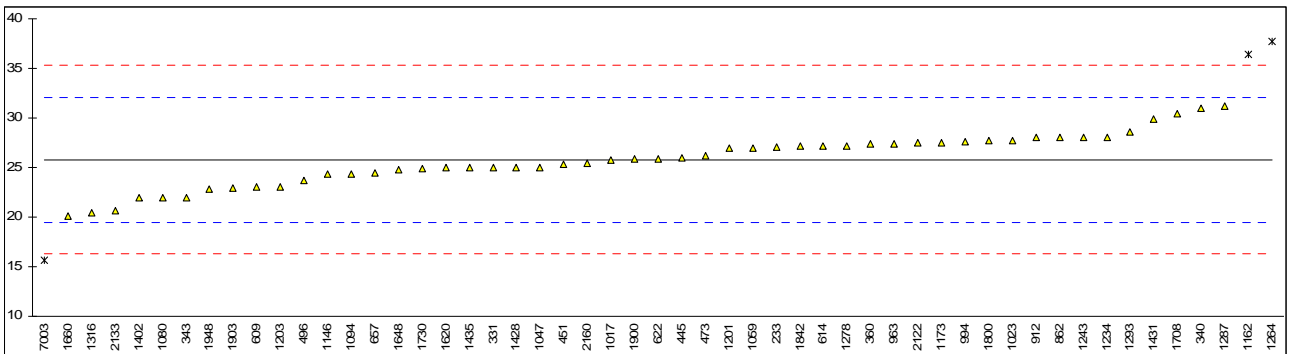
Determination of Barium (Ba) on sample #1043; results in mg/kg

lab	method	value	mark	z(targ)	remarks
233	in house	28.02		0.59	
237		-----		-----	
252		-----		-----	
254		-----		-----	
255		-----		-----	
318		-----		-----	
331	D5185	27.44		0.45	
340	D5185	34	DG(0.05)	2.02	
343	D5185	23		-0.62	
353		-----		-----	
360	D5185	23.4		-0.53	
432		-----		-----	
445	D5185	28		0.58	
450		-----		-----	
451	D5185	28.1		0.60	
473	D5185Mod	26.7276		0.27	
496	D5185	24.5		-0.26	
593		-----		-----	
609	D5185	27		0.34	
614	D5185	25.7		0.03	
622	D5185	31.27		1.37	
657	D5185	25.6		0.00	
663		-----		-----	
840		-----		-----	
850		-----		-----	
862	D5185	27.0		0.34	
875		-----		-----	
912	D5185	24		-0.38	
963	D5185	26.19		0.15	
994	D5185	29.94		1.05	
1013		-----		-----	
1017	D5185	26.0		0.10	
1023	D5185	26.7		0.27	
1047	D5185	23.6		-0.48	
1059		-----		-----	
1080	D5185	22		-0.86	
1094	D5185	26.6		0.24	
1106		-----		-----	
1146	D5185	25.56		-0.01	
1155		-----		-----	
1162	D6595	23.8		-0.43	
1173	in house	27.2		0.39	
1201	D5185	26		0.10	
1203	D5185	22		-0.86	
1231		-----		-----	
1234		-----		-----	
1243	D5185	26.0		0.10	
1264	D6595	35.49	G(0.05)	2.38	
1278	D5185	27.4		0.44	
1287		-----		-----	
1293	D6595	31.606	DG(0.05)	1.45	
1316	D5185	21.7		-0.93	
1402	D5185	23		-0.62	
1406		-----		-----	
1428	D5185	24		-0.38	
1431	in house	28.4		0.68	
1435	D5185	26		0.10	
1526		-----		-----	
1535		-----		-----	
1540		-----		-----	
1543		-----		-----	
1613		-----		-----	
1620	D5185	26		0.10	
1648		-----		-----	
1650		-----		-----	
1652		-----		-----	
1660	D5185	21.9		-0.89	
1708	D5185	26.1	C	0.12	First reported 44.2
1720		-----		-----	
1722		-----		-----	
1730	D5185	23.620		-0.47	
1800	in house	27.0		0.34	
1825		-----		-----	
1827		-----		-----	

1833		-----	-----
1842	in house	27.3	0.41
1850	in house	23	-0.62
1900	D6595	27.47175	0.45
1903	inh-74	22.39	-0.77
1948	D5185	23.22	-0.57
2122	D5185	26.4	0.20
2133		-----	-----
2160	D5185	25.11	-0.11
4091		-----	-----
7003		-----	-----

normality	OK	
n	45	
outliers	3	
mean (n)	25.59	
st.dev. (n)	2.222	
R(calc.)	6.22	
R(D5185:09)	11.65	
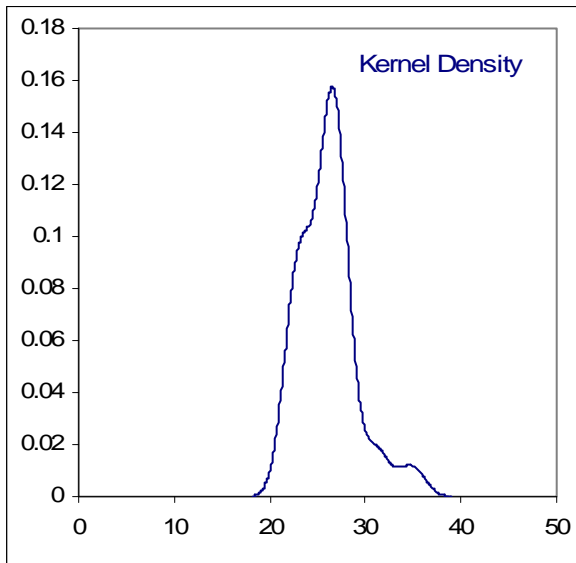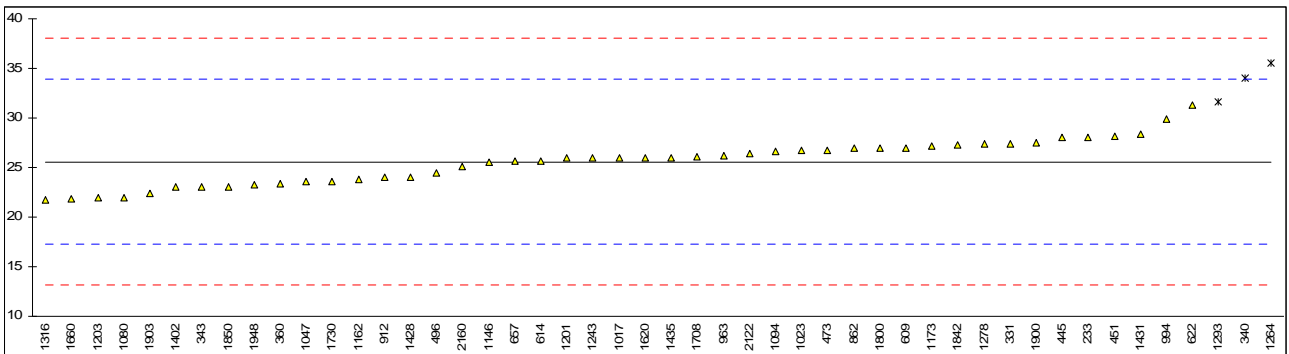
Determination of Chromium (Cr) on sample #1043; results in mg/kg

lab	method	value	mark	z(targ)	remarks
233	in house	26.49		0.86	
237		-----		-----	
252		-----		-----	
254		-----		-----	
255		-----		-----	
318	D5185	28		1.59	
331	D5185	24.80		0.03	
340	D5185	32	G(0.05)	3.55	
343	D5185	25		0.13	
353		-----		-----	
360	D5185	23.6		-0.56	
432		-----		-----	
445	D5185	27		1.11	
450		-----		-----	
451	D5185	24.3		-0.21	
473	D5185Mod	26.0454		0.64	
496	D5185	23.2		-0.75	
593		-----		-----	
609	D5185	29		2.08	
614	D5185	26.1		0.67	
622	D5185	23.04		-0.83	
657	D5185	24.7		-0.02	
663		-----		-----	
840		-----		-----	
850		-----		-----	
862	D5185	26.3		0.76	
875		-----		-----	
912	D5185	26		0.62	
963	D5185	23.4		-0.65	
994	D5185	19.80		-2.41	
1013		-----		-----	
1017	D5185	25.1		0.18	
1023	D5185	25.9		0.57	
1047	D5185	23		-0.85	
1059	in house	25		0.13	
1080	D5185	21		-1.82	
1094	D5185	24.8		0.03	
1106		-----		-----	
1146	D5185	24.35		-0.19	
1155	DIN51397-2	41.045	C,G(0.01)	7.96	First reported 51.345
1162	D6595	34.8	G(0.05)	4.91	
1173	in house	26.3		0.76	
1201	D5185	24		-0.36	
1203	D5185	20		-2.31	
1231		-----		-----	
1234	in house	37	C,G(0.05)	5.99	First reported 18
1243	D5185	25.8		0.52	
1264	D6595	38.59	G(0.05)	6.77	
1278	D5185	25.4		0.32	
1287	D6595	25.8	C	0.52	First reported 35.8
1293	D6595	29.850		2.50	
1316	D5185	24.8		0.03	
1402	D5185	22		-1.34	
1406	D4628	24.8		0.03	
1428	D5185	23		-0.85	
1431	in house	31.0		3.06	
1435	D5185	24		-0.36	
1526	D5185	27		1.11	
1535		-----		-----	
1540		-----		-----	
1543		-----		-----	
1613		-----		-----	
1620	D5185	25		0.13	
1648	D5185	23.51		-0.60	
1650		-----		-----	
1652		-----		-----	
1660	D5185	20.20		-2.22	
1708	D5185	26.0		0.62	
1720		-----		-----	
1722		-----		-----	
1730	D5185	22.311		-1.18	
1800	in house	26.7		0.96	
1825		-----		-----	
1827		-----		-----	

1833		-----	-----
1842	in house	26.6	0.91
1850	in house	21	-1.82
1900	D6595	27.79395	1.49
1903	inh-74	25.89	0.56
1948	D5185	22.42	-1.13
2122	D5185	25.45	0.35
2133	D5185	20.570	-2.03
2160	D6052	28.62	1.90
4091		-----	-----
7003	D3919	19.3	-2.65

normality	OK
n	53
outliers	5
mean (n)	24.74
st.dev. (n)	2.540
R(calc.)	7.11
R(D5185:09)	5.73
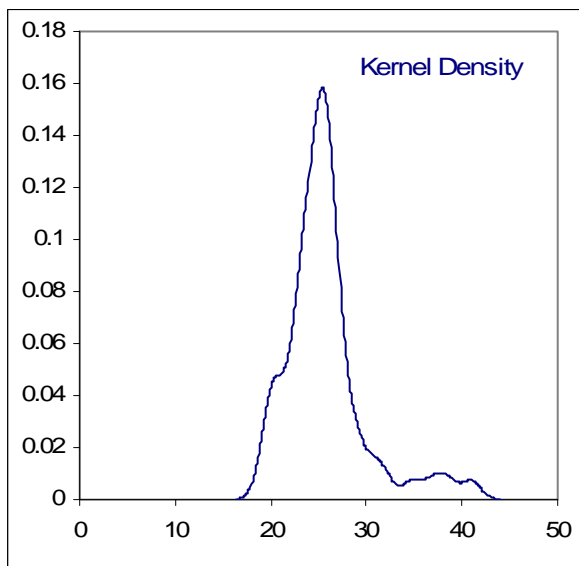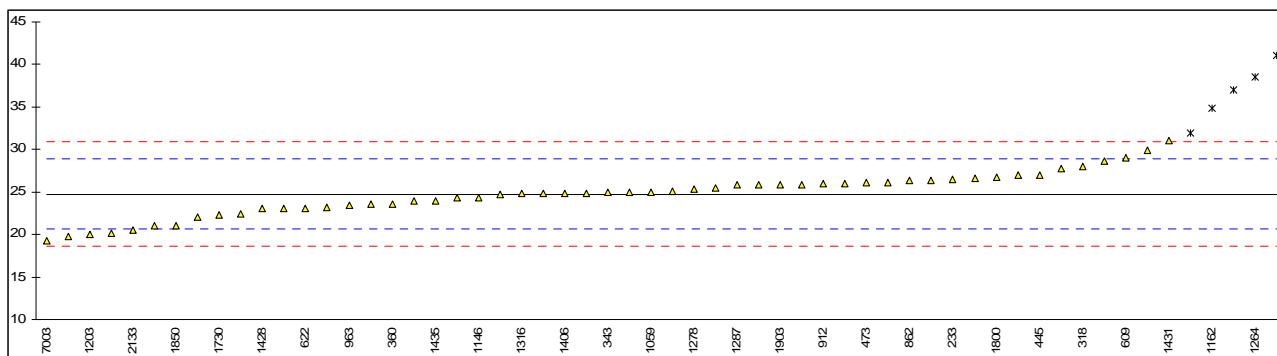
Determination of Copper (Cu) on sample #1043; results in mg/kg

lab	method	value	mark	z(targ)	remarks
233	in house	36.72		0.09	
237		-----		-----	
252		-----		-----	
254		-----		-----	
255		-----		-----	
318	D5185	40		1.14	
331	D5185	35.33		-0.35	
340	D5185	45		2.75	
343	D5185	35		-0.46	
353		-----		-----	
360	D5185	34.4		-0.65	
432		-----		-----	
445	D5185	37		0.18	
450		-----		-----	
451	D5185	40.7		1.37	
473	D5185Mod	37.5798		0.37	
496	D5185	36.0		-0.14	
593		-----		-----	
609	D5185	33		-1.10	
614	D5185	36.8		0.12	
622	D5185	38.11		0.54	
657	D5185	37.5		0.34	
663		-----		-----	
840		-----		-----	
850		-----		-----	
862	D5185	38.1		0.54	
875		-----		-----	
912	D5185	36		-0.14	
963	D5185	38.43		0.64	
994	D5185	35.29		-0.36	
1013		-----		-----	
1017	D5185	35.7		-0.23	
1023	D5185	38.9		0.79	
1047	D5185	33		-1.10	
1059	in house	33		-1.10	
1080	D5185	33		-1.10	
1094	D5185	35.7		-0.23	
1106		-----		-----	
1146	D5185	35.79		-0.20	
1155	DIN51397-2	33.023		-1.09	
1162	D6595	44.1		2.46	
1173	in house	38.5		0.66	
1201	D5185	36		-0.14	
1203	D5185	34		-0.78	
1231		-----		-----	
1234	in house	28	C	-2.70	First reported 22
1243	D5185	39.5		0.98	
1264	D6595	49.33	G(0.05)	4.13	
1278	D5185	39.3		0.92	
1287	D6595	45.3		2.84	
1293	D6595	41.353		1.58	
1316	D5185	35.8		-0.20	
1402	D5185	31		-1.74	
1406	D4628	35.6		-0.27	
1428	D5185	34		-0.78	
1431	in house	40.5		1.30	
1435	D5185	36		-0.14	
1526	D5185	35		-0.46	
1535		-----		-----	
1540		-----		-----	
1543		-----		-----	
1613		-----		-----	
1620	D5185	37		0.18	
1648	D5185	34.95		-0.47	
1650		-----		-----	
1652		-----		-----	
1660	D5185	29.75		-2.14	
1708	D5185	38.1		0.54	
1720		-----		-----	
1722		-----		-----	
1730	D5185	32.410		-1.29	
1800	in house	38.4		0.63	
1825		-----		-----	
1827		-----		-----	

1833		-----	-----
1842	in house	37.6	0.38
1850	in house	29	-2.38
1900	D6595	41.55202	1.64
1903	inh-74	40.05	1.16
1948	D5185	33.32	-1.00
2122	D5185	36.5	0.02
2133	D5185	31.494	-1.58
2160	in house	38.33	0.61
4091		-----	-----
7003	D4691	34.94	-0.48

normality	OK
n	57
outliers	1
mean (n)	36.43
st.dev. (n)	3.571
R(calc.)	10.00
R(D5185:09)	8.74
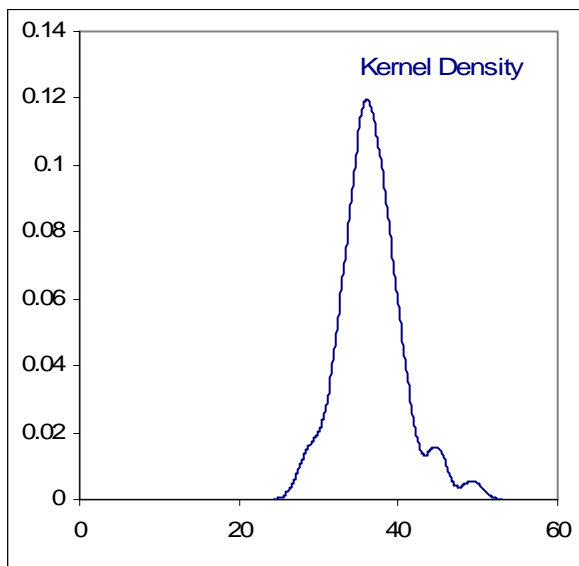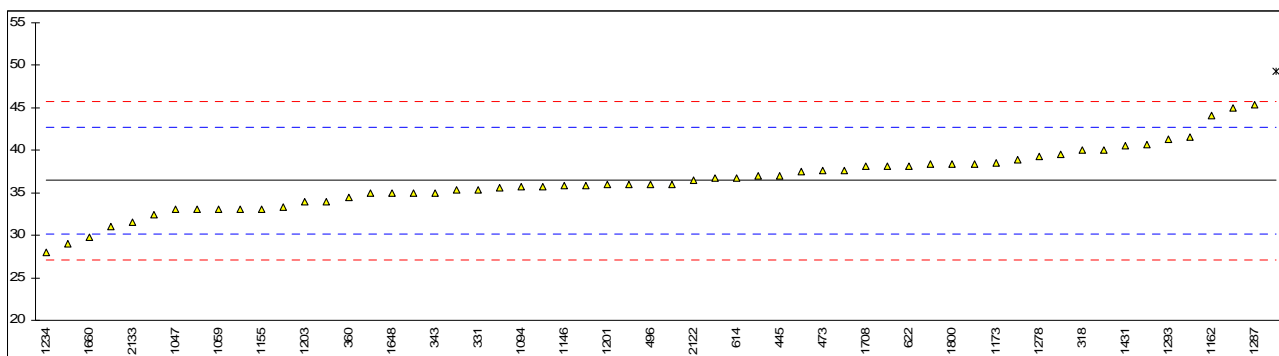
Determination of Iron (Fe) on sample #1043; results in mg/kg

lab	method	value	mark	z(targ)	remarks
233	in house	29.46		-0.16	
237		-----		-----	
252		-----		-----	
254		-----		-----	
255		-----		-----	
318		-----		-----	
331	D5185	28.66		-0.44	
340	D5185	34		1.46	
343	D5185	30		0.03	
353		-----		-----	
360	D5185	28.1		-0.64	
432		-----		-----	
445	D5185	33		1.10	
450		-----		-----	
451	D5185	24.5		-1.92	
473	D5185Mod	32.7705		1.02	
496	D5185	27.9		-0.71	
593		-----		-----	
609	D5185	35		1.81	
614	D5185	32.2		0.82	
622	D5185	25.63		-1.52	
657	D5185	24.5		-1.92	
663		-----		-----	
840		-----		-----	
850		-----		-----	
862	D5185	31.6		0.60	
875		-----		-----	
912	D5185	30		0.03	
963	D5185	31.12		0.43	
994	D5185	30.02		0.04	
1013		-----		-----	
1017	D5185	30.2		0.11	
1023	D5185	31.9		0.71	
1047	D5185	29		-0.32	
1059	in house	28		-0.68	
1080	D5185	25		-1.74	
1094	D5185	30.5		0.21	
1106		-----		-----	
1146	D5185	29.41		-0.17	
1155	DIN51397-2	28.795		-0.39	
1162	D6595	42.2	G(0.05)	4.37	
1173	in house	33.0		1.10	
1201	D5185	30		0.03	
1203	D5185	25		-1.74	
1231		-----		-----	
1234	in house	35	C	1.81	First reported 17
1243	D5185	30.7		0.28	
1264	D6595	37.72	DG(0.05)	2.78	
1278	D5185	32.5		0.92	
1287	D6595	34.5		1.63	
1293	D6595	27.599		-0.82	
1316	D5185	28.0		-0.68	
1402	D5185	28		-0.68	
1406	D4628	31.6		0.60	
1428	D5185	28		-0.68	
1431	in house	30.5		0.21	
1435	D5185	30		0.03	
1526		-----		-----	
1535		-----		-----	
1540	in house	35		1.81	
1543		-----		-----	
1613		-----		-----	
1620	D5185	30		0.03	
1648	D5185	34.48		1.63	
1650		-----		-----	
1652		-----		-----	
1660	D5185	23.80		-2.17	
1708	D5185	32.7		0.99	
1720		-----		-----	
1722		-----		-----	
1730	D5185	27.231		-0.95	
1800	in house	32.6		0.96	
1825		-----		-----	
1827		-----		-----	

1833		-----		-----
1842	in house	31.2		0.46
1850	in house	28		-0.68
1900	D6595	29.392889		-0.18
1903	inh-74	29.61		-0.10
1948	D5185	28.12		-0.63
2122	D5185	32.0		0.75
2133	D5185	25.412		-1.60
2160	in house	37.73	DG(0.05)	2.78
4091		-----		-----
7003	D4691	29.49		-0.15

	Normality	OK
	N	54
	Outliers	3
	mean (n)	29.90
	st.dev. (n)	2.874
	R(calc.)	8.05
	R(D5185:09)	7.88
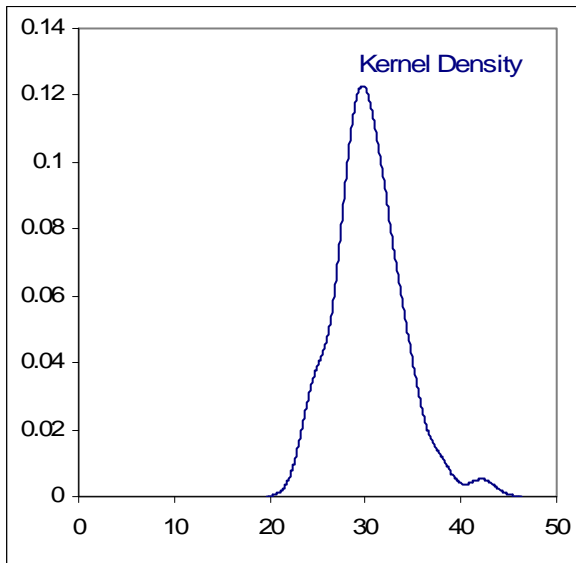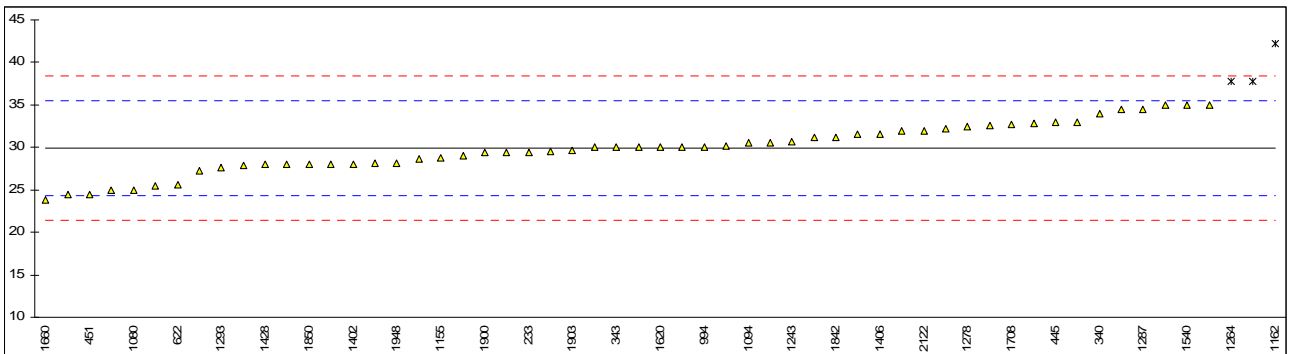
Determination of Lead (Pb) on sample #1043; results in mg/kg

lab	method	value	mark	z(targ)	remarks
233	in house	37.67		1.93	
237		-----		-----	
252		-----		-----	
254		-----		-----	
255		-----		-----	
318	D5185	32		0.39	
331	D5185	30.66		0.02	
340	D5185	36		1.48	
343	D5185	28		-0.70	
353		-----		-----	
360	D5185	29.4		-0.32	
432		-----		-----	
445	D5185	32		0.39	
450		-----		-----	
451	D5185	56.4	G(0.01)	7.04	
473	D5185Mod	31.6621		0.30	
496	D5185	29.0		-0.43	
593		-----		-----	
609	D5185	17	G(0.05)	-3.70	
614	D5185	32.1		0.42	
622	D5185	28.10		-0.67	
657	D5185	31.2		0.17	
663		-----		-----	
840		-----		-----	
850		-----		-----	
862	D5185	31.3		0.20	
875		-----		-----	
912	D5185	31		0.12	
963	D5185	33.2		0.72	
994	D5185	33.57		0.82	
1013		-----		-----	
1017	D5185	31.0		0.12	
1023	D5185	30.2		-0.10	
1047	D5185	30		-0.16	
1059	in house	34		0.93	
1080	D5185	31		0.12	
1094	D5185	30.5		-0.02	
1106		-----		-----	
1146	D5185	29.21		-0.37	
1155	DIN51397-2	28.731		-0.50	
1162	D6595	41.2	G(0.05)	2.90	
1173	in house	32.1		0.42	
1201	D5185	29		-0.43	
1203	D5185	25		-1.52	
1231		-----		-----	
1234	in house	25		-1.52	
1243	D5185	30.2		-0.10	
1264	D6595	40.07	DG(0.05)	2.59	
1278	D5185	31.9		0.36	
1287	D6595	40.6	DG(0.05)	2.73	
1293	D6595	30.931		0.10	
1316	D5185	22.2		-2.28	
1402	D5185	30		-0.16	
1406	D4628	30.3		-0.07	
1428	D5185	28		-0.70	
1431	in house	32.0		0.39	
1435	D5185	31		0.12	
1526	D5185	29		-0.43	
1535		-----		-----	
1540		-----		-----	
1543		-----		-----	
1613		-----		-----	
1620	D5185	30		-0.16	
1648	D5185	28.07		-0.68	
1650		-----		-----	
1652		-----		-----	
1660	D5185	24.56		-1.64	
1708	D5185	30.7		0.03	
1720		-----		-----	
1722		-----		-----	
1730	D5185	28.425		-0.59	
1800	in house	33.0		0.66	
1825		-----		-----	
1827		-----		-----	

1833		-----	-----
1842	in house	31.5	0.25
1850	in house	30	-0.16
1900	D6595	36.54932	1.63
1903	inh-74	29.51	-0.29
1948	D5185	27.42	-0.86
2122	D5185	30.6	0.01
2133	D5185	30.464	-0.03
2160	D6052	32.84	0.62
4091		-----	-----
7003	D3919	38.6	2.19

normality	not OK
n	53
outliers	5
mean (n)	30.57
st.dev. (n)	2.976
R(calc.)	8.33
R(D5185:09)	10.28
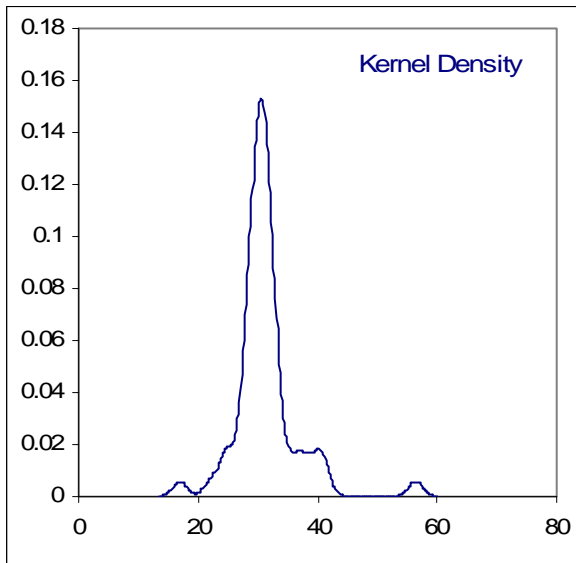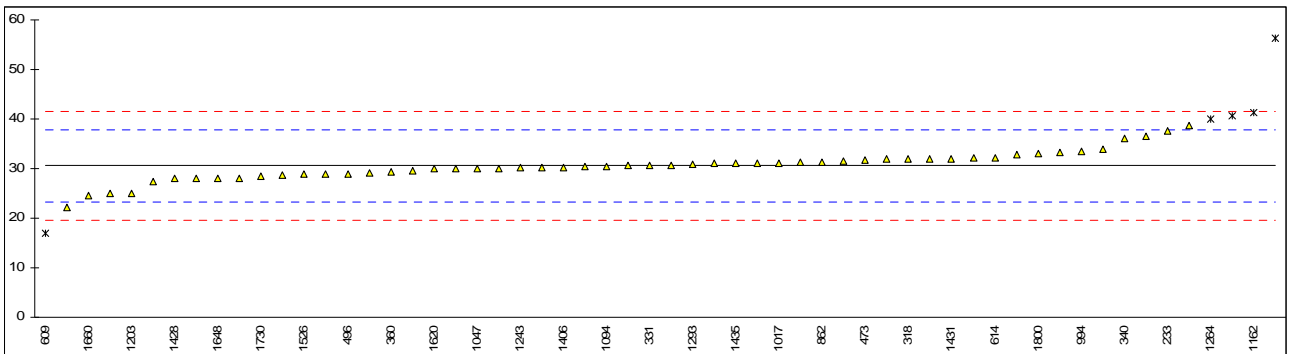
Determination of Lithium (Li) on sample #1043; results in mg/kg

lab	method	value	mark	z(targ)	remarks
233	in house	49.03	G(0.01)	8.40	
237		-----		-----	
252		-----		-----	
254		-----		-----	
255		-----		-----	
318		-----		-----	
331		-----		-----	
340		27		0.02	
343	inh-1180	25		-0.74	
353		-----		-----	
360		-----		-----	
432		-----		-----	
445		-----		-----	
450		-----		-----	
451	D5185	21.0		-2.27	
473		-----		-----	
496	D5185	27.0		0.02	
593		-----		-----	
609		-----		-----	
614		-----		-----	
622		-----		-----	
657		-----		-----	
663		-----		-----	
840		-----		-----	
850		-----		-----	
862	INH-024	28.8		0.70	
875		-----		-----	
912		-----		-----	
963		-----		-----	
994		-----		-----	
1013		-----		-----	
1017		-----		-----	
1023		-----		-----	
1047	in house	26		-0.36	
1059		-----		-----	
1080		-----		-----	
1094		-----		-----	
1106		-----		-----	
1146		28.29		0.51	
1155		-----		-----	
1162		-----		-----	
1173		-----		-----	
1201		-----		-----	
1203	D5185	25		-0.74	
1231		-----		-----	
1234		-----		-----	
1243		-----		-----	
1264		-----		-----	
1278		-----		-----	
1287		-----		-----	
1293		-----		-----	
1316		-----		-----	
1402		-----		-----	
1406		-----		-----	
1428		-----		-----	
1431	in house	31.4		1.69	
1435		30		1.16	
1526		-----		-----	
1535		-----		-----	
1540		-----		-----	
1543		-----		-----	
1613		-----		-----	
1620	D5185	27		0.02	
1648		-----		-----	
1650		-----		-----	
1652		-----		-----	
1660		-----		-----	
1708		-----		-----	
1720		-----		-----	
1722		-----		-----	
1730		-----		-----	
1800		-----		-----	
1825		-----		-----	
1827		-----		-----	

1833	-----	-----
1842	-----	-----
1850	-----	-----
1900	-----	-----
1903	-----	-----
1948	-----	-----
2122	-----	-----
2133	-----	-----
2160	-----	-----
4091	-----	-----
7003	-----	-----

normality	OK
n	11
outliers	1
mean (n)	26.95
st.dev. (n)	2.797
R(calc.)	7.83
R(Horwitz)	7.35

Kernel Density
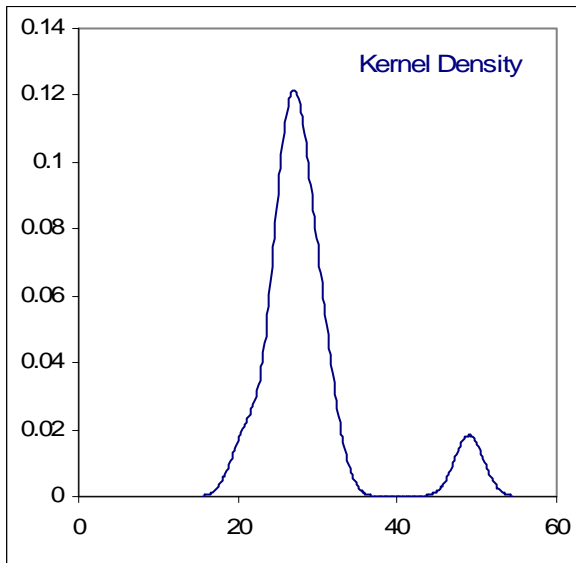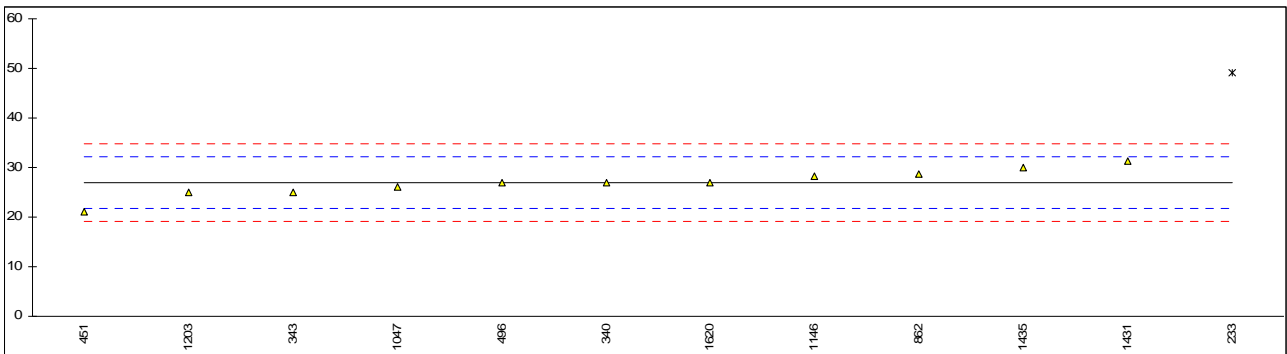
Determination of Magnesium (Mg) on sample #1043; results in mg/kg

lab	method	value	mark	z(targ)	remarks
233	in house	81.43		0.22	
237		-----		-----	
252		-----		-----	
254		-----		-----	
255		-----		-----	
318		-----		-----	
331	D5185	75.44		-0.58	
340	D5185	103	DG(0.05)	3.10	
343	D5185	82		0.30	
353		-----		-----	
360	D5185	75.5		-0.57	
432		-----		-----	
445	D5185	84		0.56	
450		-----		-----	
451	D5185	24.8	G(0.01)	-7.34	
473	D5185Mod	83.0076		0.43	
496	D5185	74.94		-0.65	
593		-----		-----	
609	D5185	87		0.96	
614	D5185	80.1		0.04	
622	D5185	80.58		0.11	
657	D5185	79.5		-0.04	
663		-----		-----	
840		-----		-----	
850		-----		-----	
862	D5185	90.0		1.36	
875		-----		-----	
912	D5185	80		0.03	
963	D5185	78.07		-0.23	
994	D5185	81.79		0.27	
1013		-----		-----	
1017	D5185	81.2		0.19	
1023	D5185	81.9		0.28	
1047	D5185	74		-0.77	
1059	in house	78		-0.24	
1080	D5185	70		-1.31	
1094	D5185	79.6		-0.02	
1106		-----		-----	
1146	D5185	78.43		-0.18	
1155	DIN51397-2	80.077		0.04	
1162	D6595	110.2	G(0.05)	4.06	
1173	in house	80.2		0.06	
1201	D5185	75		-0.64	
1203	D5185	66		-1.84	
1231		-----		-----	
1234	D6443	101	C,DG(0.05)	2.83	First reported 136
1243	D5185	82.8		0.40	
1264	D6595	97.04		2.30	
1278	D5185	83.0		0.43	
1287		-----		-----	
1293	D6595	88.066		1.11	
1316	D5185	69.5		-1.37	
1402	D5185	70		-1.31	
1406	D4628	83.1		0.44	
1428	D5185	74		-0.77	
1431	in house	85.6		0.78	
1435	D5185	79		-0.10	
1526		-----		-----	
1535		-----		-----	
1540		-----		-----	
1543		-----		-----	
1613		-----		-----	
1620	D5185	80		0.03	
1648	D5185	77.18		-0.35	
1650		-----		-----	
1652		-----		-----	
1660	D5185	62.0		-2.37	
1708	D5185	84.5		0.63	
1720		-----		-----	
1722		-----		-----	
1730	D5185	74.637		-0.69	
1800	in house	82.8		0.40	
1825		-----		-----	
1827		-----		-----	

1833		-----		-----
1842	in house	84.3		0.60
1850		-----		-----
1900	D6595	86.37951		0.88
1903	inh-74	80.50		0.10
1948	D5185	77.89		-0.25
2122	D5185	79.2		-0.08
2133	D5185	42.256	G(0.01)	-5.01
2160	D5185	87.20		0.99
4091		-----		-----
7003	D4691	82.87		0.41

normality	OK
n	49
outliers	5
mean (n)	79.78
st.dev. (n)	6.114
R(calc.)	17.12
R(D5185:09)	20.98
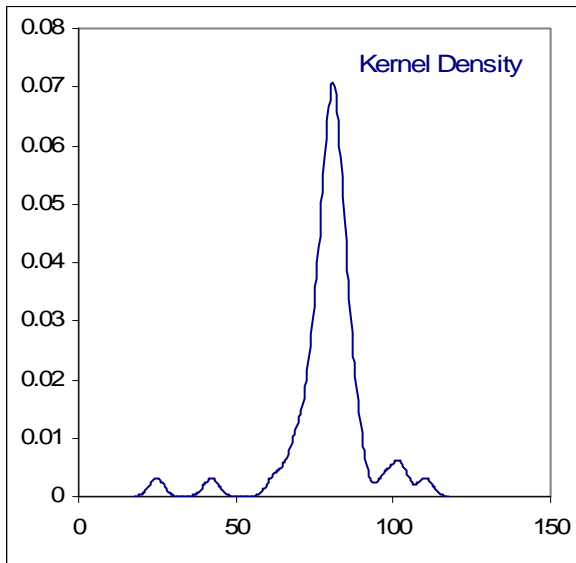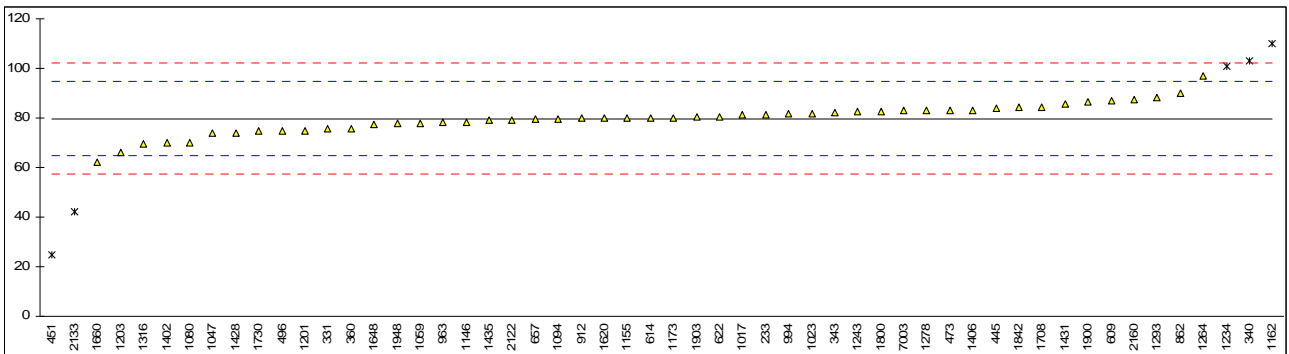
Determination of Manganese (Mn) on sample #1043; results in mg/kg

lab	method	value	mark	z(targ)	remarks
233	in house	29.56		1.87	
237		-----		-----	
252		-----		-----	
254		-----		-----	
255		-----		-----	
318	D5185	29		1.62	
331	D5185	24.80		-0.25	
340	D5185	30		2.06	
343	D5185	25		-0.16	
353		-----		-----	
360	D5185	24.0		-0.60	
432		-----		-----	
445	D5185	27		0.73	
450		-----		-----	
451	D5185	24.8		-0.25	
473	D5185Mod	25.9728		0.27	
496	D5185	24.5		-0.38	
593		-----		-----	
609	D5185	27		0.73	
614	D5185	27		0.73	
622		-----		-----	
657	D5185	24.6		-0.34	
663		-----		-----	
840		-----		-----	
850		-----		-----	
862	D5185	28.3		1.31	
875		-----		-----	
912	D5185	27		0.73	
963	D5185	26.19		0.37	
994	D5185	22.40		-1.32	
1013		-----		-----	
1017	D5185	25.0		-0.16	
1023	D5185	26.2		0.37	
1047	D5185	23		-1.05	
1059	in house	23		-1.05	
1080	D5185	21		-1.94	
1094	D5185	24.3		-0.47	
1106		-----		-----	
1146	D5185	24.80		-0.25	
1155		-----		-----	
1162		-----		-----	
1173	in house	26.9		0.69	
1201	D5185	24		-0.60	
1203	D5185	23		-1.05	
1231		-----		-----	
1234	in house	21	C	-1.94	First reported 17
1243	D5185	28.5		1.40	
1264		-----		-----	
1278	D5185	26.6		0.55	
1287		-----		-----	
1293	D6595	31.900		2.91	
1316	D5185	20.9		-1.98	
1402	D5185	23		-1.05	
1406	D4628	24.8		-0.25	
1428	D5185	23		-1.05	
1431	in house	31.2		2.60	
1435	D5185	25		-0.16	
1526		-----		-----	
1535		-----		-----	
1540		-----		-----	
1543		-----		-----	
1613		-----		-----	
1620	D5185	25		-0.16	
1648		-----		-----	
1650		-----		-----	
1652		-----		-----	
1660	D5185	20.48		-2.17	
1708	D5185	26.8		0.64	
1720		-----		-----	
1722		-----		-----	
1730	D5185	22.391		-1.32	
1800	in house	27.7		1.04	
1825		-----		-----	
1827		-----		-----	

1833		-----		-----
1842	in house	27.0		0.73
1850	in house	22		-1.49
1900		-----		-----
1903	inh-74	26.83		0.65
1948	D5185	22.43		-1.30
2122	D5185	25.45		0.04
2133		-----		-----
2160	in house	26.93		0.70
4091		-----		-----
7003		-----		-----

normality	OK
n	48
outliers	0
mean (n)	25.36
st.dev. (n)	2.666
R(calc.)	7.46
R(D5185:09)	6.29
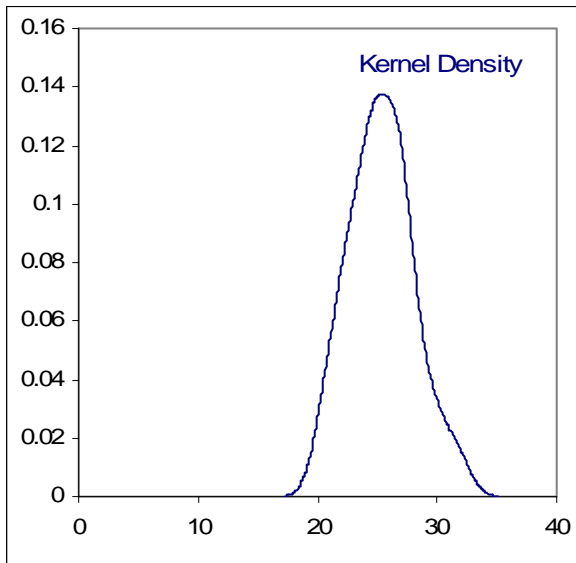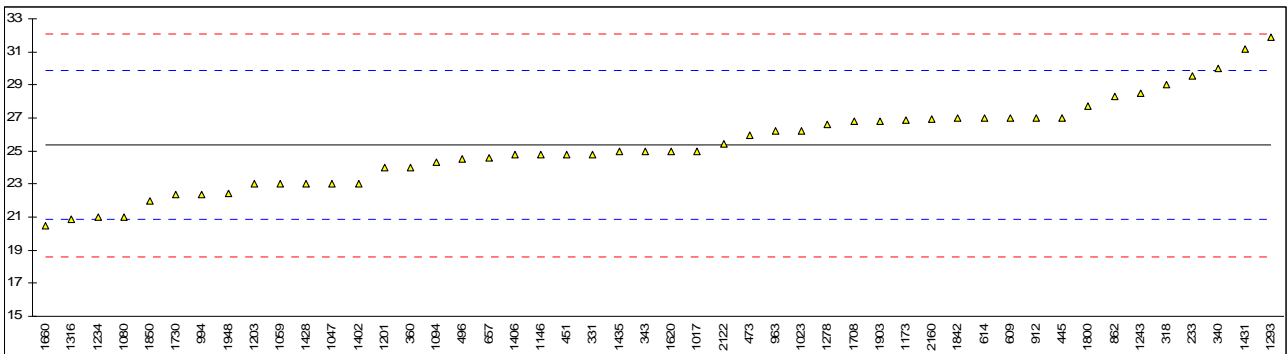
Determination of Molybdenum (Mo) on sample #1043; results in mg/kg

lab	method	value	mark	z(targ)	remarks
233	in house	22.23		-0.87	
237		-----		-----	
252		-----		-----	
254		-----		-----	
255		-----		-----	
318		-----		-----	
331	D5185	25.00		0.39	
340	D5185	30	G(0.05)	2.67	
343	D5185	23		-0.52	
353		-----		-----	
360	D5185	23.1		-0.47	
432		-----		-----	
445	D5185	27		1.30	
450		-----		-----	
451	D5185	26.1		0.89	
473	D5185Mod	25.6545		0.69	
496	D5185	23.4		-0.34	
593		-----		-----	
609	D5185	24		-0.06	
614	D5185	25.6		0.67	
622		-----		-----	
657	D5185	24.1		-0.02	
663		-----		-----	
840		-----		-----	
850		-----		-----	
862	D5185	25.6		0.67	
875		-----		-----	
912	D5185	27		1.30	
963	D5185	23.47		-0.31	
994	D5185	22.62		-0.69	
1013		-----		-----	
1017	D5185	24.9		0.35	
1023	D5185	26.0		0.85	
1047	D5185	24		-0.06	
1059	in house	27		1.30	
1080	D5185	19		-2.35	
1094	D5185	24.6		0.21	
1106		-----		-----	
1146		-----		-----	
1155		-----		-----	
1162		-----		-----	
1173	in house	25.9		0.80	
1201	D5185	25		0.39	
1203	D5185	21		-1.43	
1231		-----		-----	
1234	in house	19	C	-2.35	First reported 11
1243	D5185	27.5		1.53	
1264	D6595	23.51		-0.29	
1278	D5185	26.0		0.85	
1287		-----		-----	
1293	D6595	19.759		-2.00	
1316	D5185	24.1		-0.02	
1402	D5185	22		-0.98	
1406		-----		-----	
1428	D5185	23		-0.52	
1431	in house	27.9		1.72	
1435	D5185	25		0.39	
1526		-----		-----	
1535		-----		-----	
1540		-----		-----	
1543		-----		-----	
1613		-----		-----	
1620	D5185	24		-0.06	
1648		-----		-----	
1650		-----		-----	
1652		-----		-----	
1660	D5185	20.39		-1.71	
1708	D5185	26.4		1.03	
1720		-----		-----	
1722		-----		-----	
1730	D5185	22.832		-0.60	
1800	in house	26.5		1.08	
1825		-----		-----	
1827		-----		-----	

1833		-----	-----
1842	in house	26.8	1.21
1850	in house	24	-0.06
1900	D6595	24.27158	0.06
1903	inh-74	21.10	-1.39
1948		-----	-----
2122	D5185	25.85	0.78
2133	D5185	20.955	-1.45
2160	in house	24.30	0.07
4091		-----	-----
7003		-----	-----

normality	OK
n	46
outliers	1
mean (n)	24.14
st.dev. (n)	2.246
R(calc.)	6.29
R(D5185:09)	6.14
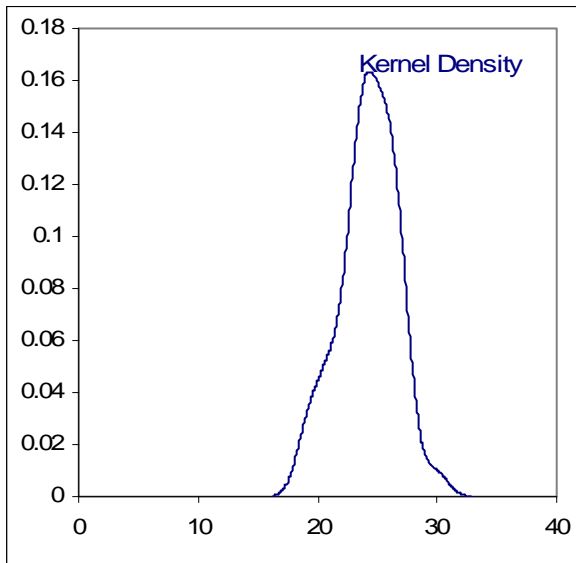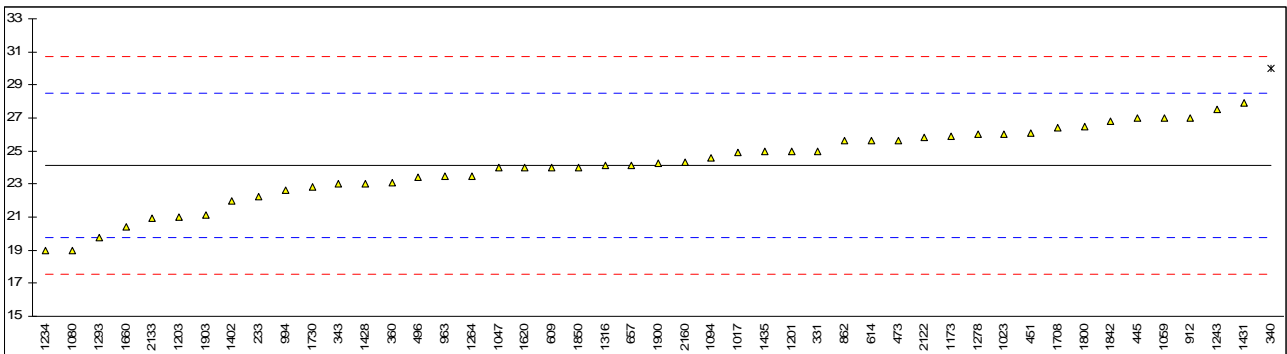
Determination of Nickel (Ni) on sample #1043; results in mg/kg

lab	method	value	mark	z(targ)	remarks
233	in house	29.82		1.99	
237		-----		-----	
252		-----		-----	
254		-----		-----	
255		-----		-----	
318	D5185	26		0.55	
331	D5185	24.00		-0.21	
340	D5185	29		1.68	
343	D5185	23		-0.58	
353		-----		-----	
360	D5185	23.5		-0.40	
432		-----		-----	
445	D5185	26		0.55	
450		-----		-----	
451	D5185	22.0		-0.96	
473	D5185Mod	24.4666		-0.03	
496	D5185	23.8		-0.28	
593		-----		-----	
609	D5185	32		2.81	
614	D5185	25.6		0.40	
622	D5185	21.34		-1.21	
657	D5185	24.5		-0.02	
663		-----		-----	
840		-----		-----	
850		-----		-----	
862	D5185	26.4		0.70	
875		-----		-----	
912		-----		-----	
963	D5185	25.24		0.26	
994		-----		-----	
1013		-----		-----	
1017	D5185	24.2		-0.13	
1023	D5185	24.6		0.02	
1047	D5185	23		-0.58	
1059	in house	21		-1.34	
1080	D5185	23		-0.58	
1094	D5185	23.1		-0.55	
1106		-----		-----	
1146	D5185	24.60		0.02	
1155	DIN51397-2	23.737		-0.31	
1162	D6595	32.9		3.15	
1173	in house	25.5		0.36	
1201	D5185	25		0.17	
1203	D5185	21		-1.34	
1231		-----		-----	
1234	in house	19	C	-2.09	First reported 13
1243	D5185	24.6		0.02	
1264	D6595	35.49	G(0.05)	4.12	
1278	D5185	24.9		0.13	
1287	D6595	25.2	C	0.25	First reported 35.2
1293	D6595	30.222		2.14	
1316	D5185	24.7		0.06	
1402	D5185	22		-0.96	
1406	D4628	22.6		-0.73	
1428	D5185	22		-0.96	
1431	in house	26.8		0.85	
1435	D5185	25		0.17	
1526	D5185	23		-0.58	
1535		-----		-----	
1540		-----		-----	
1543		-----		-----	
1613		-----		-----	
1620	D5185	25		0.17	
1648	D5185	18.01		-2.46	
1650		-----		-----	
1652		-----		-----	
1660	D5185	19.47		-1.91	
1708	D5185	25.2		0.25	
1720		-----		-----	
1722		-----		-----	
1730	D5185	22.309		-0.84	
1800	in house	26.1		0.58	
1825		-----		-----	
1827		-----		-----	

1833		-----	-----
1842	in house	25.7	0.43
1850	in house	21	-1.34
1900	D6595	30.96352	2.42
1903	inh-74	25.51	0.36
1948	D5185	22.02	-0.95
2122	D5185	24.95	0.15
2133	D5185	21.975	-0.97
2160	in house	29.07	1.70
4091		-----	-----
7003	D4691	24.6	0.02

normality	not OK
n	55
outliers	1
mean (n)	24.55
st.dev. (n)	3.017
R(calc.)	8.45
R(D5185:09)	7.43
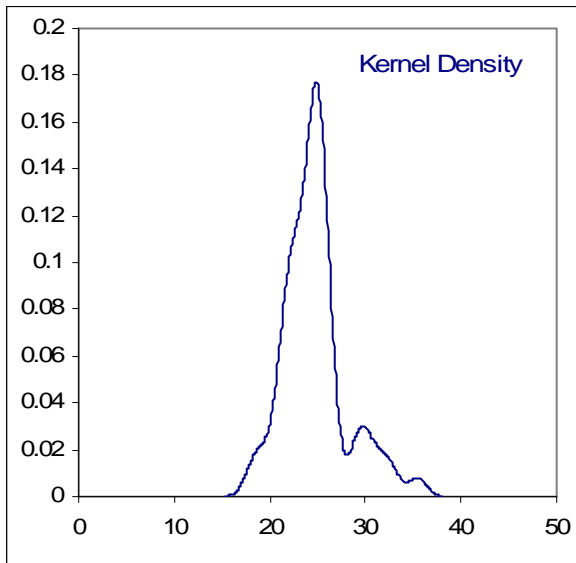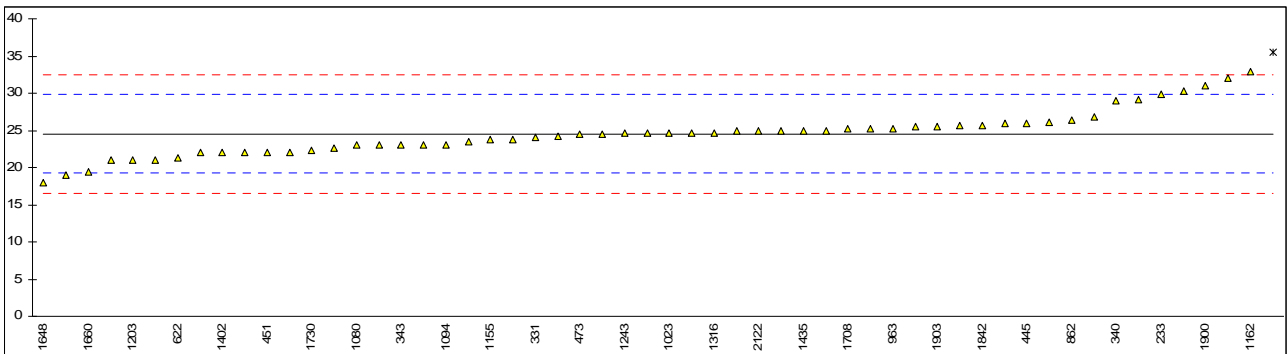
Determination of Sodium (Na) on sample #1043; results in mg/kg

lab	method	value	mark	z(targ)	remarks
233	in house	44.44		3.83	
237		-----		-----	
252		-----		-----	
254		-----		-----	
255		-----		-----	
318		-----		-----	
331	D5185	25.80		-0.59	
340	D5185	32		0.88	
343	D5185	21		-1.73	
353		-----		-----	
360	D5185	22.2		-1.44	
432		-----		-----	
445	D5185	30		0.41	
450		-----		-----	
451	D5185	24.4		-0.92	
473	D5185Mod	28.9246		0.15	
496	D5185	28.1		-0.04	
593		-----		-----	
609	D5185	35		1.59	
614	D5185	27.6		-0.16	
622		-----		-----	
657	D5185	29.5		0.29	
663		-----		-----	
840		-----		-----	
850		-----		-----	
862	D5185	30.3		0.48	
875		-----		-----	
912		-----		-----	
963		-----		-----	
994		-----		-----	
1013		-----		-----	
1017		-----		-----	
1023	D5185	30.8		0.60	
1047	D5185	26		-0.54	
1059		-----		-----	
1080	D5185	25		-0.78	
1094	D5185	28.0		-0.07	
1106		-----		-----	
1146	D5185	27.00		-0.30	
1155		-----		-----	
1162	D6595	45.8	DG(0.05)	4.16	
1173	in house	21.3		-1.66	
1201	D5185	40		2.78	
1203	D5185	20		-1.96	
1231		-----		-----	
1234		-----		-----	
1243		-----		-----	
1264	D6595	60.42	G(0.05)	7.62	
1278	D5185	29.5		0.29	
1287		-----		-----	
1293	D6595	82.000	G(0.01)	12.74	
1316	D5185	20.7		-1.80	
1402	D5185	23		-1.25	
1406		-----		-----	
1428	D5185	31		0.64	
1431	in house	35.3		1.66	
1435	D5185	28		-0.07	
1526		-----		-----	
1535		-----		-----	
1540		-----		-----	
1543		-----		-----	
1613		-----		-----	
1620	D5185	26		-0.54	
1648	D5185	29.03		0.18	
1650		-----		-----	
1652		-----		-----	
1660	D5185	24.0		-1.02	
1708	D5185	27.6	C	-0.16	First reported 51.3
1720		-----		-----	
1722		-----		-----	
1730	D5185	27.068		-0.29	
1800	in house	31.9		0.86	
1825		-----		-----	
1827		-----		-----	

1833		-----		-----	
1842	in house	30.4		0.50	
1850		-----		-----	
1900	D6595	48.1	DG(0.05)	4.70	
1903	inh-74	32.63		1.03	
1948	D5185	22.14		-1.46	
2122	D5185	32.3		0.95	
2133	D5185	17.988		-2.44	
2160	D5185	37.1	C	2.09	First reported 41.6
4091		-----		-----	
7003	D4691	54.58	G(0.05)	6.24	

normality	OK
n	39
outliers	5
mean (n)	28.28
st.dev. (n)	5.532
R(calc.)	15.49
R(D5185:09)	11.80

Kernel Density
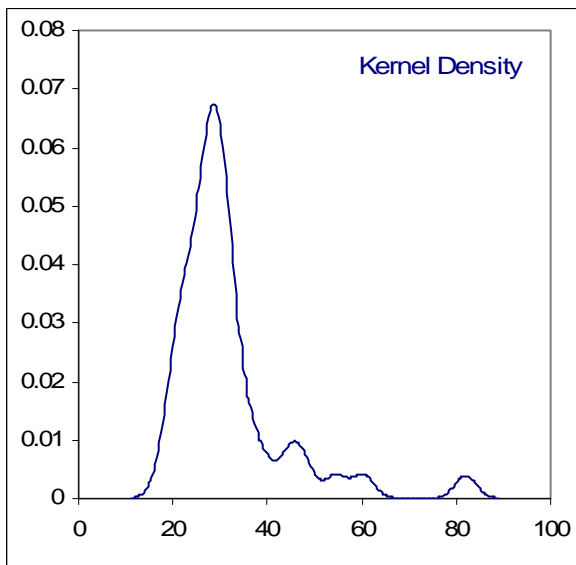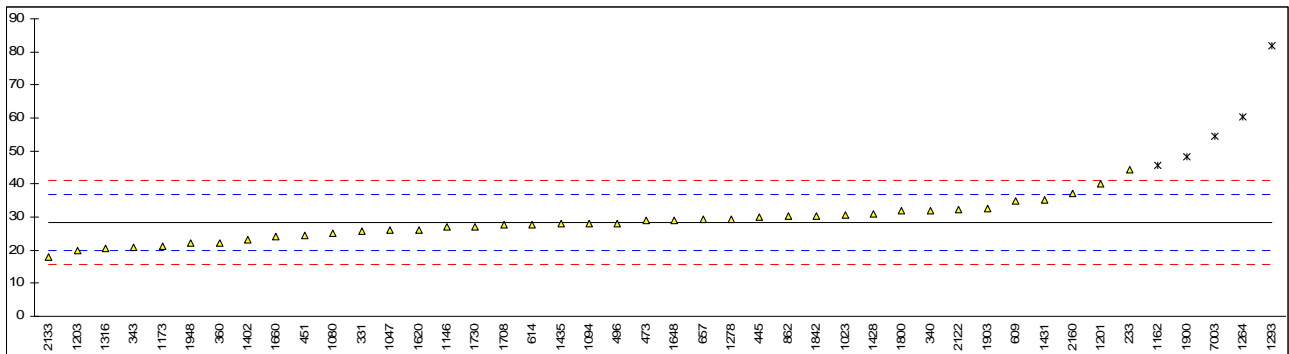
Determination of Silicon (Si) on sample #1043; results in mg/kg

lab	method	value	mark	z(targ)	remarks
233	in house	29.17		-0.01	
237		-----		-----	
252		-----		-----	
254		-----		-----	
255		-----		-----	
318		-----		-----	
331	D5185	26.66		-0.66	
340	D5185	33		0.98	
343	D5185	26		-0.84	
353		-----		-----	
360	D5185	26.7		-0.65	
432		-----		-----	
445	D5185	31		0.46	
450		-----		-----	
451	D5185	30.2		0.25	
473	D5185Mod	29.2874		0.02	
496	D5185	29.3		0.02	
593		-----		-----	
609	D5185	66	G(0.01)	9.52	
614	D5185	28.2		-0.27	
622	D5185	25.06		-1.08	
657	D5185	28.6		-0.16	
663		-----		-----	
840		-----		-----	
850		-----		-----	
862	D5185	29.4		0.05	
875		-----		-----	
912	D5185	30		0.20	
963	D5185	14.66	G(0.05)	-3.77	
994	D5185	30.89		0.43	
1013		-----		-----	
1017	D5185	26.4		-0.73	
1023	D5185	31.0		0.46	
1047	D5185	27		-0.58	
1059	in house	34		1.24	
1080	D5185	34		1.24	
1094	D5185	26.8		-0.63	
1106		-----		-----	
1146	D5185	28.79		-0.11	
1155		-----		-----	
1162	D6595	34.3		1.31	
1173	in house	31.1		0.49	
1201	D5185	27		-0.58	
1203	D5185	24		-1.35	
1231		-----		-----	
1234	in house	36		1.75	
1243	D5185	29.0		-0.06	
1264	D6595	34.67		1.41	
1278	D5185	32.6		0.87	
1287	D6595	34.5		1.37	
1293	D6595	28.447		-0.20	
1316	D5185	20.1	G(0.05)	-2.36	
1402	D5185	26		-0.84	
1406		-----		-----	
1428	D5185	27		-0.58	
1431	in house	31.3		0.54	
1435	D5185	27		-0.58	
1526		-----		-----	
1535		-----		-----	
1540		-----		-----	
1543		-----		-----	
1613		-----		-----	
1620	D5185	28		-0.32	
1648	D5185	27.5		-0.45	
1650		-----		-----	
1652		-----		-----	
1660	D5185	24.0		-1.35	
1708	D5185	30.5		0.33	
1720		-----		-----	
1722		-----		-----	
1730	D5185	25.127		-1.06	
1800	in house	29.3		0.02	
1825		-----		-----	
1827		-----		-----	

1833		-----		-----
1842	in house	30.0		0.20
1850		-----		-----
1900	D6595	30.33884		0.29
1903	inh-74	18.56	G(0.05)	-2.76
1948	D5185	28.50		-0.19
2122	D5185	29.49		0.07
2133	D5185	26.499		-0.71
2160	D5185	40.7	G(0.05)	2.97
4091		-----		-----
7003		-----		-----

normality	OK
n	47
outliers	5
mean (n)	29.23
st.dev. (n)	2.924
R(calc.)	8.19
R(D5185:09)	10.82
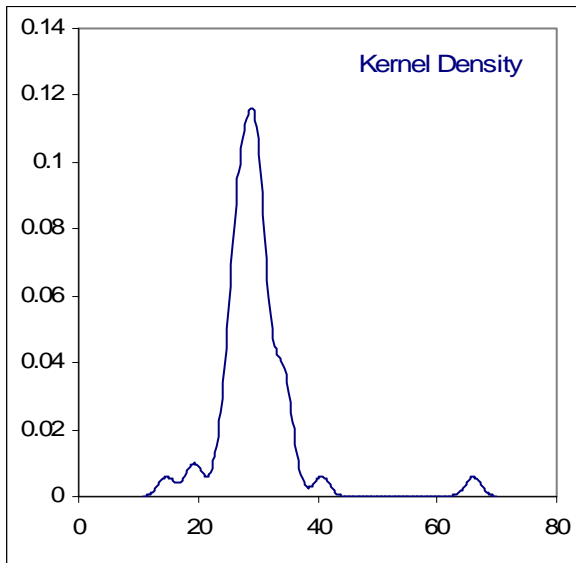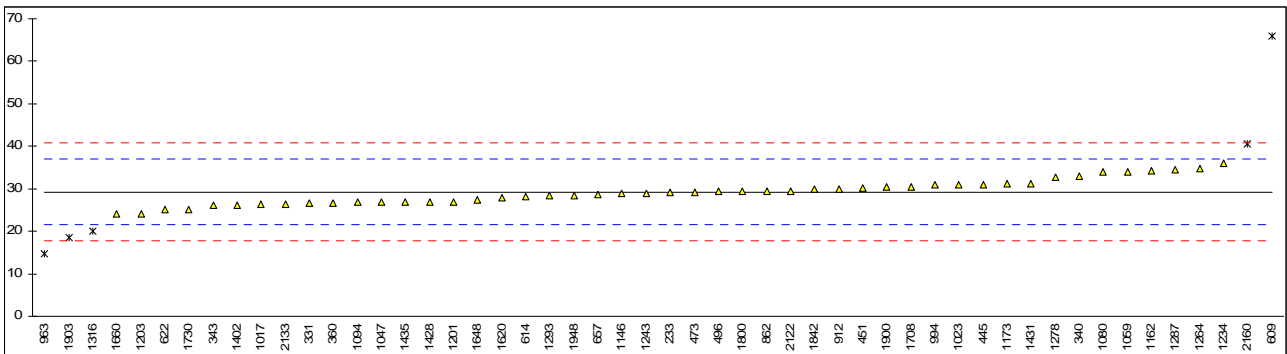
Determination of Silver (Ag) on sample #1043; results in mg/kg

lab	method	value	mark	z(targ)	remarks
233	in house	24.85		-0.19	
237		-----		-----	
252		-----		-----	
254		-----		-----	
255		-----		-----	
318		-----		-----	
331	D5185	24.00		-0.46	
340	D5185	30		1.43	
343	D5185	25		-0.15	
353		-----		-----	
360	D5185	26.2		0.23	
432		-----		-----	
445	D5185	26		0.17	
450		-----		-----	
451	D5185	27.8		0.73	
473	D5185Mod	27.7479		0.72	
496	D5185	25.3		-0.05	
593		-----		-----	
609	D5185	25		-0.15	
614	D5185	24.5		-0.30	
622	D5185	23.04		-0.76	
657	D5185	25.2		-0.08	
663		-----		-----	
840		-----		-----	
850		-----		-----	
862	D5185	29.2		1.17	
875		-----		-----	
912	D5185	25		-0.15	
963	D5185	28.86		1.07	
994	D5185	24.53		-0.29	
1013		-----		-----	
1017	D5185	25.5		0.01	
1023	D5185	26.6		0.36	
1047	D5185	23		-0.77	
1059		-----		-----	
1080	D5185	24		-0.46	
1094	D5185	25.2		-0.08	
1106		-----		-----	
1146	D5185	24.43		-0.32	
1155	DIN51397-2	24.143	C	-0.41	First reported 15.03
1162		-----		-----	
1173		-----		-----	
1201	D5185	27		0.48	
1203	D5185	26		0.17	
1231		-----		-----	
1234	in house	31		1.74	
1243		-----		-----	
1264	D6595	31.35		1.85	
1278	D5185	28.8		1.05	
1287		-----		-----	
1293	D6595	27.466		0.63	
1316	D5185	18.5		-2.19	
1402	D5185	22		-1.09	
1406		-----		-----	
1428	D5185	23		-0.77	
1431		-----		-----	
1435	D5185	24		-0.46	
1526		-----		-----	
1535		-----		-----	
1540		-----		-----	
1543		-----		-----	
1613		-----		-----	
1620	D5185	25		-0.15	
1648		-----		-----	
1650		-----		-----	
1652		-----		-----	
1660	D5185	21.72		-1.18	
1708		-----		-----	
1720		-----		-----	
1722		-----		-----	
1730	D5185	23.608		-0.58	
1800	in house	26.3		0.26	
1825		-----		-----	
1827		-----		-----	

1833		-----		-----	
1842	in house	31.1		1.77	
1850	in house	25		-0.15	
1900	D6595	40.9	C,G(0.01)	4.85	First reported 35.2
1903	inh-74	36.03	G(0.05)	3.32	
1948	D5185	22.71		-0.86	
2122	D5185	25.35		-0.04	
2133	D5185	21.085		-1.38	
2160	in house	24.23		-0.39	
4091		-----		-----	
7003		-----		-----	

normality	OK
n	44
outliers	2
mean (n)	25.46
st.dev. (n)	2.691
R(calc.)	7.53
R(D5185:09)	8.91
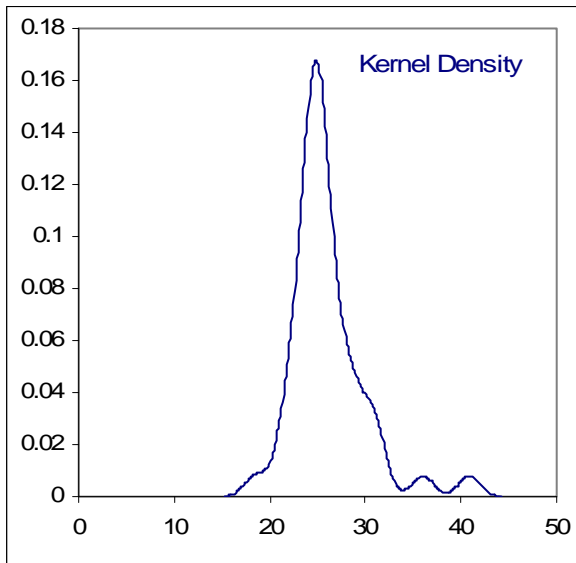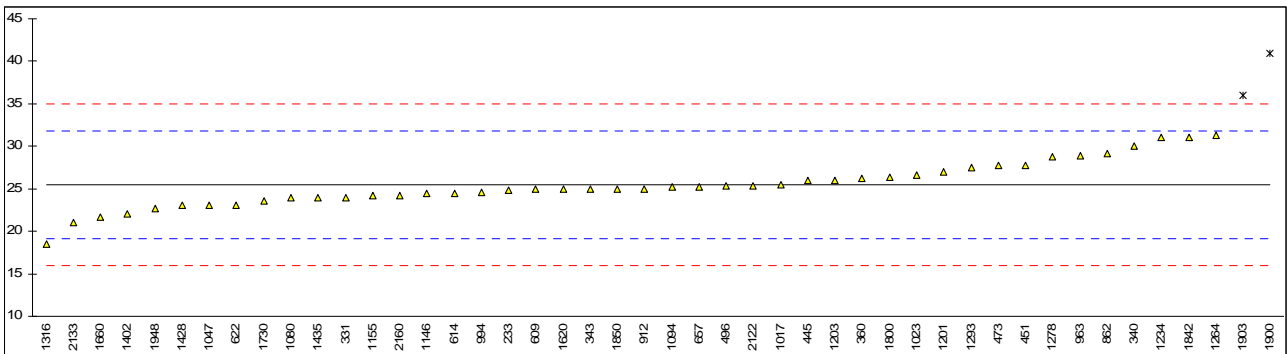
Determination of Tin (Sn) on sample #1043; results in mg/kg

lab	method	value	mark	z(targ)	remarks
233	in house	25.73		0.36	
237		-----		-----	
252		-----		-----	
254		-----		-----	
255		-----		-----	
318	D5185	24		0.03	
331	D5185	25.22		0.26	
340	D5185	34		1.90	
343	D5185	24		0.03	
353		-----		-----	
360	D5185	23.2		-0.12	
432		-----		-----	
445	D5185	25		0.22	
450		-----		-----	
451	D5185	8.8	G(0.05)	-2.81	
473	D5185Mod	25.5283		0.32	
496	D5185	23.9		0.01	
593		-----		-----	
609	D5185	25		0.22	
614	D5185	18.6		-0.98	
622	D5185	19.34		-0.84	
657	D5185	28.0		0.78	
663		-----		-----	
840		-----		-----	
850		-----		-----	
862	D5185	26.1		0.42	
875		-----		-----	
912	D5185	30		1.15	
963	D5185	24.39		0.11	
994	D5185	16.79		-1.31	
1013		-----		-----	
1017	D5185	26.4		0.48	
1023	D5185	24.8		0.18	
1047	D5185	24		0.03	
1059	in house	26		0.41	
1080	D5185	20		-0.71	
1094	D5185	23.1		-0.14	
1106		-----		-----	
1146	D5185	24.08		0.05	
1155		-----		-----	
1162	D6595	24.4		0.11	
1173	in house	24.9		0.20	
1201	D5185	15		-1.65	
1203	D5185	21		-0.53	
1231		-----		-----	
1234	in house	23		-0.15	
1243	D5185	26.0		0.41	
1264	D6595	31.40		1.41	
1278	D5185	26.0		0.41	
1287	D6595	37.7	G(0.05)	2.59	
1293	D6595	24.958		0.21	
1316	D5185	25.3		0.28	
1402	D5185	22		-0.34	
1406		-----		-----	
1428	D5185	23		-0.15	
1431	in house	20.5		-0.62	
1435	D5185	25		0.22	
1526		-----		-----	
1535		-----		-----	
1540		-----		-----	
1543		-----		-----	
1613		-----		-----	
1620	D5185	16		-1.46	
1648	D5185	21.25		-0.48	
1650		-----		-----	
1652		-----		-----	
1660	D5185	20.25		-0.67	
1708	D5185	30.5		1.25	
1720		-----		-----	
1722		-----		-----	
1730	D5185	22.899		-0.17	
1800	in house	27.4		0.67	
1825		-----		-----	
1827		-----		-----	

1833		-----	-----
1842	in house	19.4	-0.83
1850	in house	25	0.22
1900	D6595	23.21988	-0.11
1903	inh-74	15.45	-1.56
1948	D5185	22.70	-0.21
2122	D5185	25.05	0.23
2133	D5185	23.519	-0.06
2160	in house	26.70	0.54
4091		-----	-----
7003		-----	-----

normality	not OK
n	52
outliers	2
mean (n)	23.83
st.dev. (n)	3.749
R(calc.)	10.50
R(D5185:09)	15.00
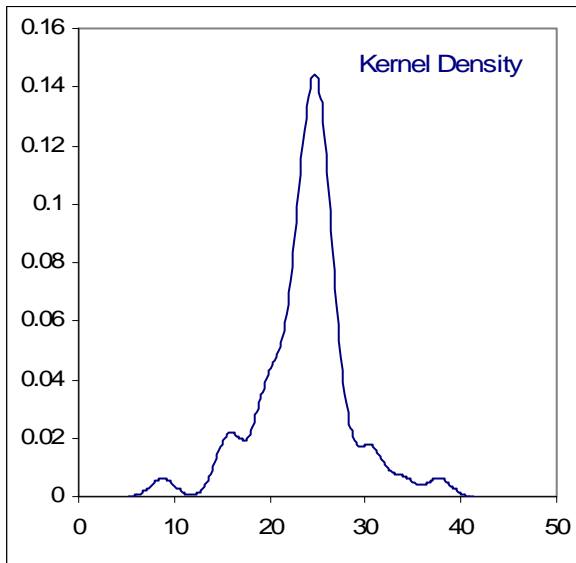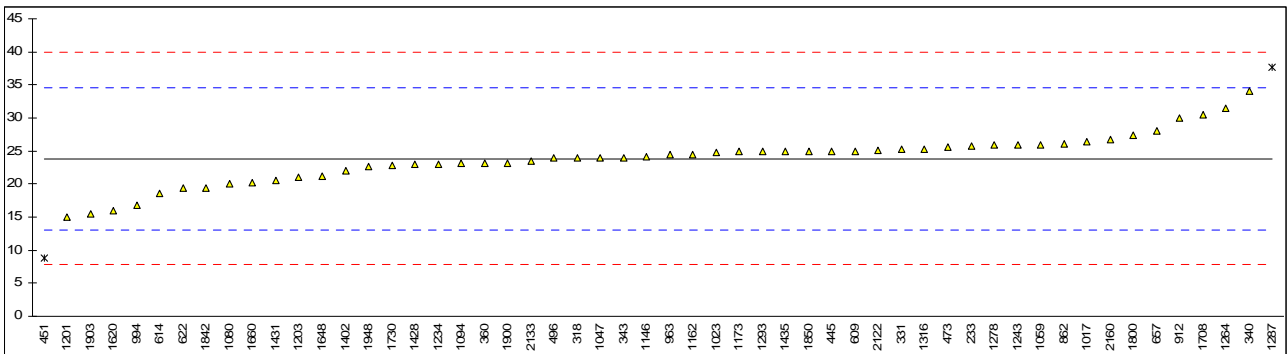
Determination of Titanium (Ti) on sample #1043; results in mg/kg

lab	method	value	mark	z(targ)	remarks
233	in house	21.54		-0.60	
237		-----		-----	
252		-----		-----	
254		-----		-----	
255		-----		-----	
318		-----		-----	
331	D5185	24.11		0.04	
340	D5185	30	G(0.05)	1.53	
343	D5185	24		0.02	
353		-----		-----	
360	D5185	22.3		-0.41	
432		-----		-----	
445	D5185	27		0.77	
450		-----		-----	
451	D5185	25.7		0.45	
473	D5185Mod	25.4947		0.39	
496	D5185	23.1		-0.21	
593		-----		-----	
609	D5185	27		0.77	
614	D5185	24.9		0.24	
622		-----		-----	
657	D5185	25.4		0.37	
663		-----		-----	
840		-----		-----	
850		-----		-----	
862	D5185	26.2		0.57	
875		-----		-----	
912	D5185	24		0.02	
963	D5185	24.02		0.02	
994	D5185	21.35		-0.65	
1013		-----		-----	
1017	D5185	24.6		0.17	
1023	D5185	26.0		0.52	
1047	D5185	23		-0.23	
1059		-----		-----	
1080	D5185	23		-0.23	
1094	D5185	22.3		-0.41	
1106		-----		-----	
1146	D5185	23.71		-0.06	
1155		-----		-----	
1162	D6595	23.0		-0.23	
1173	in house	26.6		0.67	
1201	D5185	13	G(0.01)	-2.75	
1203	D5185	22		-0.49	
1231		-----		-----	
1234	in house	16	G(0.05)	-2.00	
1243		-----		-----	
1264	D6595	23.90		-0.01	
1278	D5185	25.9		0.50	
1287		-----		-----	
1293	D6595	21.218		-0.68	
1316	D5185	23.0		-0.23	
1402	D5185	21		-0.74	
1406		-----		-----	
1428	D5185	23		-0.23	
1431		-----		-----	
1435	D5185	25		0.27	
1526		-----		-----	
1535		-----		-----	
1540		-----		-----	
1543		-----		-----	
1613		-----		-----	
1620	D5185	24		0.02	
1648		-----		-----	
1650		-----		-----	
1652		-----		-----	
1660	D5185	22.65		-0.32	
1708	D5185	25.5		0.39	
1720		-----		-----	
1722		-----		-----	
1730	D5185	21.747		-0.55	
1800	in house	25.9		0.50	
1825		-----		-----	
1827		-----		-----	

1833		-----		-----
1842	in house	26.0		0.52
1850	in house	25		0.27
1900	D6595	20.9		-0.76
1903	inh-74	26.62		0.68
1948	D5185	22.39		-0.39
2122	D5185	25.0		0.27
2133	D5185	20.028		-0.98
2160	in house	33.33	G(0.05)	2.37
4091		-----		-----
7003		-----		-----

normality	OK
n	43
outliers	4
mean (n)	23.93
st.dev. (n)	1.860
R(calc.)	5.21
R(D5185:09)	11.12
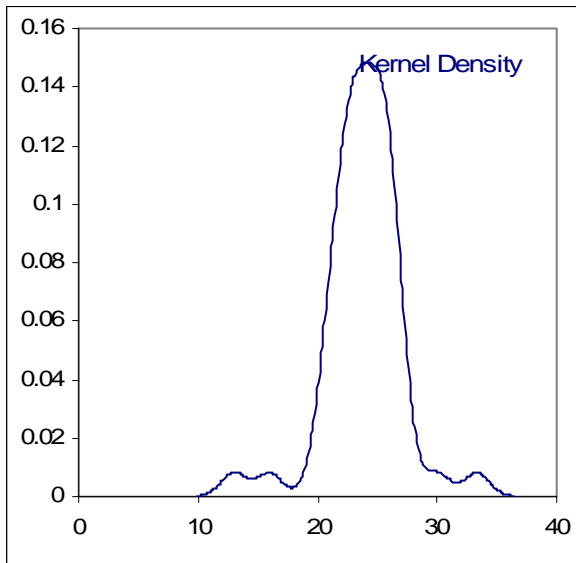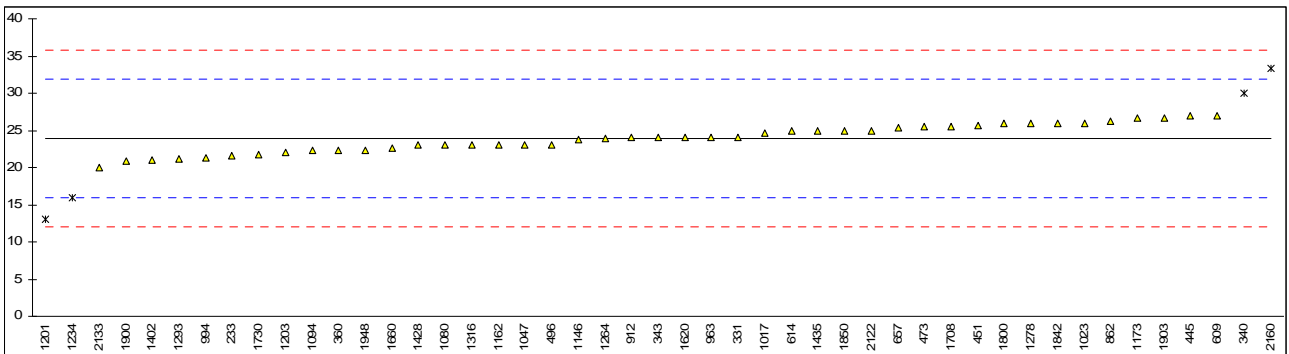
Determination of Vanadium (V) on sample #1043; results in mg/kg

lab	method	value	mark	z(targ)	remarks
233	in house	27.14		0.70	
237		-----		-----	
252		-----		-----	
254		-----		-----	
255		-----		-----	
318	D5185	26		0.36	
331	D5185	24.00		-0.22	
340	D5185	29		1.24	
343	D5185	25		0.07	
353		-----		-----	
360	D5185	22.6		-0.63	
432		-----		-----	
445	D5185	26		0.36	
450		-----		-----	
451	D5185	27.2		0.72	
473	D5185Mod	24.4116		-0.10	
496	D5185	22.9		-0.54	
593		-----		-----	
609	D5185	26		0.36	
614	D5185	25.2		0.13	
622	D5185	25.76		0.29	
657	D5185	24.5		-0.07	
663		-----		-----	
840		-----		-----	
850		-----		-----	
862	D5185	26.3		0.45	
875		-----		-----	
912	D5185	26		0.36	
963	D5185	24.88		0.04	
994	D5185	21.00		-1.10	
1013		-----		-----	
1017	D5185	24.4		-0.10	
1023	D5185	26.0		0.36	
1047	D5185	23		-0.51	
1059	in house	25		0.07	
1080	D5185	24		-0.22	
1094	D5185	21.7		-0.90	
1106		-----		-----	
1146	D5185	24.53		-0.07	
1155		-----		-----	
1162	D6595	31.0		1.83	
1173	in house	26.1		0.39	
1201	D5185	25		0.07	
1203	D5185	20		-1.39	
1231		-----		-----	
1234	in house	16	G(0.05)	-2.57	
1243	D5185	25.5		0.22	
1264	D6595	32.30		2.21	
1278	D5185	26.1		0.39	
1287		-----		-----	
1293	D6595	25.474		0.21	
1316	D5185	24.0		-0.22	
1402	D5185	22		-0.81	
1406		-----		-----	
1428	D5185	23		-0.51	
1431	in house	28.0		0.95	
1435	D5185	24		-0.22	
1526	D5185	27		0.66	
1535		-----		-----	
1540		-----		-----	
1543		-----		-----	
1613		-----		-----	
1620	D5185	24		-0.22	
1648	D5185	23.22		-0.45	
1650		-----		-----	
1652		-----		-----	
1660	D5185	19.59		-1.51	
1708	D5185	26.7		0.57	
1720		-----		-----	
1722		-----		-----	
1730	D5185	22.605		-0.63	
1800	in house	26.2		0.42	
1825		-----		-----	
1827		-----		-----	

1833		-----	-----
1842	in house	26.1	0.39
1850	in house	21	-1.10
1900	D6595	24.63844	-0.03
1903	inh-74	21.20	-1.04
1948	D5185	22.32	-0.71
2122	D5185	25.3	0.16
2133	D5185	19.772	-1.46
2160	in house	27.40	0.78
4091		-----	-----
7003		-----	-----

normality	OK
n	53
outliers	1
mean (n)	24.76
st.dev. (n)	2.537
R(calc.)	7.10
R(D5185:09)	9.55
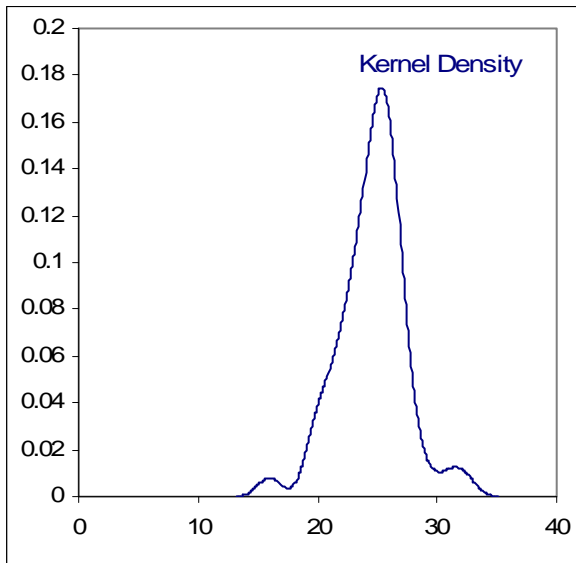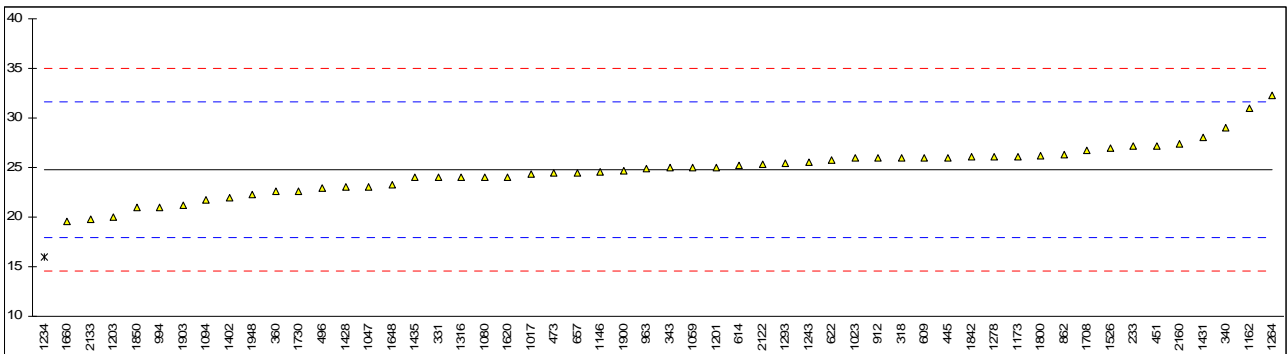
Determination of Calcium (Ca) on sample #1043; results in mg/kg

lab	method	value	mark	z(targ)	remarks
233	in house	3023		0.41	
237		-----		-----	
252		-----		-----	
254	IP308	2774.3		-1.02	
255		-----		-----	
318		-----		-----	
331	D5185	3102.33		0.86	
340	D5185	3547	G(0.05)	3.42	
343	D5185	3100		0.85	
353		-----		-----	
360	D5185	2885		-0.39	
432		-----		-----	
445	D5185	2925		-0.16	
450		-----		-----	
451	D5185	3122		0.98	
473	D5185Mod	3261.97		1.78	
496	D5185	3279		1.88	
593		-----		-----	
609	D5185	2990		0.22	
614	D5185	3150		1.14	
622	D5185	3082.78		0.75	
657	D5185	2855		-0.56	
663		-----		-----	
840		-----		-----	
850		-----		-----	
862	D5185	2955.8		0.02	
875		-----		-----	
912	D5185	2846		-0.61	
963	D5185	3018		0.38	
994	D5185	2945.7		-0.04	
1013	D5185	2990		0.22	
1017	D5185	2959		0.04	
1023	D5185	2833		-0.69	
1047	D5185	2771		-1.04	
1059	in house	2923		-0.17	
1080		-----	W	-----	Result withdrawn, malfunction of the equipment
1094	D5185	3364		2.37	
1106		-----		-----	
1146	D5185	2873		-0.46	
1155	DIN51397-2	2539.575		-2.37	
1162		-----		-----	
1173	in house	3013.9		0.35	
1201	D5185	2620		-1.91	
1203	D5185	3274		1.85	
1231		-----		-----	
1234	D4927	3103		0.87	
1243	D5185	2900		-0.30	
1264	D6595	2850.7		-0.59	
1278	D5185	3040		0.50	
1287		-----		-----	
1293	D6595	5855.4	G(0.01)	16.70	
1316	D5185	2700		-1.45	
1402	D5185	3108		0.90	
1406	D4628	2830		-0.70	
1428	D5185	2596		-2.05	
1431	in house	3286		1.92	
1435	D5185	2713		-1.38	
1526		-----		-----	
1535		-----		-----	
1540	D6481	2440		-2.95	
1543		-----		-----	
1613		-----		-----	
1620	D5185	3151		1.14	
1648	D5185	2885.9		-0.38	
1650		-----		-----	
1652		-----		-----	
1660	D5185	720	G(0.01)	-12.84	
1708	D5185	2991		0.22	
1720		-----		-----	
1722		-----		-----	
1730	D5185	2943.039		-0.05	
1800	in house	2888		-0.37	
1825		-----		-----	
1827		-----		-----	

1833		-----	-----
1842	in house	3100	0.85
1850	in house	3244	1.68
1900	D5185	2619.362	-1.92
1903	inh-74	2919.60	-0.19
1948	D5185	2752	-1.15
2122	D5185	2742.5	-1.21
2133	D5185	3225.88	1.57
2160	in house	3019.8	0.39
4091		-----	-----
7003		-----	-----

normality	OK
n	52
outliers	3
mean (n)	2952.4
st.dev. (n)	205.32
R(calc.)	574.9
R(D5185:09)	486.8
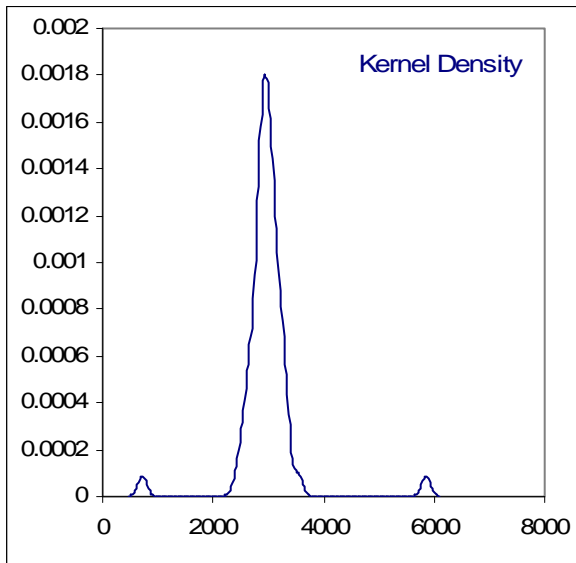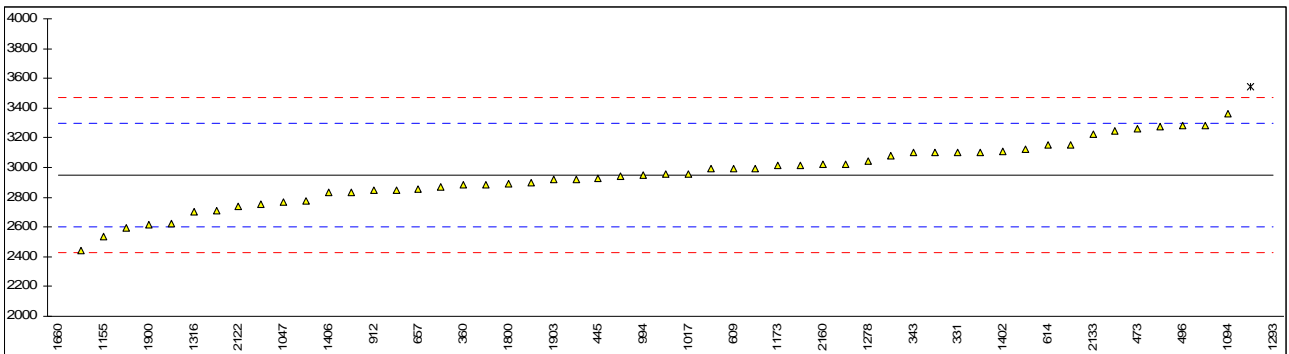
Determination of Phosphorus (P) on sample #1043; results in mg/kg

lab	method	value	mark	z(targ)	remarks
233	in house	661.87		-0.72	
237		-----		-----	
252		-----		-----	
254		-----		-----	
255		-----		-----	
318		-----		-----	
331	D5185	701.91		0.27	
340	D5185	783		2.28	
343	D5185	710		0.47	
353		-----		-----	
360	D5185	626		-1.61	
432		-----		-----	
445	D5185	706		0.37	
450		-----		-----	
451	D5185	710		0.47	
473	D5185Mod	751.255		1.49	
496	D5185	634.0		-1.41	
593		-----		-----	
609	D5185	720		0.72	
614	D5185	713.5		0.56	
622	D5185	645.45		-1.13	
657	D5185	680		-0.27	
663		-----		-----	
840		-----		-----	
850		-----		-----	
862	D5185	690.2		-0.02	
875		-----		-----	
912	D5185	686		-0.12	
963	D5185	633		-1.44	
994	D5185	718.58		0.68	
1013	D5185	770		1.96	
1017	D5185	698		0.17	
1023	D5185	717		0.64	
1047	D5185	671		-0.50	
1059	in house	667		-0.60	
1080	D5185	674		-0.42	
1094	D5185	700		0.22	
1106		-----		-----	
1146	D5185	676.00		-0.37	
1155		-----		-----	
1162	D6595	701		0.25	
1173	in house	730.8		0.99	
1201	D5185	640		-1.26	
1203	D5185	678		-0.32	
1231		-----		-----	
1234	D4927	740.33		1.22	
1243	D5185	635		-1.39	
1264	D6595	638.6		-1.30	
1278	D5185	710		0.47	
1287		-----		-----	
1293	D6595	815.65		3.09	
1316	D5185	610		-2.01	
1402	D5185	698		0.17	
1406		-----		-----	
1428	D5185	664		-0.67	
1431	in house	760	C	1.71	First reported 816
1435	D5185	670		-0.52	
1526		-----		-----	
1535		-----		-----	
1540	D6481	765		1.83	
1543		-----		-----	
1613		-----		-----	
1620	D5185	685		-0.15	
1648	D5185	616.7		-1.84	
1650		-----		-----	
1652		-----		-----	
1660	D5185	648		-1.07	
1708	D5185	678.8		-0.30	
1720		-----		-----	
1722		-----		-----	
1730	D5185	630.975		-1.49	
1800	in house	714		0.57	
1825		-----		-----	
1827		-----		-----	

1833		-----		-----
1842	in house	704		0.32
1850		-----		-----
1900	D5185	677.7736		-0.33
1903	inh-74	735.55		1.10
1948	D5185	856.5	G(0.05)	4.10
2122	D5185	618.05		-1.81
2133	D5185	715.605		0.61
2160	D5185	708.5		0.43
4091		-----		-----
7003		-----		-----

normality	OK	
n	52	
outliers	1	
mean (n)	691.0	
st.dev. (n)	45.30	
R(calc.)	126.8	
R(D5185:09)	113.0	
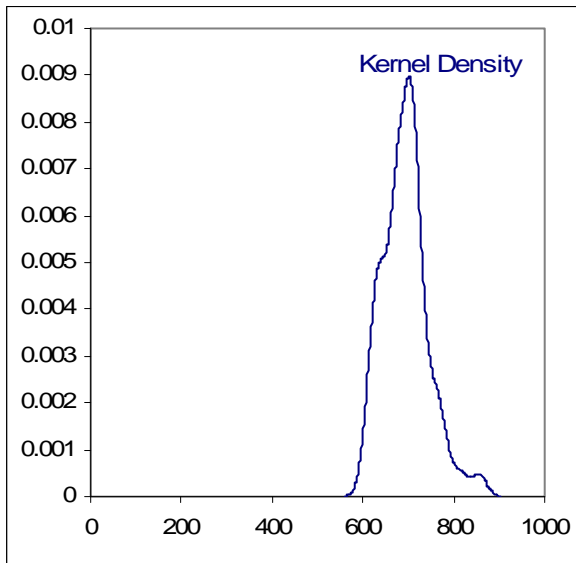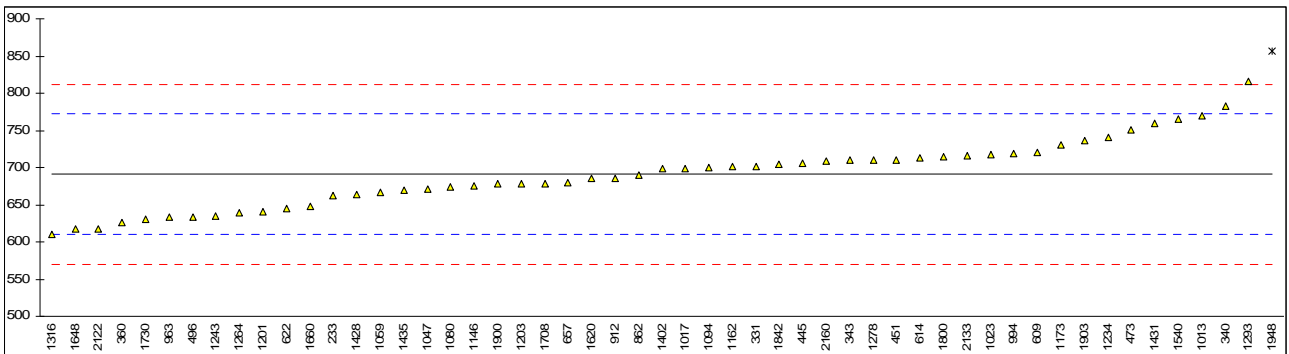
Determination of Zinc (Zn) on sample #1043; results in mg/kg

lab	method	value	mark	z(targ)	remarks
233	in house	848.24		1.24	
237		-----		-----	
252		-----		-----	
254	IP308	870.7		1.73	
255		-----		-----	
318		-----		-----	
331	D5185	808.77		0.37	
340	D5185	918		2.76	
343	D5185	910		2.59	
353		-----		-----	
360	D5185	720		-1.57	
432		-----		-----	
445	D5185	790		-0.04	
450		-----		-----	
451	D5185	777		-0.32	
473	D5185Mod	932.448		3.08	
496	D5185	729.5		-1.36	
593		-----		-----	
609	D5185	760		-0.69	
614	D5185	799		0.16	
622	D5185	677.51		-2.50	
657	D5185	715		-1.68	
663		-----		-----	
840		-----		-----	
850		-----		-----	
862	D5185	772.2		-0.43	
875		-----		-----	
912	D5185	778		-0.30	
963	D5185	731		-1.33	
994	D5185	840.31		1.06	
1013	D5185	860		1.49	
1017	D5185	788		-0.08	
1023	D5185	787		-0.10	
1047	D5185	750		-0.91	
1059	in house	755		-0.80	
1080	D5185	737		-1.20	
1094	D5185	776		-0.34	
1106		-----		-----	
1146	D5185	771.80		-0.43	
1155	DIN51397-2	831.45	C	0.87	First reported 632.755
1162		-----		-----	
1173	in house	798.9		0.16	
1201	D5185	680		-2.44	
1203	in house	832		0.88	
1231		-----		-----	
1234	D4927	777.6		-0.31	
1243	D5185	760		-0.69	
1264	D6595	877.1		1.87	
1278	D5185	780		-0.26	
1287		-----		-----	
1293	D6595	849.145		1.26	
1316	D5185	710		-1.79	
1402	D5185	837		0.99	
1406	D4628	765		-0.58	
1428	D5185	789	C	-0.06	
1431	in house	905		2.48	
1435	D5185	679		-2.46	
1526	D5185	748		-0.95	
1535		-----		-----	
1540	D6481	815		0.51	
1543		-----		-----	
1613		-----		-----	
1620	D5185	825		0.73	
1648	D5185	740.1		-1.13	
1650		-----		-----	
1652		-----		-----	
1660	D5185	930		3.02	
1708	D5185	776.3		-0.34	
1720		-----		-----	
1722		-----		-----	
1730	D5185	761.274		-0.66	
1800	in house	775		-0.36	
1825		-----		-----	
1827		-----		-----	

1833		-----	-----
1842	in house	791	-0.01
1850	in house	814	0.49
1900		819.3004	0.60
1903	inh-74	660.22	-2.87
1948	D5185	754.2	-0.82
2122	D5185	727.80	-1.40
2133	D5185	836.319	0.98
2160	in house	786.9	-0.10
4091		-----	-----
7003	D4691	883.4	2.01

normality	OK	
n	58	
outliers	0	
mean (n)	791.7	
st.dev. (n)	63.61	
R(calc.)	178.1	
R(D5185:09)	128.1	
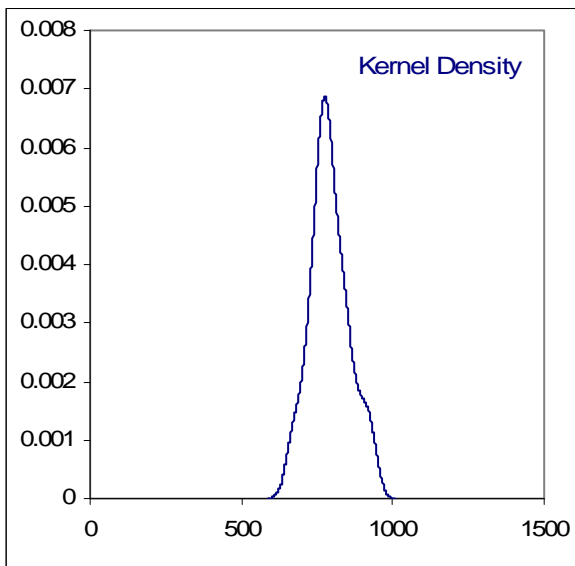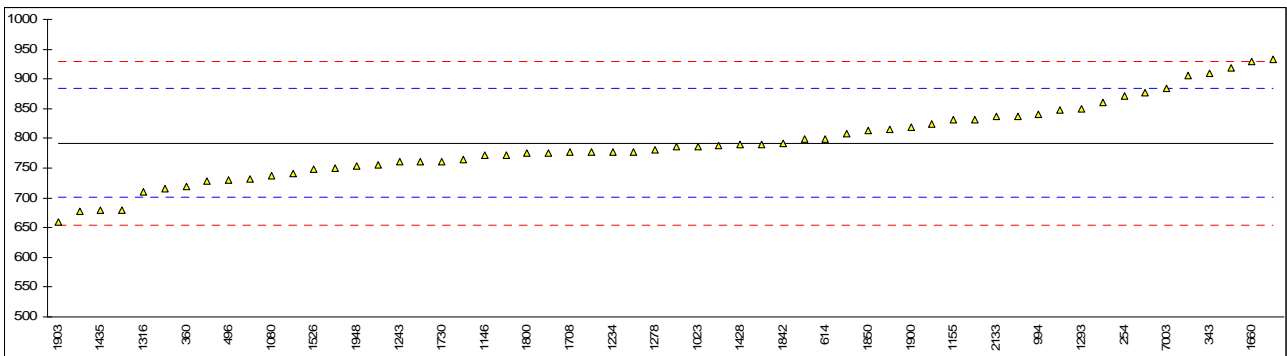
APPENDIX 2

List of number of participants per country

```
 1 laboratory in   AUSTRALIA
 1 laboratory in   AUSTRIA
 1 laboratory in   AZERBAIJAN
 2 laboratories in BELGIUM
 1 laboratory in   BULGARIA
 1 laboratory in   CROATIA
 1 laboratory in   DENMARK
 1 laboratory in   ECUADOR
 2 laboratories in FRANCE
 2 laboratories in GERMANY
 1 laboratory in   GHANA
 4 laboratories in GREECE
 1 laboratory in   HONG KONG
 2 laboratories in HUNGARY
 1 laboratory in   INDIA
 1 laboratory in   INDONESIA
 1 laboratory in   IRAN
 1 laboratory in   IRELAND
 2 laboratories in ITALY
 1 laboratory in   JORDAN
 2 laboratories in KENYA
 1 laboratory in   LATVIA
 2 laboratories in MALAYSIA
 1 laboratory in   NEGARA BRUNEI DARUSSALAM
 1 laboratory in   NIGERIA
 3 laboratories in NORWAY
 3 laboratories in P.R. of CHINA
 4 laboratories in POLAND
 1 laboratory in   PORTUGAL
 2 laboratories in REPUBLIC OF MACEDONIA
 1 laboratory in   RUSSIA
 1 laboratory in   SAUDI ARABIA
 3 laboratories in SERBIA
 1 laboratory in   SINGAPORE
 1 laboratory in   SLOVENIA
 4 laboratories in SPAIN
 1 laboratory in   SUDAN
 1 laboratory in   SWEDEN
 1 laboratory in   TANZANIA
 3 laboratories in THAILAND
 3 laboratories in THE NETHERLANDS
 5 laboratories in TURKEY
 1 laboratory in   U.A.E.
 9 laboratories in UNITED KINGDOM
 1 laboratory in   VIETNAM
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APPENDIX 3

Abbreviations:

C   = final result after checking of first reported suspect result
D(0.01)   = outlier in Dixon's outlier test
D(0.05)   = straggler in Dixon's outlier test
G(0.01)   = outlier in Grubbs' outlier test
G(0.05)   = straggler in Grubbs' outlier test
DG(0.01)   = outlier in Double Grubbs' outlier test
DG(0.05)   = straggler in Double Grubbs' outlier test
ex   = excluded from calculations
W   = results withdrawn on request of the participants
fr.   = first reported
S   = scope of the reported method is not applicable
n.a.   = not applicable
SDS   = Safety Data Sheet

Literature:

1   i.i.s. Interlaboratory Studies, Protocol for the Organization, Statistics and Evaluation, January
2010   (version 3.2)
2   ASTM E178-89
3   ASTM E1301-89
4   ISO 5725-86
5   ISO 5725, parts 1-6, 1994
6   M. Thompson and R. Wood, J. AOAC Int, 76, 926, (1993)
7   W.J. Youden and E.H. Steiner, Statistical Manual of the AOAC, (1975)
8   IP 367/84
9   DIN 38402 T41/42
10   P.L. Davies, First reported Z. Anal. Chem, 331, 513, (1988)
11   J.N. Miller, Analyst, 118, 455, (1993)
12   Analytical Methods Committee Technical brief, No4 January 2001.
13   The Royal Society of Chemistry 2002, Analyst 2002, 127 pages 1359-1364, P.J. Lowthian and M.
           Thompson (see http://www.rsc.org/suppdata/an/b2/b205600n/).