Results of Proficiency Test
Used Lubricating Oil
May 2011

-- empty page --

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 2010/2011, it was decided to continue the round robin for the analyses of used Lubricating Oil. In this interlaboratory study, 77 laboratories in 46 different countries have participated. See appendix 2 for the number of participants per country. In this report, the results of the used Lubricating Oil proficiency test are presented and discussed.

2   SET UP

The Institute for Interlaboratory Studies (iis) in Spijkenisse, the Netherlands, was the organizer of this proficiency test. It was decided to send 2 different samples (1 bottle of 0.5L (labelled #11042) and 1 bottle of 100 mL, 50% filled (labelled #11043)) 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 'iis Interlaboratory Studies: Protocol for the Organization, Statistics and Evaluation' of January 2010 (iis-protocol, version 3.2).

2.3   CONFIDENTIALITY STATEMENT

All data presented 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 60 litre bulk material was homogenised in a precleaned 60L drum. After homogenisation, 88 subsamples were transferred to 0.5 L brown glass bottles and labelled #11042. The homogeneity of the subsamples #11042 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 6 stratified randomly selected samples.

	Density @ 20°C in kg/L	Water in %M/M
Sample #11042-1	0.8953	0.083
Sample #11042-2	0.8952	0.077
Sample #11042-3	0.8952	0.074
Sample #11042-4	0.8952	0.076
Sample #11042-5	0.8952	0.073
Sample #11042-6	0.8953	0.069

Table 1: homogeneity test results of subsamples #11042

From the above test results, the repeatabilities were calculated and compared with 0.3 times the corresponding reproducibilities in agreement with the procedure of ISO13528, Annex B2 in the next table:

	Density @ 20 °C in kg/L	Water in %M/M
r (sample #11042)	0.00014	0.013
reference test	ASTM D4052:09	ASTM D6304:07
0.3 * R (reference test)	0.00015	0.027

Table 2: evaluation of repeatabilities of the subsamples #11042

The second bulk material, used Lubricating Oil, enriched 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, 93 subsamples were transferred to 100 mL PE bottles, each filled with approximately 50 mL material and labelled #11043. The homogeneity of the subsamples #11043 was checked by the determination of Calcium and Zinc in accordance with ASTM D5185:09 on 8 stratified randomly selected samples.

	Calcium in mg/kg	Zinc in mg/kg
Sample #11043-1	4255	770
Sample #11043-2	4230	760
Sample #11043-3	4213	765
Sample #11043-4	4245	760
Sample #11043-5	4210	760
Sample #11043-6	4210	760
Sample #11043-7	4200	760
Sample #11043-8	4260	780

Table 3: homogeneity test results of subsamples #11043

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:

	Calcium in mg/kg	Zinc in mg/kg
r (sample #11043)	64	20
reference test	ASTM D5185:09	ASTM D5185:09
0.3 * R (reference test)	233	37

Table 4: evaluation of repeatabilities of the subsamples #11042

The calculated repeatabilities are all less than 0.3 times the corresponding reproducibilities of the reference methods. Therefore, homogeneity of the subsamples #11042 and #11043 were assumed.

To each of the participating laboratories 2 samples of Lubricating Oil (1*0.5 L brown glass bottle labelled #11042, 1*100 mL PE bottle labelled #11043) were sent on April 20, 2011.

2.5 STABILITY OF THE SAMPLES

The stability of Lubricating Oil, packed in the brown glass bottles and PE Bottles, was checked. The material was found sufficiently stable for the period of the proficiency test.

2.6 ANALYSES

The participants were requested to determine on sample #11042: Acid Number (Total), Base Number (Total), Density @ 15°C, Flash Point PMcc, Kinematic Viscosity @ 40°C and @ 100°C and Water.

On sample #11043 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 'iis Interlaboratory Studies: Protocol for the Organisation, Statistics and Evaluation' (iis-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 Ecuador, Ghana, Nigeria, Russia, Thailand and Zambia. Thirteen participants reported after the final reporting date and three participants did not report any results at all. Not all laboratories were able to report all analyses requested. In total 75 participants reported 1257 results. Observed were 52 outlying results, which is 4.1% 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: Base Number, Density @15°C, Flash Point, Kinematic Viscosity @40⁰C, Chromium, Copper, Magnesium, Sodium, Tin and Vanadium. 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.
As the number of outliers of the reported results from laboratory 902 and 1402 is very large, it was decided to excluded also the other reported results for the elements from statistical evaluation.

Acid Number (Total): This determination was problematic. One statistical outlier was observed. Another four test results were excluded from the statistical evaluation, as the reported test method is not equivalent with ASTM D664. After excluding the five test results, the calculated reproducibility is still not in agreement with ASTM D664:09a.

Base Number (Total): This determination was problematic. One statistical outlier was observed. Another seven test results were excluded from the statistical evaluation, as the reported test method is not equivalent with ASTM D2896. After excluding the eight test results, the calculated reproducibility is still not in agreement with ASTM D2896:07a

Density @ 15°C: This determination was very problematic. Three statistical outliers were observed. After rejection of the statistical outliers, the calculated reproducibility is not at all in agreement with the requirements of ASTM D4052:09. The large spread may be explained by not correcting the test result for viscosity. (see density tables)

Flash Point PMcc: This determination was very problematic. No statistical outliers were observed. However, the calculated reproducibility is not at all in agreement with the requirements of ASTM D93:10a 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. Only two statistical outliers were observed. After rejection of the statistical outliers, the calculated reproducibility is in good agreement with the requirements of ASTM D445:11a.

Kin.Visco.@ 100°C: This determination was not problematic. Only two statistical outliers were observed. After rejection of the statistical outliers, the calculated reproducibility is in good agreement with the requirements of ASTM D445:11a.

Water: This determination was problematic for a number of laboratories. No statistical outliers were observed. However, the majority of the reporting results were excluded for statistical evaluation, as the reported test method is not in agreement with the preferred test method ASTM D6304 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.
After exclusion of all data, except ASTM D6304 method C, 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.

Aluminium: This determination was not problematic. Only one statistical outlier was observed and one test result was excluded for statistical evaluation. The calculated reproducibility of the remaining test results is in agreement with the requirements of ASTM D5185:09.

Barium: This determination maybe not problematic. Four 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. Only one statistical outlier was observed and one test result was excluded for statistical evaluation. However, the

calculated reproducibility of the remaining test results is not in agreement with the requirements of ASTM D5185:09.

Copper: This determination was very problematic. Only one statistical outlier was observed and one test result was excluded for statistical evaluation. The calculated reproducibility of the remaining test results is not at all in agreement with the requirements of ASTM D5185:09.

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

Lead: This determination was not problematic. No statistical outliers were observed, but two results were excluded for statistical evaluation. The calculated reproducibility of the remaining test results is in good 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 problematic. One statistical outlier and one false negative result was observed. The calculated reproducibility after rejection of the statistical outlier is not in agreement with the strict estimated requirements, calculated using the Horwitz equation.

Magnesium: This determination was problematic. Two statistical outliers were observed and two results were excluded for statistical evaluation. The calculated reproducibility of the remaining test results is not in agreement with the requirements of ASTM D5185:09.

Manganese: This determination was very problematic. Only one statistical outlier was observed and one result was excluded for statistical evaluation. However, the calculated reproducibility of the remaining test results is not at all in agreement with the requirements of ASTM D5185:09.

Molybdenum: This determination was not problematic. Three statistical outliers were observed and one result was excluded for statistical evaluation. However, the calculated reproducibility of the remaining test results is in full agreement with the requirements of ASTM D5185:09.

Nickel: This determination was not problematic. Only one statistical outlier and one false negative was observed and one result was excluded for statistical evaluation. The calculated reproducibility of the remaining test results is (almost) in agreement with the requirements of ASTM D5185:09.

Sodium:
This determination was very problematic. Only one statistical outlier was observed and two results were excluded for statistical evaluation. However, the calculated reproducibility of the remaining test results is not at all in agreement with the requirements of ASTM D5185:09.

Silicon:
This determination was not problematic. Only one statistical outlier was observed and two results were excluded for statistical evaluation. The calculated reproducibility of the remaining test results is in full agreement with the requirements of ASTM D5185:09.

Silver:
This determination was problematic. Two statistical outliers and one false negative were observed. The calculated reproducibility after rejection of the statistical outliers is not in agreement with the requirements of ASTM D5185:09.

Tin:
This determination was not problematic. Four statistical outliers and one false negative were observed and one result was excluded for statistical evaluation. However, the calculated reproducibility of the remaining test results is in good agreement with the requirements of ASTM D5185:09.

Titanium:
This determination was not problematic. Three statistical outliers and one false negative were observed and one result was excluded for statistical evaluation. However, the calculated reproducibility of the remaining test results is in good agreement with the requirements of ASTM D5185:09.

Vanadium:
This determination was problematic. Only one statistical outlier and one false negative were observed and one result was excluded for statistical evaluation. The calculated reproducibility of the remaining test results is in agreement with the requirements of ASTM D5185:09.

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

Phosphorus:
This determination was not problematic. Three statistical outliers were observed and one result was excluded for statistical evaluation. However, the calculated reproducibility of the remaining test results is in full agreement with the requirements of ASTM D5185:09.

Zinc:
This determination was problematic for several laboratories. Four statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in full 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	39	2.87	1.85	1.26
Base Number (Total)	mg KOH/g	37	9.38	0.99	0.66
Density @ 15°C	kg/L	51	0.8953	0.0012	0.0005
Flash Point PMcc	^{o}C	53	201.0	18.0	10.0
Kinematic Viscosity @ 40°C	mm^2/s	59	123.48	2.43	9.15
Kinematic Viscosity @ 100°C	mm^2/s	57	13.504	0.326	0.860
Water	mg/kg	10	664.0	547.7	833.7

Table 5: reproducibilities of results of sample #11042

Parameter	Unit	n	Average	2.8 * sd	R (lit)
Aluminium as Al	mg/kg	46	10.66	6.95	7.03
Barium as Ba	mg/kg	38	23.76	9.14	10.88
Chromium as Cr	mg/kg	51	8.74	4.92	3.04
Copper as Cu	mg/kg	50	20.73	8.29	4.98
Iron as Fe	mg/kg	46	15.14	4.41	4.57
Lead as Pb	mg/kg	50	8.55	4.03	6.49
Lithium as Li	mg/kg	11	25.27	9.84	6.96
Magnesium as Mg	mg/kg	43	26.08	10.72	8.87
Manganese as Mn	mg/kg	41	8.89	4.24	1.79
Molybdenum as Mo	mg/kg	37	7.66	2.80	2.72
Nickel as Ni	mg/kg	47	8.00	4.50	4.24
Sodium as Na	mg/kg	36	55.79	49.50	19.12
Silicon as Si	mg/kg	44	15.47	7.79	8.44
Silver as Ag	mg/kg	39	8.18	3.49	2.86
Tin as Sn	mg/kg	40	7.31	3.84	7.21
Titanium as Ti	mg/kg	33	7.45	1.73	6.42
Vanadium as V	mg/kg	45	7.89	3.52	2.72
Calcium as Ca	mg/kg	47	4242	847	780
Phosphorus as P	mg/kg	42	686	118	113
Zinc as Zn	mg/kg	51	769	123	124

Table 6: reproducibilities of results of sample #11043
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 several tests there is 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 2011 WITH PREVIOUS PTS

	May 2011	May 2010	April 2009	April 2008
Number of reporting participants	75	82	79	86
Number of results reported	1257	1409	1125	963
Statistical outliers	52	88	74	64
Percentage outliers	4.1%	6.2%	6.6%	6.6%

Table 7: comparison with previous proficiency tests

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 2011	May 2010	April 2009	April 2008
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

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.e.: not evaluated

APPENDIX 1

Determination of Acid Number (Total) on sample #11042; results in mg KOH/g

lab	method	value	mark	z(targ)	remarks
230		-----		-----	
233	D974	3.46	ex	1.30	Result excluded, see §4.1
237	D664	4.13		2.79	
252		-----		-----	
254		-----		-----	
255		-----		-----	
260		-----		-----	
311	D664	0.86	G(0.05)	-4.46	
318		-----		-----	
331	D664	2.63		-0.54	
340	D664	1.899		-2.16	
343	D664	2.528		-0.76	
349		-----		-----	
353	IP177	1.739		-2.51	
360	D664	2.618		-0.56	
398	D664	<0.1		-----	False negative?
420	ISO6619	3.90		2.28	
432		-----		-----	
450		-----		-----	
451	D664	3.87		2.21	
473		-----		-----	
496	D664	3.376		1.12	
511	In house	2.48	ex	-0.87	Result excluded, see §4.1
562	D974	1.40	C,ex	-3.26	First reported 1.07, Result excluded, see §4.1
593		-----		-----	
609	D664	2.1198		-1.67	
613		-----		-----	
614		-----		-----	
657	D664	3.10		0.51	
663		-----		-----	
840	D664	2.256		-1.36	
862	D664	3.009		0.30	
875		-----		-----	
902	D664	2.55		-0.71	
912		-----		-----	
963		-----		-----	
994	D664	3.33		1.01	
1013		-----		-----	
1017	D974	3.2961	ex	0.94	Result excluded, see §4.1
1023	D664	3.10		0.51	
1059	ISO6619	2.48		-0.87	
1080	D664	2.29		-1.29	
1094	D664	2.885		0.03	
1106	D664	4.4203		3.43	
1128		-----		-----	
1146	D664	2.852		-0.04	
1173		-----		-----	
1203	D664	2.75		-0.27	
1231		-----		-----	
1271	D664	3.185		0.69	
1278		-----		-----	
1293	ISO12634	4.057		2.63	
1316	D664	3.13		0.57	
1358		-----		-----	
1402	D664	2.6		-0.60	
1406	D664	3.10		0.51	
1428		-----		-----	
1431	D664	2.81		-0.14	
1526		-----		-----	
1613		-----		-----	
1620	D664	3.04		0.37	
1622	D664	2.88		0.02	
1648		-----		-----	
1650	D664	2.84		-0.07	
1660		-----		-----	
1708	D664	1.776		-2.43	
1720	D664	2.85	C	-0.05	First reported 0.77
1730		-----		-----	
1800		-----		-----	
1827	D664	3.5245		1.45	
1833	D664	3.41	C	1.19	First reported 1.05
1850	ISO6619	2.40		-1.05	
1900	D664	2.835		-0.08	
1948		-----		-----	

2122	IP177	1.855	-2.25
2133	D664	1.8853	-2.19
2160		-----	-----

normality	OK
n	39
outliers	1
mean (n)	2.872
st.dev. (n)	0.6594
R(calc.)	1.846
R(D664:09a)	1.264
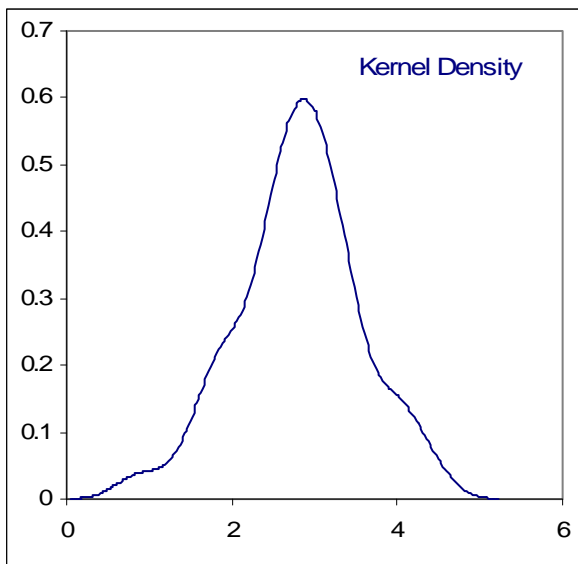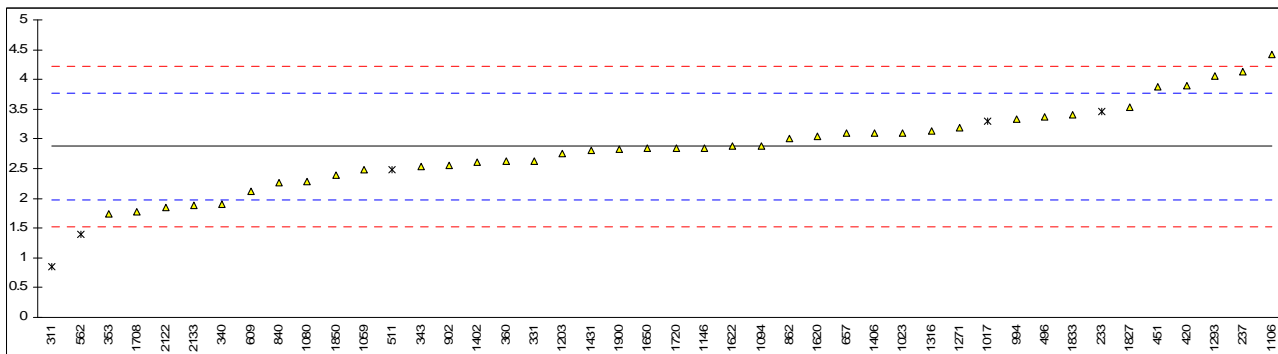
Determination of Base Number (Total) on sample #11042; results in mg KOH/g

lab	method	value	mark	z(targ)	remarks
230		-----		-----	
233	D974	9.90	ex	2.24	Result excluded, see §4.1
237	D2896	4.00	G(0.01)	-22.93	
252		-----		-----	
254		-----		-----	
255	D2896	8.79		-2.50	
260		-----		-----	
311	D2896	9.42		0.19	
318		-----		-----	
331	D2896	9.3		-0.32	
340	D2896	9.200		-0.75	
343	D2896	9.55		0.75	
349	D4739	7.8	C,ex	-6.72	First reported 8.5, Result excluded, see §4.1
353		-----		-----	
360	D2896	9.027		-1.48	
398	D2896	9.57		0.83	
420	D2896	9.46		0.36	
432	D2896	9.489		0.49	
450		-----		-----	
451	D2896	9.28		-0.41	
473	D2896	9.0193		-1.52	
496	D2896	9.400		0.11	
511	In house	9.48	ex	0.45	Result excluded, see §4.1
562	D4739	9.10	C,ex	-1.17	First reported 8.55, Result excluded, see §4.1
593		-----		-----	
609	D2896	9.5121		0.58	
613	D2896	9.25		-0.53	
614		-----		-----	
657	D2896	9.70		1.39	
663		-----		-----	
840	D2896	10.12		3.18	
862	D2896	9.179		-0.84	
875		-----		-----	
902	D2896	9.21		-0.70	
912		-----		-----	
963		-----		-----	
994	D4739	10.1	C,ex	3.09	First reported 10.7, Result excluded, see §4.1
1013		-----		-----	
1017		-----		-----	
1023	D2896	9.28		-0.41	
1059	ISO3771	9.4		0.11	
1080	D2896	8.83		-2.33	
1094		-----		-----	
1106		-----		-----	
1128		-----		-----	
1146	D2896	9.36		-0.06	
1173		-----		-----	
1203	D2896	8.6		-3.31	
1231		-----		-----	
1271	ISO3771	9.39		0.06	
1278		-----		-----	
1293	ISO12634	0.8745	C,ex	-36.27	First reported 8.318, Result excluded, see §4.1
1316		-----		-----	
1358		-----		-----	
1402	D2896	9.3		-0.32	
1406	D2896	9.48		0.45	
1428		-----		-----	
1431	D2896	8.80		-2.45	
1526		-----		-----	
1613	D2896	9.58		0.87	
1620	D2896	9.35	C	-0.11	First reported 1039
1622	D2896	9.87		2.11	
1648	D2896	9.729		1.51	
1650	D2896	9.33		-0.19	
1660		-----		-----	
1708	D2896	9.38		0.02	
1720		-----		-----	
1730		-----		-----	
1800		-----		-----	
1827	D2896	9.5455		0.73	
1833		-----		-----	
1850	ISO3771	9.37		-0.02	
1900	D2896	9.285		-0.38	
1948		-----		-----	

2122	IP400	8.36	ex	-4.33	Result excluded, see §4.1
2133	D2896	10.52		4.89	
2160		-----		-----	

normality	not OK
n	37
outliers	1
mean (n)	9.375
st.dev. (n)	0.3538
R(calc.)	0.991
R(D2896:07a)	0.656
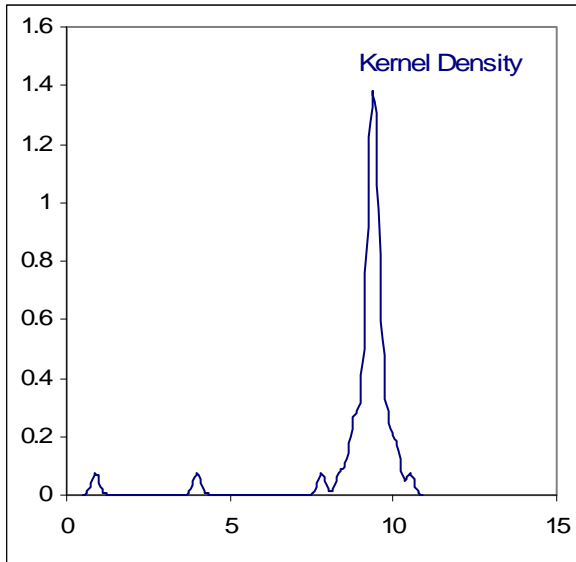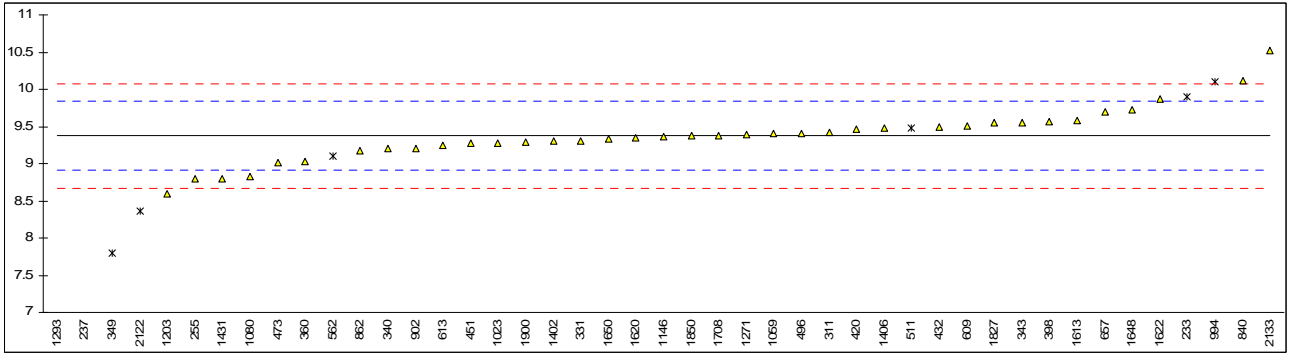
Determination of Density @ 15°C on sample #11042; results in kg/L

lab	method	value	mark	z(targ)	remarks
230		-----		-----	
233		-----		-----	
237	D4052	0.8954		0.54	
252		-----		-----	
254		-----		-----	
255	D1298	0.8944		-5.06	
260		-----		-----	
311	D4052	0.8951		-1.14	
318		-----		-----	
331		-----		-----	
340	D4052	0.89551		1.15	
343	D4052	0.89543		0.71	
349		-----		-----	
353	IP365	0.8951		-1.14	
360	D4052	0.8951		-1.14	
398	D4052	0.8959		3.34	
420	ISO12158	0.8957		2.22	
432	D4052	0.89590		3.34	
450		-----		-----	
451	D4052	0.896		3.90	
473		-----		-----	
496	D4052	0.89508		-1.25	
511	D4052	0.8955		1.10	
562		-----		-----	
593	D4052	0.8956	C	1.66	First reported 0.8965
609	D4052	0.89510		-1.14	
613	D4052	0.89483		-2.65	
614	D4052	0.8957		2.22	
657	D4052	0.8951		-1.14	
663	D4052	0.8952		-0.58	
840	D4052	0.89519		-0.64	
862	D4052	0.89509		-1.20	
875	D4052	0.8957		2.22	
902	D4052	0.89516		-0.81	
912	D4052	0.8951		-1.14	
963	D4052	0.8954		0.54	
994	D4052	0.8961		4.46	
1013	D4052	0.8951		-1.14	
1017	D4052	0.8959		3.34	
1023	D4052	0.8951		-1.14	
1059	D4052	0.8956		1.66	
1080	D4052	0.895		-1.70	
1094	D4052	0.89519		-0.64	
1106	D5002	0.89580		2.78	
1128		-----		-----	
1146	D4052	0.89509		-1.20	
1173		-----		-----	
1203	D4052	0.895		-1.70	
1231		-----		-----	
1271	D4052	0.8916	C,G(0.01)	-20.74	First reported 892.9
1278		-----		-----	
1293	D5002	0.8953		-0.02	
1316	D4052	0.8947		-3.38	
1358	IP160	0.8759	G(0.01)	-108.66	
1402	D4052	0.8959		3.34	
1406	ISO12185	0.89544	C	0.76	First reported 895.44
1428	ISO12185	0.8951		-1.14	
1431	D4052	0.89465		-3.66	
1526	D5002	0.8953		-0.02	
1613		-----		-----	
1620	D4052	0.8952		-0.58	
1622	D4052	0.8951		-1.14	
1648	D1298	0.89624		5.24	
1650	D4052	0.8940	C	-7.30	First reported 894.0
1660		-----		-----	
1708	D4052	0.8957		2.22	
1720	D4052	0.8968	G(0.05)	8.38	
1730		-----		-----	
1800		-----		-----	
1827		-----		-----	
1833	D4052	0.8951		-1.14	
1850	D4052	0.8952		-0.58	
1900		-----		-----	
1948	D4052	0.8952	C	-0.58	First reported 895.2

2122		-----	-----
2133	D4052	0.89520	-0.58
2160		-----	-----

normality	not OK
n	51
outliers	3
mean (n)	0.89530
st.dev. (n)	0.000425
R(calc.)	0.00119
R(D4052:09)	0.00050
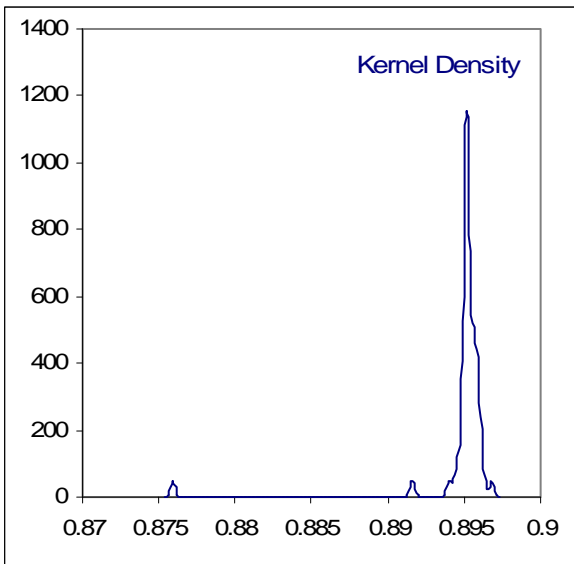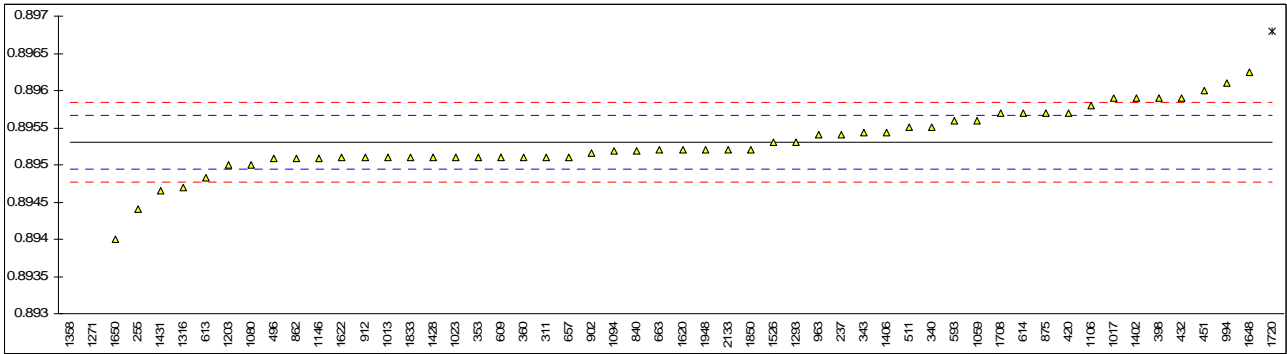
Determination of Flash Point PMcc on sample #11042; results in °C

lab	method	value	mark	z(targ)	remarks
230	D3828	206		1.40	
233		-----		-----	
237	D93-MF	188.0		-3.64	
252		-----		-----	
254		-----		-----	
255		-----		-----	
260	D93-MF	204.6		1.00	
311		-----		-----	
318		-----		-----	
331	D93-AE	204		0.84	
340	D93-AF	205.0		1.12	
343	D93-AE	190	C	-3.08	First reported 188
349		-----		-----	
353	IP34-ME	190.0		-3.08	
360	D93-AE	202.0		0.28	
398	D93-MF	198		-0.84	
420	ISO2719-AF	202.5		0.42	
432	D93-AE	190		-3.08	
450		-----		-----	
451	D93-AE	206		1.40	
473	D93-AE	206.0		1.40	
496		-----		-----	
511	D93-AF	205.3		1.20	
562		-----		-----	
593	D93-ME	209		2.24	
609	D3828-MF	197.0		-1.12	
613		-----		-----	
614	D93-MF	202.07		0.30	
657	D93-AF	204.0		0.84	
663		-----		-----	
840	D93-MF	190.2		-3.03	
862	D93-MF	192	C	-2.52	First reported 187
875	D93-MF	192.0		-2.52	
902	D93-MF	214		3.64	
912	D93-AE	207		1.68	
963	D93-MF	192.0		-2.52	
994	D93-MF	200		-0.28	
1013		-----		-----	
1017	D93-AE	202.0		0.28	
1023	D93-	205		1.12	
1059	ISO2719-AE	207.5		1.82	
1080	D93-AE	206		1.40	
1094	D93-AE	205.0		1.12	
1106	D93-AE	205.0		1.12	
1128		-----		-----	
1146	In house-AE	203.0		0.56	
1173	IP34-MF	199.95		-0.30	
1203	D93-MF	194		-1.96	
1231		-----		-----	
1271	ISO2719-AF	196.2		-1.35	
1278		-----		-----	
1293	D6450-AE	206		1.40	
1316		-----		-----	
1358	IP34-AF	202		0.28	
1402	D93-AE	189.0		-3.36	
1406		-----		-----	
1428	D93-AE	202.5		0.42	
1431	D93-AF	203.5		0.70	
1526		-----		-----	
1613		-----		-----	
1620	D93-AE	200.5		-0.14	
1622	D93-MF	196.0		-1.40	
1648	D93-ME	210.2		2.57	
1650	D93-AE	189.5		-3.22	
1660		-----		-----	
1708	D93-AE	203.5		0.70	
1720	D93-AF	204.5		0.98	
1730		-----		-----	
1800		-----		-----	
1827		-----		-----	
1833	D93-MF	204		0.84	
1850	ISO2719-AE	203		0.56	
1900	D3828	212		3.08	
1948	D93-AE	204		0.84	

				Only MF	Only ME	Only AE	Only AF
2122	D93-MF	201	0.00				
2133	D93-AE	206.0	1.40				
2160	D93-MF	196.3	-1.32				
	normality	not OK		OK	n.a.	not OK	OK
	n	53		17	3	22	8
	outliers	0		0	0	0	0
	mean (n)	201.0		197.7	204.4	201.7	202.9
	st.dev. (n)	6.44		6.42	9.03	6.09	2.93
	R(calc.)	18.0		18.0	25.3	17.1	8.2
	R(D93-B:10a)	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
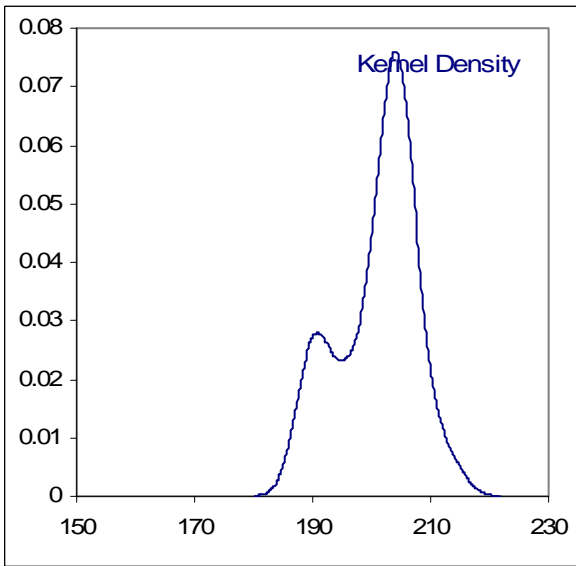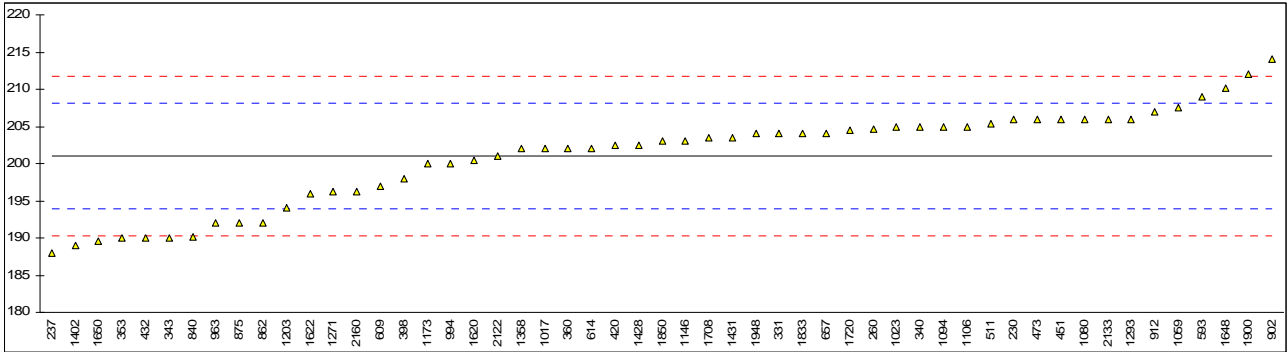
Determination of Kinematic Viscosity @ 40°C on sample #11042; results in mm^2/s

lab	method	value	mark	z(targ)	remarks
230	D445	124.360		0.27	
233	D7279	124.00		0.16	
237	D445	124.0		0.16	
252		-----		-----	
254		-----		-----	
255	D445	121.16	C	-0.71	First reported 128.59
260	D445	124.300		0.25	
311	D445	124.2		0.22	
318		-----		-----	
331	D7279	123.30		-0.06	
340	D445	123.91		0.13	
343	D445	124.39		0.28	
349	ISO3104	126.8	DG(0.05)	1.02	
353	IP71	123.21		-0.08	
360	D445	123.98		0.15	
398	D445	123.27		-0.06	
420	D7042	123.70		0.07	
432	D445	123.5		0.01	
450	D445	123.3		-0.06	
451	D7279	123.9		0.13	
473	D445	124.200		0.22	
496	D445	123.40		-0.02	
511	D445	124.34		0.26	
562	D445	123.4	C	-0.02	First reported 118.8
593	D445	122.12		-0.42	
609	D7042	124.51		0.32	
613	D445	121.2		-0.70	
614	D445	123.8		0.10	
657	D445	123.4		-0.02	
663		-----		-----	
840	D445	123.92		0.13	
862	D445	123.44		-0.01	
875		-----		-----	
902	D445	122.6		-0.27	
912	D445	122.2		-0.39	
963	D445	121.1		-0.73	
994	D445	125.42		0.59	
1013	D445	122.6		-0.27	
1017	D445	123.4425		-0.01	
1023	D445	123.5		0.01	
1059		-----		-----	
1080		-----		-----	
1094	D445	123.8723		0.12	
1106		-----		-----	
1128		-----		-----	
1146	D445	123.53		0.02	
1173	IP71	123.29		-0.06	
1203	D445	123.6		0.04	
1231		-----		-----	
1271	ISO3104	124.60		0.34	
1278		-----		-----	
1293	ISO3104	126.20	DG(0.05)	0.83	
1316	D445	123.9		0.13	
1358		-----		-----	
1402	D445	121.8		-0.51	
1406	D445	124.20		0.22	
1428	ISO3104	123.4		-0.02	
1431	D7042	123.7		0.07	
1526	D445	123.15		-0.10	
1613	D445	124.3		0.25	
1620	D445	123.2		-0.09	
1622	D445	124.69		0.37	
1648	D445	124.61		0.35	
1650	D445	122.57		-0.28	
1660		-----		-----	
1708	D445	123.72		0.07	
1720	D445	122.82		-0.20	
1730		-----		-----	
1800		-----		-----	
1827	D445	123.065		-0.13	
1833	D445	123.0		-0.15	
1850	ISO3104	123.5		0.01	
1900	D445	123.53		0.02	
1948	D445	123.61		0.04	

2122	In house	124.14	0.20
2133	D445	122.5	-0.30
2160		-----	-----

normality	not OK
n	59
outliers	2
mean (n)	123.481
st.dev. (n)	0.8673
R(calc.)	2.429
R(D445:11a)	9.145
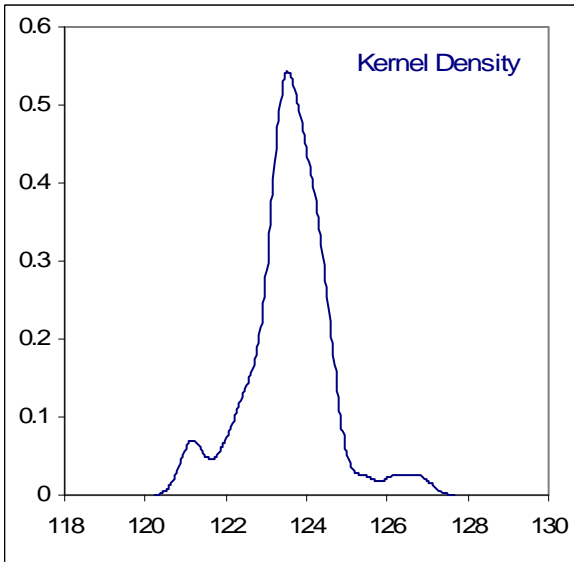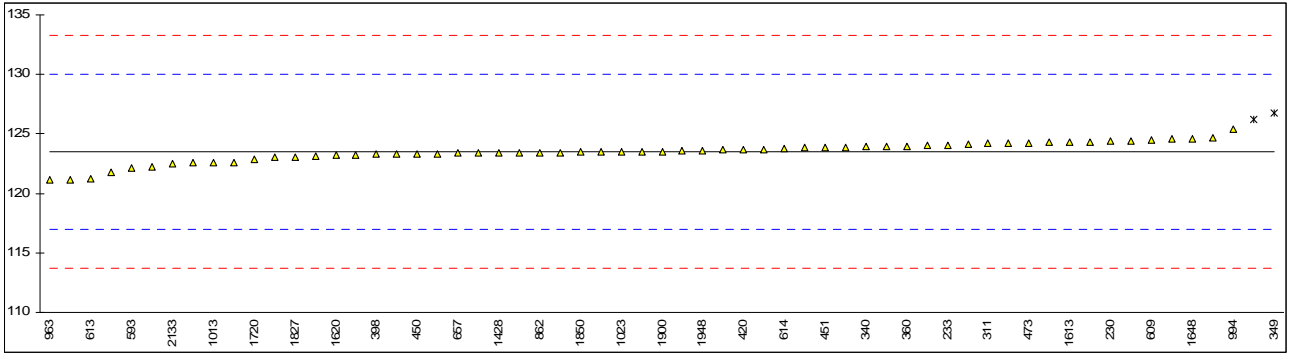
Determination of Kinematic Viscosity @ 100°C on sample #11042; results in mm^2/s

lab	method	value	mark	z(targ)	remarks
230	D445	13.689		0.60	
233	D7279	13.10	G(0.05)	-1.32	
237	D445	13.56		0.18	
252		-----		-----	
254		-----		-----	
255	D445	12.96	C,G(0.01)	-1.77	First reported 13.96
260	D445	13.7053		0.65	
311	D445	13.49		-0.05	
318		-----		-----	
331	D7279	13.56		0.18	
340	D445	13.422		-0.27	
343	D445	13.531		0.09	
349		-----		-----	
353		-----		-----	
360	D445	13.446		-0.19	
398	D445	13.506		0.01	
420	D7042	13.524		0.06	
432	D445	13.51		0.02	
450	D445	13.53		0.08	
451	D7279	13.54		0.12	
473	D445	13.592		0.29	
496	D445	13.476		-0.09	
511	D445	13.484		-0.07	
562	D445	13.45		-0.18	
593	D445	13.27		-0.76	
609	D7042	13.682		0.58	
613	D445	13.43		-0.24	
614		-----		-----	
657	D445	13.78		0.90	
663		-----		-----	
840	D445	13.462		-0.14	
862	D445	13.463		-0.13	
875	D445	13.45		-0.18	
902	D445	13.39		-0.37	
912	D445	13.79		0.93	
963	D445	13.41		-0.31	
994	D445	13.65		0.47	
1013	D445	13.38		-0.40	
1017	D445	13.5133		0.03	
1023	D445	13.44		-0.21	
1059	ISO3104	13.43		-0.24	
1080	D445	13.46		-0.14	
1094	D445	13.543		0.13	
1106		-----		-----	
1128		-----		-----	
1146	D445	13.489		-0.05	
1173		-----		-----	
1203	D445	13.22		-0.93	
1231		-----		-----	
1271	ISO3104	13.66		0.51	
1278		-----		-----	
1293	ISO3104	13.57		0.21	
1316	D445	13.50		-0.01	
1358	IP71	13.33		-0.57	
1402	D445	13.36		-0.47	
1406	D445	13.565		0.20	
1428	ISO3104	13.56		0.18	
1431	D7042	13.56		0.18	
1526		-----		-----	
1613	D445	13.63		0.41	
1620	D445	13.57		0.21	
1622	D445	13.47		-0.11	
1648	D445	13.229		-0.90	
1650	D445	13.660		0.51	
1660		-----		-----	
1708	D445	13.396		-0.35	
1720		-----		-----	
1730		-----		-----	
1800		-----		-----	
1827	D445	13.47		-0.11	
1833	D445	13.48		-0.08	
1850	ISO3104	13.41		-0.31	
1900	D445	13.45		-0.18	
1948	D445	13.55		0.15	

2122	In house	13.56	0.18
2133	D445	13.49	-0.05
2160		-----	-----

normality	OK	
n	57	
outliers	2	
mean (n)	13.5042	
st.dev. (n)	0.11624	
R(calc.)	0.3255	
R(D445:11a)	0.8602	
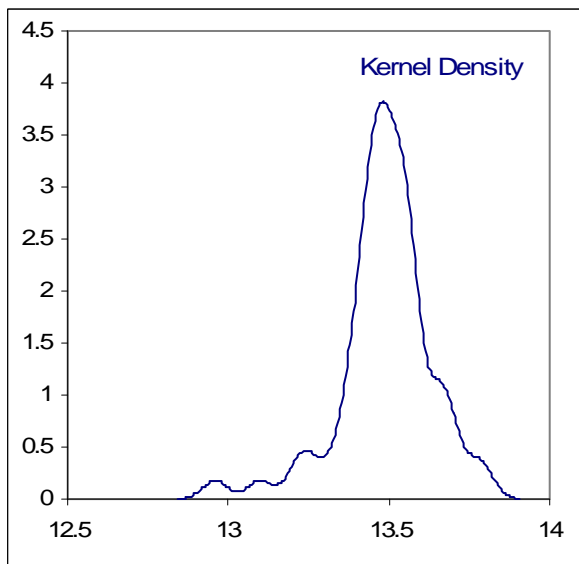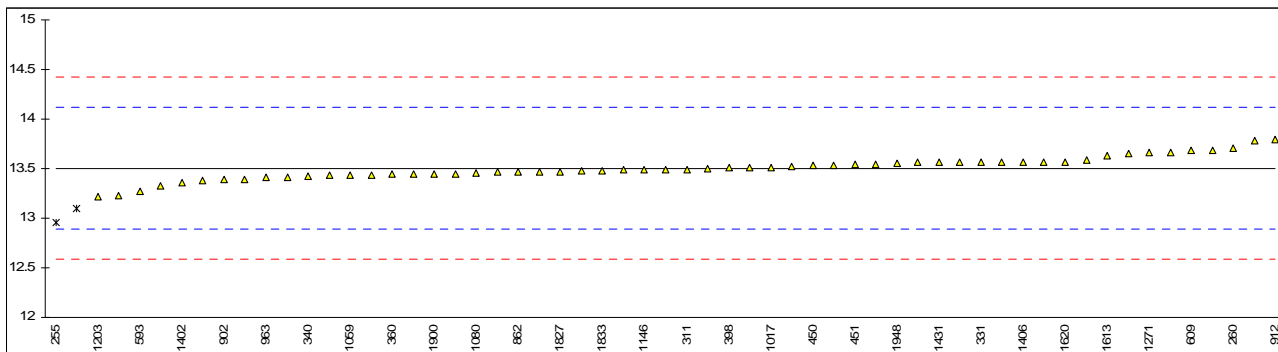
Determination of Water on sample #11042; results in mg/kg

lab	method	value	mark	z(targ)	remarks
230	D6304-C	385	C	-0.94	First reported 0.0385
233	D7358	0.00	ex	-2.23	Result excluded, see §4.1
237		-----		-----	
252	D95	<1000		-----	
254	D95	<500		-----	
255	D95	200	ex	-1.56	Result excluded, see §4.1
260	D95	NIL		-----	
311		-----		-----	
318	INH-III	1600	ex	3.14	Result excluded, see §4.1
331	D6304-C	725		0.20	
340	D6304-A	473	ex	-0.64	Result excluded, see §4.1
343		-----		-----	
349		-----		-----	
353		-----		-----	
360		-----		-----	
398	D6304-A	532	ex	-0.44	Result excluded, see §4.1
420		-----		-----	
432		-----		-----	
450		-----		-----	
451	D6304-C	404		-0.87	
473		-----		-----	
496	D6304-C	498.39		-0.56	
511	D6304-A	1075	C,ex	1.38	First reported 1530
562		-----		-----	
593		-----		-----	
609	D6304-A	658.9	ex	-0.02	Result excluded, see §4.1
613		-----		-----	
614	D6304-	658	ex	-0.02	Result excluded, see §4.1
657	D6304-A	1030	C,ex	1.23	First reported 2180, Result excluded, see §4.1
663		-----		-----	
840	D95	900	ex	0.79	Result excluded, see §4.1
862	D6304-C	956		0.98	
875		-----		-----	
902	D6304-A	2099.4	C,ex	4.82	First reported 1531.6, Result excluded, see §4.1
912		-----		-----	
963	D6304-	1780	ex	3.75	Result excluded, see §4.1
994		-----		-----	
1013		-----		-----	
1017	D6304-A	919.62	ex	0.86	Result excluded, see §4.1
1023	D6304-	790	ex	0.42	Result excluded, see §4.1
1059	In house	640	ex	-0.08	Result excluded, see §4.1
1080	D6304-C	890		0.76	
1094	D6304-A	1507	ex	2.83	Result excluded, see §4.1
1106		-----		-----	
1128		-----		-----	
1146	D6304-C	781		0.39	
1173	In house	853	ex	0.63	Result excluded, see §4.1
1203	D6304-	647	ex	-0.06	Result excluded, see §4.1
1231		-----		-----	
1271	ISO12937	598.0	ex	-0.22	Result excluded, see §4.1
1278		-----		-----	
1293	ISO12937	1990.2	C,ex	4.45	First reported 1920.15, Result excluded, see §4.1
1316	D6304-C	704		0.13	
1358	IP74	500	ex	-0.55	Result excluded, see §4.1
1402	D6304-mod	527	ex	-0.46	Result excluded, see §4.1
1406	D1744	570	ex	-0.32	Result excluded, see §4.1
1428	ISO12937	875	C,ex	0.71	First reported 1638, Result excluded, see §4.1
1431	D6304-A	1160	C,ex	1.67	First reported 1235, Result excluded, see §4.1
1526	D4377	<5000		-----	
1613		-----		-----	
1620	D6304-	741	ex	0.26	Result excluded, see §4.1
1622		-----		-----	
1648	D6304-	250	ex	-1.39	Result excluded, see §4.1
1650		-----		-----	
1660		-----		-----	
1708	D6304-A	340	ex	-1.09	Result excluded, see §4.1
1720		-----		-----	
1730		-----		-----	
1800		-----		-----	
1827	D6304-	958.4	ex	0.99	Result excluded, see §4.1
1833	D6304-A	1876	C,ex	4.07	First reported 1660, Result excluded, see §4.1
1850		-----		-----	
1900	D6304-C	737		0.25	
1948	ISO12937	1592	C,ex	3.12	First reported 1472.13, Result excluded, see §4.1

2122	IP396	800	ex	0.46	Result excluded, see §4.1
2133	D6304-C	560		-0.35	
2160		-----		-----	

normality	OK
n	10
outliers	0
mean (n)	664.0
st.dev. (n)	195.61
R(calc.)	547.7
R(D6304:07)	833.7
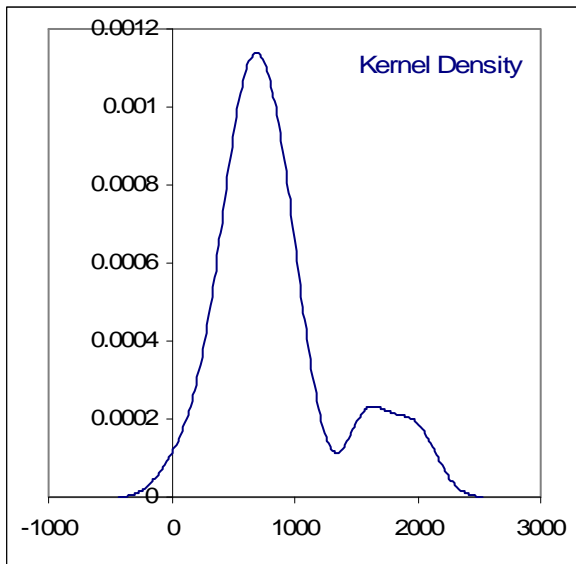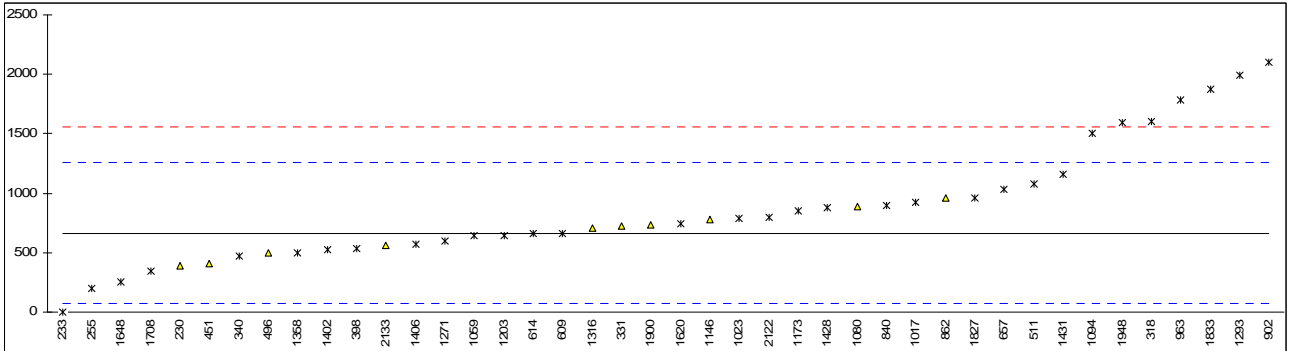
Determination of Aluminium (Al) on sample #11043; results in mg/kg

lab	method	value	mark	z(targ)	remarks
230	D6595	13.33		1.06	
233	D6595	11.481		0.33	
237		-----		-----	
252		-----		-----	
254		-----		-----	
255	In house	9.94		-0.29	
260	D5185	16.1		2.17	
311	D5185	11		0.14	
318		-----		-----	
331	D5185mod	12		0.53	
340	D5185	9		-0.66	
343	D5185	9.2		-0.58	
349	D5185	7.24		-1.36	
353		-----		-----	
360	D5185	10.7		0.02	
398	D6595	11.6		0.38	
420	In house	10.7		0.02	
432		-----		-----	
450		-----		-----	
451		-----		-----	
473	D5185	5.7136		-1.97	
496	D5185	8.3		-0.94	
511	D6595	14.05		1.35	
562	D6595	14.2	C	1.41	First reported 2.5
593		-----		-----	
609	D5185	9.992		-0.27	
613	D5185	11.2		0.22	
614	D5185	10.7		0.02	
657	D5185	14		1.33	
663	D5185	9.44		-0.49	
840		-----		-----	
862		-----		-----	
875		-----		-----	
902	D5185	7.13	ex	-1.41	Result excluded, see §4
912	D5185	13		0.93	
963		-----		-----	
994	D5185	11.41		0.30	
1013		-----		-----	
1017		-----		-----	
1023	D5185	10.1		-0.22	
1059	In house	10		-0.26	
1080	D5185	7.1		-1.42	
1094	D5185	9.8		-0.34	
1106		-----		-----	
1128	In house	7.0	C	-1.46	First reported 65.45
1146	D5185	8.69		-0.78	
1173		-----		-----	
1203	D5185	9		-0.66	
1231		-----		-----	
1271	D5863	15.677	C	2.00	First reported 19.945
1278	D5185	8.84		-0.72	
1293	D6595	15.230		1.82	
1316	D5185	12.2		0.61	
1358		-----		-----	
1402	D5185	2.4	G(0.05)	-3.29	
1406		-----		-----	
1428	D5185	10.5		-0.06	
1431	In house	12.0		0.53	
1526		-----		-----	
1613		-----		-----	
1620	D5185	10		-0.26	
1622	D5185	11.23		0.23	
1648	D5185	9.467		-0.47	
1650		-----		-----	
1660		-----		-----	
1708	D5185	12.3		0.65	
1720		-----		-----	
1730	D5185	9.539		-0.45	
1800	In house	10.1		-0.22	
1827		-----		-----	
1833		-----		-----	
1850		-----		-----	
1900	D6595	13.70		1.21	
1948	D5185	8.40		-0.90	

2122	D5185	10.6	-0.02
2133	D5185	4.503	-2.45
2160		-----	-----

normality	OK	
n	46	
outliers	1	
mean (n)	10.66	
st.dev. (n)	2.482	
R(calc.)	6.95	
R(D5185:09)	7.03	
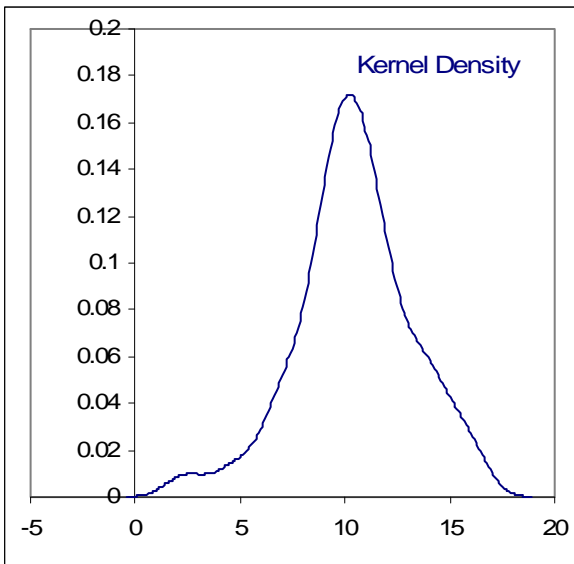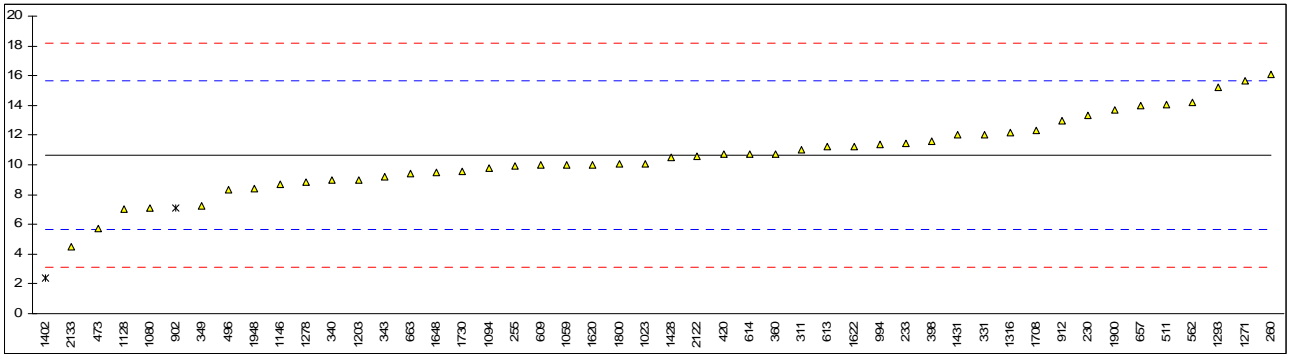
Determination of Barium (Ba) on sample #11043; results in mg/kg

lab	method	value	mark	z(targ)	remarks
230	D6595	25.63		0.48	
233	D6595	7.653	G(0.05)	-4.14	
237		-----		-----	
252		-----		-----	
254		-----		-----	
255		-----		-----	
260		-----		-----	
311	D5185	27		0.83	
318		-----		-----	
331	D5185mod	23		-0.19	
340	D5185	23		-0.19	
343	D5185	18.9		-1.25	
349	D5185	24.77		0.26	
353		-----		-----	
360	D5185	22.0		-0.45	
398	D6595	28.2		1.14	
420		-----		-----	
432		-----		-----	
450		-----		-----	
451		-----		-----	
473	D5185	20.3510		-0.88	
496	D5185	22.3		-0.37	
511	D6595	31.32	C	1.95	First reported 33.36
562	D6595	44.3	C,G(0.01)	5.29	First reported 0.8
593		-----		-----	
609	D5185	21.52		-0.58	
613	D5185	23.4		-0.09	
614	D5185	22.9		-0.22	
657	D5185	21.1	C	-0.68	First reported 8
663	D5185	21.60		-0.56	
840		-----		-----	
862		-----		-----	
875		-----		-----	
902	D5185	13.26	G(0.05)	-2.70	
912	D5185	24		0.06	
963		-----		-----	
994	D5185	21.52		-0.58	
1013		-----		-----	
1017		-----		-----	
1023	D5185	21.7		-0.53	
1059		-----		-----	
1080	D5185	14	G(0.05)	-2.51	
1094	D5185	24.2		0.11	
1106		-----		-----	
1128	In house	28.35		1.18	
1146	D5185	21.94		-0.47	
1173		-----		-----	
1203	D5185	20		-0.97	
1231		-----		-----	
1271		-----		-----	
1278	D5185	21.75		-0.52	
1293	D6595	29.809		1.56	
1316	D5185	24.7		0.24	
1358		-----		-----	
1402	D5185	<1		<-5.86	False negative?
1406		-----		-----	
1428	D5185	22.0		-0.45	
1431	In house	25.8		0.53	
1526		-----		-----	
1613		-----		-----	
1620	D5185	24		0.06	
1622	D5185	30.90		1.84	
1648		-----		-----	
1650		-----		-----	
1660		-----		-----	
1708	D5185	24.4		0.17	
1720		-----		-----	
1730	D5185	19.489		-1.10	
1800	In house	23.5		-0.07	
1827		-----		-----	
1833		-----		-----	
1850	In house	28		1.09	
1900	D6595	27.78		1.04	
1948	D5185	18.78		-1.28	

2122	D5185	23.6	-0.04
2133		-----	-----
2160	In house	19.55	-1.08

normality	OK	
n	38	
outliers	4	
mean (n)	23.76	
st.dev. (n)	3.265	
R(calc.)	9.14	
R(D5185:09)	10.88	Application range: 0.5 – 4 mg/kg
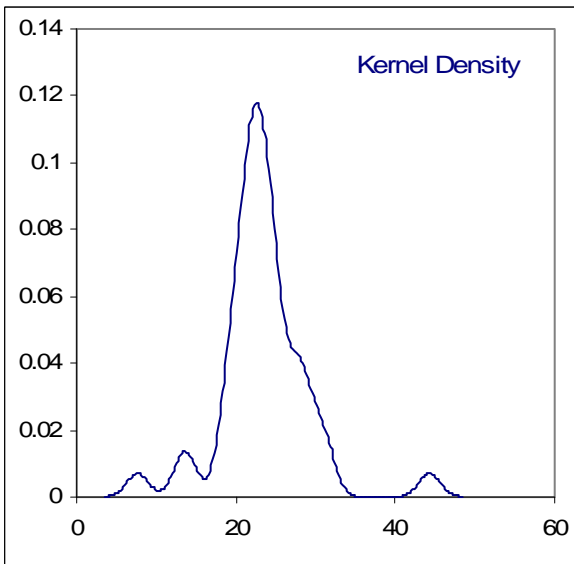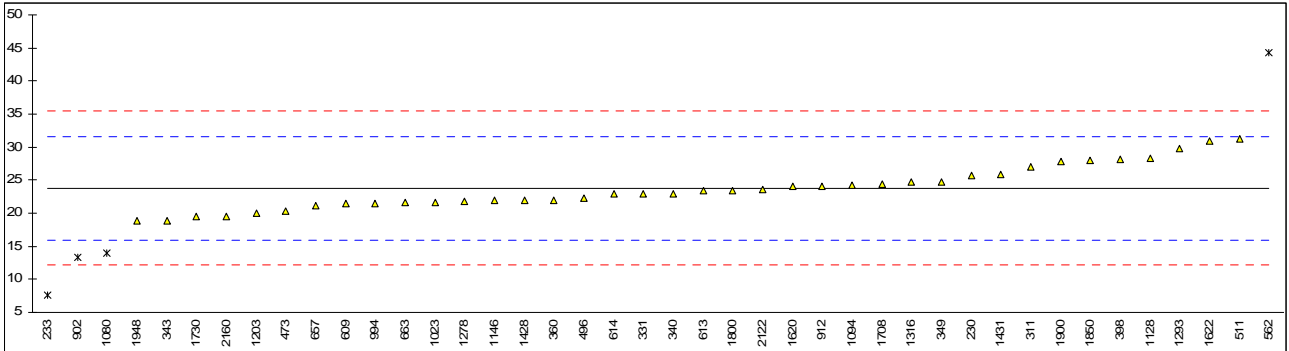
Determination of Chromium (Cr) on sample #11043; results in mg/kg

lab	method	value	mark	z(targ)	remarks
230	D6595	11.23		2.29	
233	D6595	11.137		2.21	
237		-----		-----	
252		-----		-----	
254		-----		-----	
255	In house	9.23		0.45	
260	D5185	7.48		-1.16	
311	D5185	10		1.16	
318	INH-2I	9.0		0.24	
331	D5185mod	9		0.24	
340	D5185	8		-0.68	
343	D5185	8.4		-0.31	
349	D5185	9.3		0.52	
353		-----		-----	
360	D5185	7.0		-1.60	
398	D6595	12.3		3.28	
420		-----		-----	
432		-----		-----	
450		-----		-----	
451		-----		-----	
473	D5185	7.1118		-1.50	
496	D5185	7.7		-0.96	
511	D6595	14.01	C	4.85	First reported 14.54
562	D6595	12.7	C	3.65	First reported 0.9
593		-----		-----	
609	D5185	7.286		-1.34	
613	D5185	9.0		0.24	
614	D5185	8.37		-0.34	
657	D5185	8		-0.68	
663	D5185	7.96		-0.72	
840		-----		-----	
862		-----		-----	
875		-----		-----	
902	D5185	4.59	ex	-3.82	Result excluded, see §4
912	D5185	9.0		0.24	
963		-----		-----	
994	D5185	11.71		2.74	
1013		-----		-----	
1017		-----		-----	
1023	D5185	8.36		-0.35	
1059	In house	9		0.24	
1080	D5185	5.0		-3.45	
1094	D5185	8.1		-0.59	
1106		-----		-----	
1128	In house	8.55		-0.18	
1146	D5185	7.77		-0.89	
1173		-----		-----	
1203	D5185	7		-1.60	
1231		-----		-----	
1271	D5863	7.445		-1.19	
1278	D5185	7.80		-0.87	
1293	D6595	11.384		2.44	
1316	D5185	9.07		0.30	
1358	IP593	6.5		-2.06	
1402	D5185	0.8	G(0.01)	-7.31	
1406	D4628	9.9		1.07	
1428	D5185	8.0		-0.68	
1431	In house	8.0		-0.68	
1526	D5185	7.8		-0.87	
1613		-----		-----	
1620	D5185	9		0.24	
1622	D5185	7.93		-0.75	
1648	D5185	9.662		0.85	
1650		-----		-----	
1660		-----		-----	
1708	D5185	8.5		-0.22	
1720		-----		-----	
1730	D5185	7.410		-1.23	
1800	In house	8.7		-0.04	
1827		-----		-----	
1833		-----		-----	
1850	In house	7		-1.60	
1900	D6595	12.17		3.16	
1948	D5185	7.14		-1.47	

2122	D5185	8.9	0.15
2133	D5185	6.504	-2.06
2160	In house	8.23	-0.47

normality	not OK
n	51
outliers	1
mean (n)	8.74
st.dev. (n)	1.757
R(calc.)	4.92
R(D5185:09)	3.04
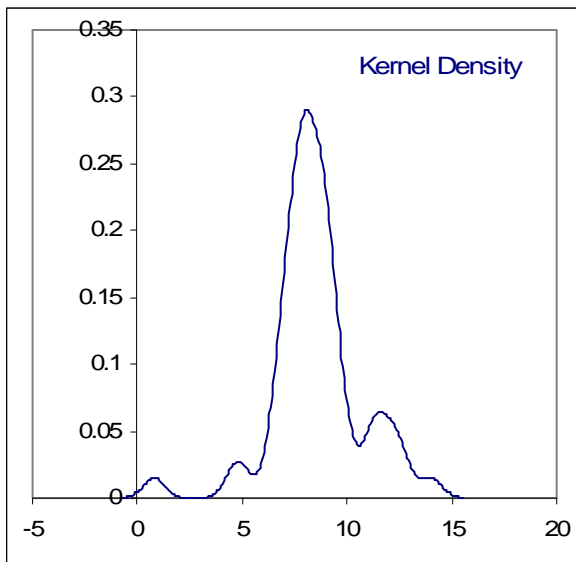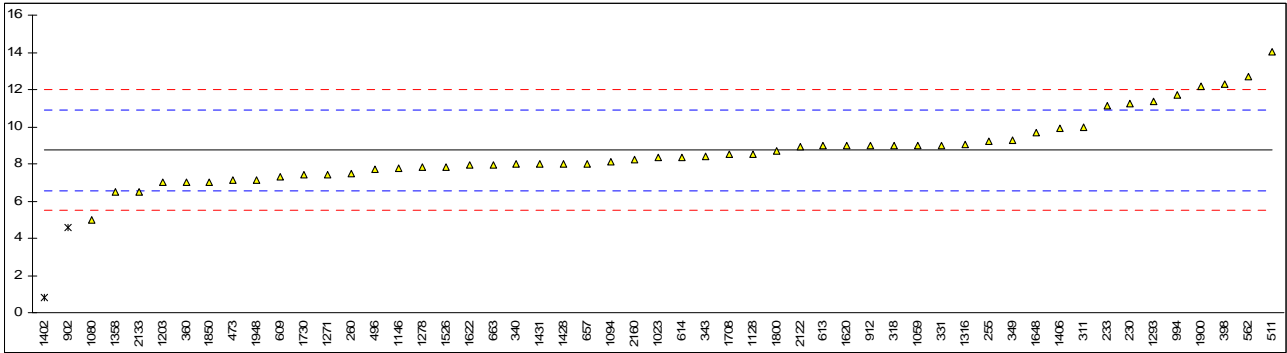
Determination of Copper (Cu) on sample #11043; results in mg/kg

lab	method	value	mark	z(targ)	remarks
230	D6595	25.31		2.58	
233	D6595	24.874		2.33	
237		-----		-----	
252		-----		-----	
254		-----		-----	
255	In house	18.94		-1.01	
260	D5185	13.52		-4.06	
311	D5185	25		2.40	
318	INH-2I	22		0.71	
331	D5185mod	20		-0.41	
340	D5185	19		-0.97	
343	D5185	19.3		-0.81	
349	D5185	21.53		0.45	
353		-----		-----	
360	D5185	19.1		-0.92	
398	D6595	29.1		4.71	
420	DIN51404	17.9		-1.59	
432		-----		-----	
450		-----		-----	
451		-----		-----	
473	D5185	20.6609		-0.04	
496	D5185	20.5		-0.13	
511		-----		-----	
562	D6595	25.5	C	2.68	First reported 8.2
593		-----		-----	
609	D5185	20.94		0.12	
613	D5185	21.4		0.38	
614	D5185	21.1		0.21	
657	D5185	20		-0.41	
663	D5185	19.41		-0.74	
840		-----		-----	
862		-----		-----	
875		-----		-----	
902	D5185	14.47	ex	-3.52	Result excluded, see §4
912	D5185	21		0.15	
963		-----		-----	
994	D5185	24.83		2.31	
1013		-----		-----	
1017		-----		-----	
1023	D5185	20.6		-0.07	
1059	In house	19		-0.97	
1080	D5185	15		-3.23	
1094	D5185	19.5		-0.69	
1106		-----		-----	
1128	In house	21.85		0.63	
1146	D5185	20.33		-0.23	
1173		-----		-----	
1203	D5185	19		-0.97	
1231		-----		-----	
1271	D5863	20.56		-0.10	
1278	D5185	19.2		-0.86	
1293	D6595	24.302		2.01	
1316	D5185	21.9		0.66	
1358		-----		-----	
1402	D5185	5.0	G(0.01)	-8.85	
1406	D4628	20.5		-0.13	
1428	D5185	19.6		-0.64	
1431	In house	20.2		-0.30	
1526	D5185	20		-0.41	
1613		-----		-----	
1620	D5185	22		0.71	
1622	D5185	22.76		1.14	
1648	D5185	20.61		-0.07	
1650		-----		-----	
1660		-----		-----	
1708	D5185	20.2		-0.30	
1720		-----		-----	
1730	D5185	18.097		-1.48	
1800	In house	20.4		-0.19	
1827		-----		-----	
1833		-----		-----	
1850	In house	14		-3.79	
1900	D6595	27.29		3.69	
1948	D5185	16.55		-2.35	

2122	D5185	21.7	0.55
2133	D5185	18.563	-1.22
2160	In house	21.95	0.69

normality	not OK
n	50
outliers	1
mean (n)	20.73
st.dev. (n)	2.959
R(calc.)	8.29
R(D5185:09)	4.98
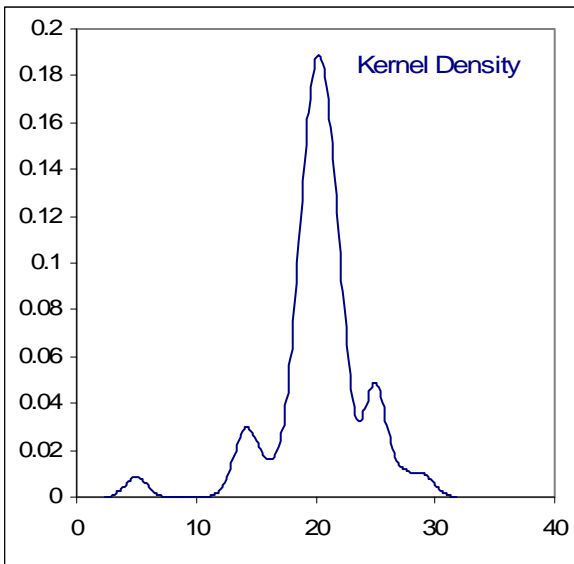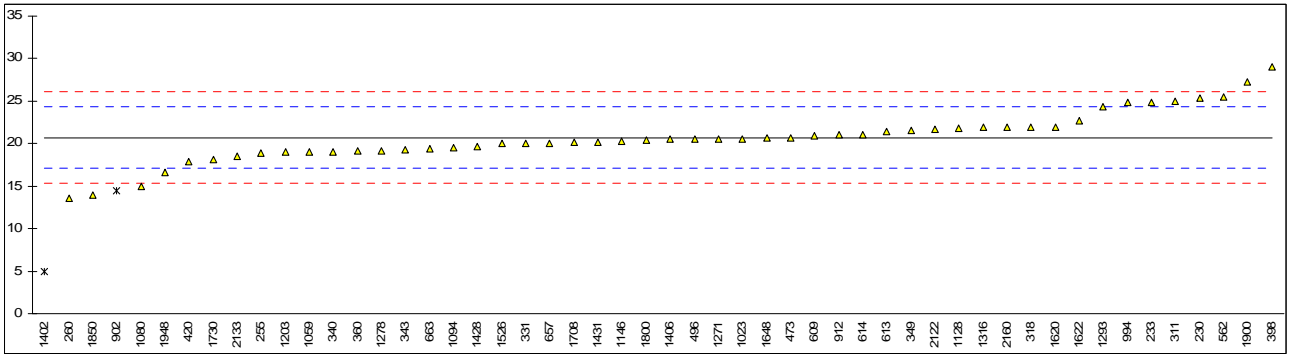
Determination of Iron (Fe) on sample #11043; results in mg/kg

lab	method	value	mark	z(targ)	remarks
230	D6595	17.98		1.74	
233	D6595	16.116		0.60	
237		-----		-----	
252		-----		-----	
254		-----		-----	
255	In house	14.59		-0.33	
260	D5185	12.28		-1.75	
311	D5185	17		1.14	
318		-----		-----	
331	D5185mod	15		-0.08	
340	D5185	15		-0.08	
343	D5185	15.4		0.16	
349	D5185	15.37		0.14	
353		-----		-----	
360	D5185	14.7		-0.27	
398	D6595	15.3		0.10	
420	DIN51404	14.7		-0.27	
432		-----		-----	
450		-----		-----	
451		-----		-----	
473	D5185	12.5048		-1.61	
496	D5185	13.8		-0.82	
511	D6595	16.42		0.79	
562	D6595	24.4	C,G(0.01)	5.67	First reported 12.9
593		-----		-----	
609	D5185	16.50		0.84	
613	D5185	17.2		1.26	
614	D5185	16.1		0.59	
657	D5185	14		-0.70	
663	D5185	13.84		-0.79	
840		-----		-----	
862		-----		-----	
875		-----		-----	
902	D5185	7.8	C,DG(0.01)	-4.49	First reported 8.57
912	D5185	15		-0.08	
963		-----		-----	
994	D5185	14.92		-0.13	
1013		-----		-----	
1017		-----		-----	
1023	D5185	14.9		-0.14	
1059	In house	15		-0.08	
1080		-----		-----	
1094	D5185	14.6		-0.33	
1106		-----		-----	
1128	In house	16.05		0.56	
1146	D5185	14.16		-0.60	
1173		-----		-----	
1203	D5185	13		-1.31	
1231		-----		-----	
1271	D5863	19.165		2.47	
1278	D5185	14.635		-0.31	
1293	D6595	17.007		1.15	
1316	D5185	16.2		0.65	
1358	IP593	7.5	DG(0.01)	-4.68	
1402	D5185	8.0	G(0.01)	-4.37	
1406	D4628	15.6		0.28	
1428	D5185	14.1		-0.63	
1431	In house	14.6		-0.33	
1526		-----		-----	
1613		-----		-----	
1620	D5185	16		0.53	
1622	D5185	14.18		-0.59	
1648	D5185	16.04		0.55	
1650		-----		-----	
1660		-----		-----	
1708	D5185	16.0		0.53	
1720		-----		-----	
1730	D5185	14.320		-0.50	
1800	In house	15.7		0.35	
1827		-----		-----	
1833		-----		-----	
1850	In house	14		-0.70	
1900	D6595	18.19		1.87	
1948	D5185	12.82		-1.42	

2122	D5185	15.6	0.28
2133	D5185	10.671	-2.74
2160		-----	-----

normality	OK
n	46
outliers	4
mean (n)	15.14
st.dev. (n)	1.576
R(calc.)	4.41
R(D5185:09)	4.57
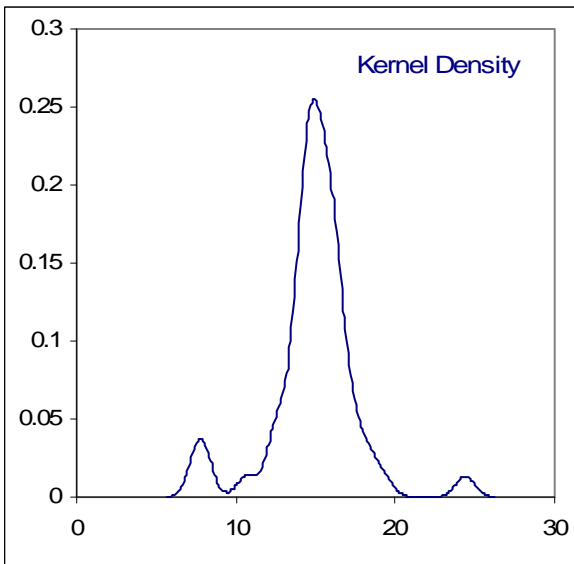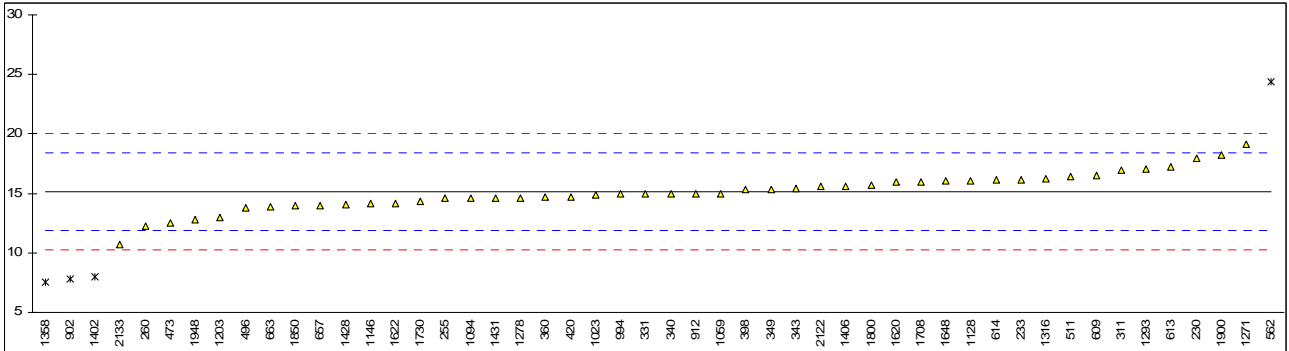
Determination of Lead (Pb) on sample #11043; results in mg/kg

lab	method	value	mark	z(targ)	remarks
230	D6595	11.69		1.36	
233	D6595	10.085		0.66	
237		-----		-----	
252		-----		-----	
254		-----		-----	
255	In house	9.57		0.44	
260	D5185	9.6		0.45	
311	D5185	10		0.63	
318	INH-2I	8.1		-0.19	
331	D5185mod	9		0.20	
340	D5185	8		-0.24	
343	D5185	7.2		-0.58	
349	D5185	8.73		0.08	
353		-----		-----	
360	D5185	6.8		-0.75	
398	D6595	10.7		0.93	
420		-----		-----	
432		-----		-----	
450		-----		-----	
451		-----		-----	
473	D5185	7.2595		-0.55	
496	D5185	6.9		-0.71	
511	D6595	10.56		0.87	
562	D6595	9.2	C	0.28	First reported 5.1
593		-----		-----	
609	D5185	6.693		-0.80	
613	D5185	8.3		-0.11	
614	D5185	8.0		-0.24	
657	D5185	8		-0.24	
663	D5185	7.35		-0.52	
840		-----		-----	
862		-----		-----	
875		-----		-----	
902	D5185	4.99	ex	-1.53	Result excluded, see §4
912	D5185	8.9		0.15	
963		-----		-----	
994	D5185	10.09		0.67	
1013		-----		-----	
1017		-----		-----	
1023	D5185	8.32		-0.10	
1059	In house	9		0.20	
1080	D5185	9.7		0.50	
1094	D5185	7.7		-0.37	
1106		-----		-----	
1128	In house	8.70		0.07	
1146	D5185	8.04		-0.22	
1173		-----		-----	
1203	D5185	8		-0.24	
1231		-----		-----	
1271	D5863	5.4906	C	-1.32	First reported 4.310
1278	D5185	7.20		-0.58	
1293	D6595	11.039		1.07	
1316	D5185	9.76		0.52	
1358	IP593	7.2		-0.58	
1402	D5185	4.0	ex	-1.96	Result excluded, see §4
1406	D4628	10.1		0.67	
1428	D5185	7.6		-0.41	
1431	In house	8.4		-0.06	
1526	D5185	<10		-----	
1613		-----		-----	
1620	D5185	9		0.20	
1622	D5185	8.94		0.17	
1648	D5185	12.21		1.58	
1650		-----		-----	
1660		-----		-----	
1708	D5185	7.8		-0.32	
1720		-----		-----	
1730	D5185	7.662		-0.38	
1800	In house	7.7		-0.37	
1827		-----		-----	
1833		-----		-----	
1850	In house	7		-0.67	
1900	D6595	10.496		0.84	
1948	D5185	5.95		-1.12	

2122	D5185	7.5	-0.45
2133	D5185	7.570	-0.42
2160	In house	8.53	-0.01

normality	OK
n	50
outliers	0
mean (n)	8.55
st.dev. (n)	1.438
R(calc.)	4.03
R(D5185:09)	6.49
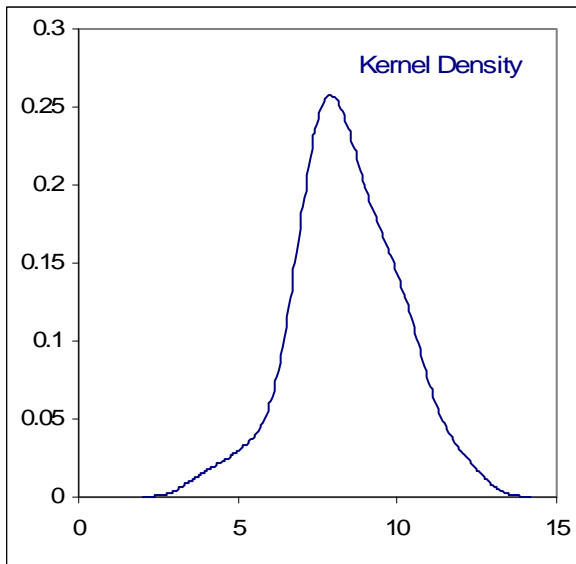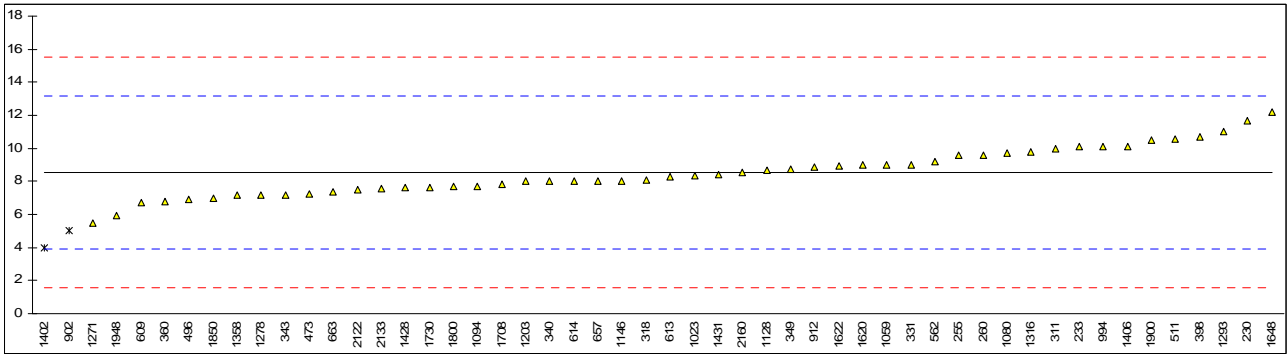
Determination of Lithium (Li) on sample #11043; results in mg/kg

lab	method	value	mark	z(targ)	remarks
230	D6595	47.48	G(0.01)	8.93	
233	D6595	33.451		3.29	
237		-----		-----	
252		-----		-----	
254		-----		-----	
255		-----		-----	
260		-----		-----	
311		-----		-----	
318		-----		-----	
331		-----		-----	
340		-----		-----	
343	INH1180	20.6		-1.88	
349		-----		-----	
353		-----		-----	
360		-----		-----	
398		-----		-----	
420		-----		-----	
432		-----		-----	
450		-----		-----	
451		-----		-----	
473		-----		-----	
496	D5185	25.7		0.17	
511		-----		-----	
562		-----		-----	
593		-----		-----	
609		-----		-----	
613	D5185	23.8		-0.59	
614	D5185	25.0		-0.11	
657		-----		-----	
663		-----		-----	
840		-----		-----	
862		-----		-----	
875		-----		-----	
902		-----		-----	
912		-----		-----	
963		-----		-----	
994		-----		-----	
1013		-----		-----	
1017		-----		-----	
1023	D5185	24.8		-0.19	
1059		-----		-----	
1080		-----		-----	
1094		-----		-----	
1106		-----		-----	
1128	In house	n.d.		-----	False negative?
1146	D5185	22.64		-1.06	
1173		-----		-----	
1203	D5185	22		-1.32	
1231		-----		-----	
1271		-----		-----	
1278		-----		-----	
1293		-----		-----	
1316		-----		-----	
1358		-----		-----	
1402		-----		-----	
1406		-----		-----	
1428	D5185	25.0		-0.11	
1431	In house	29.0		1.50	
1526		-----		-----	
1613		-----		-----	
1620	D5185	26		0.29	
1622		-----		-----	
1648		-----		-----	
1650		-----		-----	
1660		-----		-----	
1708		-----		-----	
1720		-----		-----	
1730		-----		-----	
1800		-----		-----	
1827		-----		-----	
1833		-----		-----	
1850		-----		-----	
1900		-----		-----	
1948		-----		-----	

2122	-----	-----
2133	-----	-----
2160	-----	-----

normality	OK
n	11
outliers	1
mean (n)	25.27
st.dev. (n)	3.514
R(calc.)	9.84
R(Horwitz)	6.96
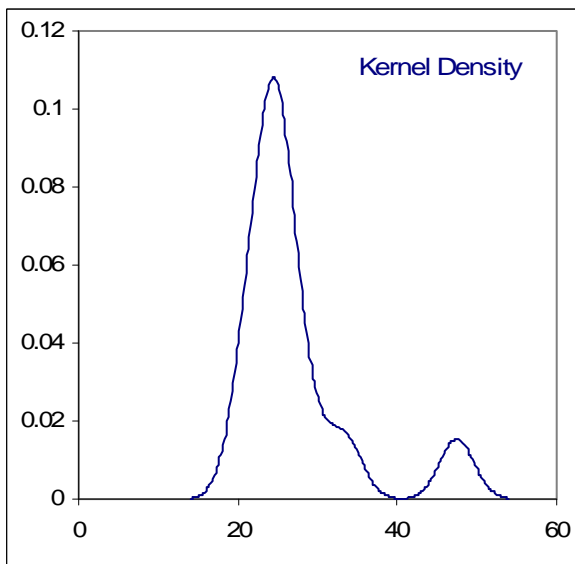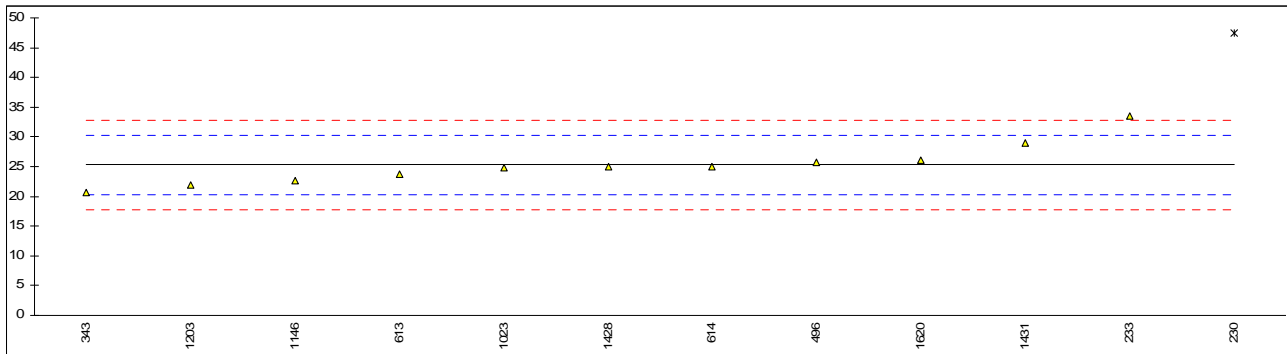
Determination of Magnesium (Mg) on sample #11043; results in mg/kg

lab	method	value	mark	z(targ)	remarks
230	D6595	32.45		2.01	
233	D6595	29.086		0.95	
237		-----		-----	
252		-----		-----	
254		-----		-----	
255	In house	15.58		-3.32	
260		-----		-----	
311	D5185	29		0.92	
318	INH-2I	10	G(0.05)	-5.08	
331	D5185mod	26		-0.03	
340	D5185	25		-0.34	
343	D5185	27		0.29	
349	D5185	27.00		0.29	
353		-----		-----	
360	D5185	28.5		0.76	
398	D6595	30.1		1.27	
420		-----		-----	
432		-----		-----	
450		-----		-----	
451		-----		-----	
473	D5185	26.8245		0.23	
496	D5185	23.3		-0.88	
511		-----		-----	
562	D6595	33.3	C	2.28	First reported 19.2
593		-----		-----	
609	D5185	25.70		-0.12	
613	D5185	26.7		0.19	
614	D5185	26.0		-0.03	
657	D5185	24		-0.66	
663	D5185	24.60		-0.47	
840	UOP389	23.84		-0.71	
862		-----		-----	
875		-----		-----	
902	D5185	22.31	ex	-1.19	Result excluded, see §4
912	D5185	25.5		-0.18	
963		-----		-----	
994	D5185	22.81		-1.03	
1013		-----		-----	
1017		-----		-----	
1023	D5185	27.2		0.35	
1059	In house	<50		-----	
1080	D5185	18		-2.55	
1094	D5185	24.7		-0.44	
1106		-----		-----	
1128	In house	24.5	C	-0.50	First reported 98.5
1146	D5185	24.43		-0.52	
1173		-----		-----	
1203	D5185	28		0.61	
1231		-----		-----	
1271	D5863	26.08		0.00	
1278	D5185	25.9		-0.06	
1293	D6595	32.601		2.06	
1316	D5185	27.9		0.57	
1358		-----		-----	
1402	D5185	36	ex	3.13	Result excluded, see §4
1406	D4628	25.0		-0.34	
1428	D5185	26.3		0.07	
1431	In house	26.3		0.07	
1526		-----		-----	
1613		-----		-----	
1620	D5185	27		0.29	
1622	D5185	27.63		0.49	
1648	D5185	54.88	G(0.01)	9.09	
1650		-----		-----	
1660		-----		-----	
1708	D5185	26.8		0.23	
1720		-----		-----	
1730	D5185	23.845		-0.71	
1800	In house	26.9		0.26	
1827		-----		-----	
1833		-----		-----	
1850		-----		-----	
1900	D6595	36.55		3.30	
1948	D5185	21.92		-1.31	

2122	D5185	24.3	-0.56
2133	D5185	17.409	-2.74
2160		-----	-----

normality	not OK
n	43
outliers	2
mean (n)	26.08
st.dev. (n)	3.830
R(calc.)	10.72
R(D5185:09)	8.87

Kernel Density
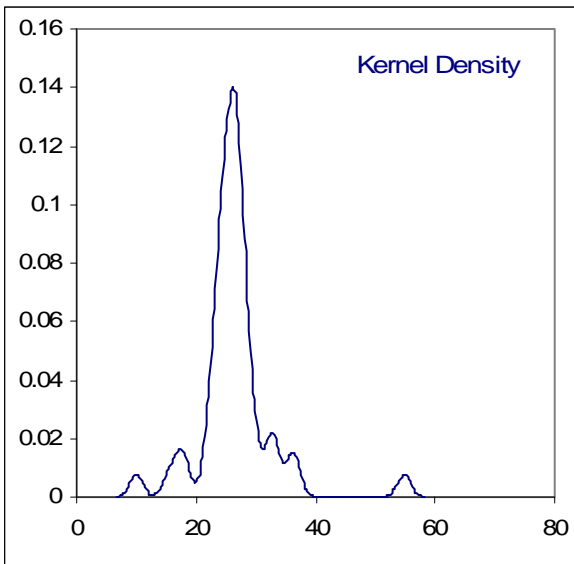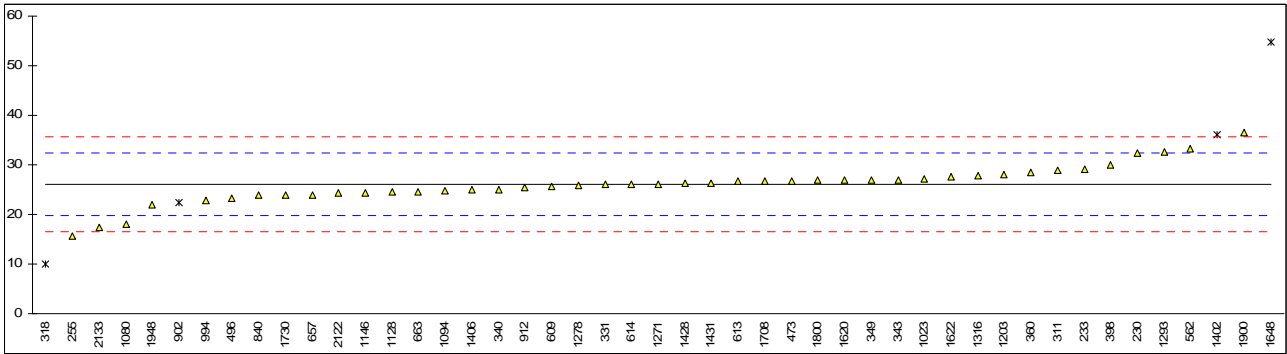
Determination of Manganese (Mn) on sample #11043; results in mg/kg

lab	method	value	mark	z(targ)	remarks
230	D6595	11.96		4.80	
233	D6595	11.831		4.60	
237		-----		-----	
252		-----		-----	
254		-----		-----	
255	In house	8.77		-0.19	
260		-----		-----	
311	D5185	10		1.73	
318		-----		-----	
331	D5185mod	9		0.17	
340		-----		-----	
343	D5185	8.6		-0.46	
349	D5185	10.13		1.94	
353		-----		-----	
360	D5185	7.6		-2.02	
398	D6595	9.6		1.11	
420		-----		-----	
432		-----		-----	
450		-----		-----	
451		-----		-----	
473	D5185	7.1560		-2.72	
496	D5185	8.1		-1.24	
511	D6595	13.21		6.75	
562		-----		-----	
593		-----		-----	
609	D5185	7.247		-2.58	
613	D5185	9.2		0.48	
614	D5185	8.4		-0.77	
657	D5185	9		0.17	
663	D5185	7.84		-1.65	
840		-----		-----	
862		-----		-----	
875		-----		-----	
902	D5185	5.17	ex	-5.82	Result excluded, see §4
912	D5185	9.0		0.17	
963		-----		-----	
994	D5185	8.11		-1.23	
1013		-----		-----	
1017		-----		-----	
1023	D5185	8.39		-0.79	
1059	In house	10		1.73	
1080	D5185	5.9		-4.68	
1094	D5185	8.1		-1.24	
1106		-----		-----	
1128	In house	9.5	C	0.95	First reported 52.8
1146	D5185	8.44		-0.71	
1173		-----		-----	
1203	D5185	8		-1.40	
1231		-----		-----	
1271	In house	4.00	G(0.05)	-7.65	
1278	D5185	7.89		-1.57	
1293	D6595	12.603		5.80	
1316	D5185	9.40		0.79	
1358	IP593	7.2		-2.65	
1402	D5185	<1		<-12.34	False negative?
1406	D4628	8.9		0.01	
1428	D5185	7.9		-1.55	
1431	In house	10.4		2.36	
1526		-----		-----	
1613		-----		-----	
1620	D5185	9		0.17	
1622		-----		-----	
1648		-----		-----	
1650		-----		-----	
1660		-----		-----	
1708	D5185	8.6		-0.46	
1720		-----		-----	
1730	D5185	7.560		-2.09	
1800	In house	9.1		0.32	
1827		-----		-----	
1833		-----		-----	
1850	In house	7		-2.96	
1900		-----		-----	
1948	D5185	7.45		-2.26	

2122	D5185	9.0	0.17
2133		-----	-----
2160	In house	9.53	1.00

normality	OK
n	41
outliers	1
mean (n)	8.89
st.dev. (n)	1.514
R(calc.)	4.24
R(D5185:09)	1.79
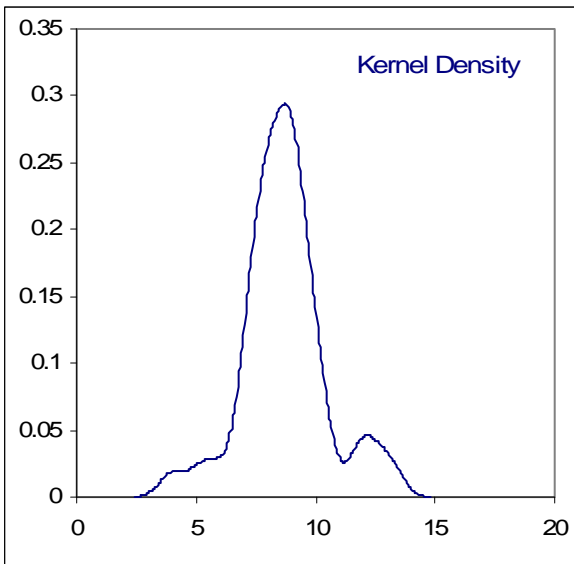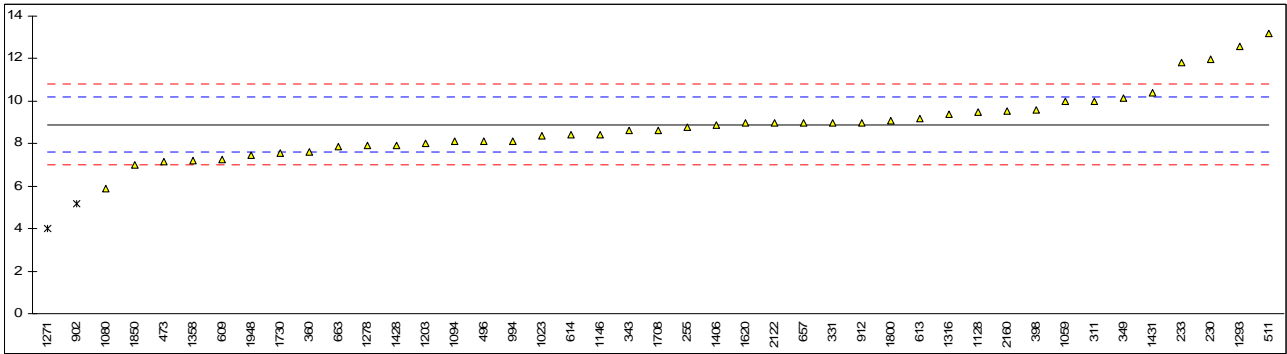
Determination of Molybdenum (Mo) on sample #11043; results in mg/kg

lab	method	value	mark	z(targ)	remarks
230	D6595	7.88		0.23	
233	D6595	6.790		-0.90	
237		-----		-----	
252		-----		-----	
254		-----		-----	
255		-----		-----	
260		-----		-----	
311	D5185	<10		-----	
318		-----		-----	
331	D5185mod	9		1.38	
340	D5185	7		-0.68	
343	D5185	7.3		-0.37	
349	D5185	9.22		1.61	
353		-----		-----	
360	D5185	5.7		-2.02	
398		-----		-----	
420		-----		-----	
432		-----		-----	
450		-----		-----	
451		-----		-----	
473	D5185	6.4228		-1.27	
496	D5185	7.4		-0.27	
511		-----		-----	
562	D6595	6.4	C	-1.30	First reported 0.1
593		-----		-----	
609	D5185	6.998		-0.68	
613	D5185	8.9		1.28	
614	D5185	8.07		0.42	
657	D5185	8		0.35	
663	D5185	7.56		-0.10	
840		-----		-----	
862		-----		-----	
875		-----		-----	
902	D5185	4.83	ex	-2.92	Result excluded, see §4
912	D5185	8.6		0.97	
963		-----		-----	
994	D5185	7.96		0.31	
1013		-----		-----	
1017		-----		-----	
1023	D5185	8.14		0.50	
1059	In house	9		1.38	
1080	D5185	5.1		-2.64	
1094	D5185	7.9		0.25	
1106		-----		-----	
1128	In house	8.5		0.87	
1146		-----		-----	
1173		-----		-----	
1203	D5185	7		-0.68	
1231		-----		-----	
1271	In house	7.00		-0.68	
1278	D5185	7.89		0.24	
1293	D6595	6.461		-1.23	
1316	D5185	9.03		1.41	
1358		-----		-----	
1402	D5185	1.0	G(0.01)	-6.86	
1406		-----		-----	
1428	D5185	7.8		0.15	
1431	In house	8.7		1.07	
1526		-----		-----	
1613		-----		-----	
1620	D5185	8		0.35	
1622		-----		-----	
1648		-----		-----	
1650		-----		-----	
1660		-----		-----	
1708	D5185	8.3		0.66	
1720		-----		-----	
1730	D5185	7.404		-0.26	
1800	In house	10.8	G(0.01)	3.24	
1827		-----		-----	
1833		-----		-----	
1850	In house	8		0.35	
1900	D6595	6.02		-1.69	
1948	D5185	6.93		-0.75	

2122	D5185	8.8		1.18
2133	D5185	11.266	G(0.01)	3.72
2160	In house	8.18		0.54

normality	OK
n	37
outliers	3
mean (n)	7.66
st.dev. (n)	1.001
R(calc.)	2.80
R(D5185:09)	2.72
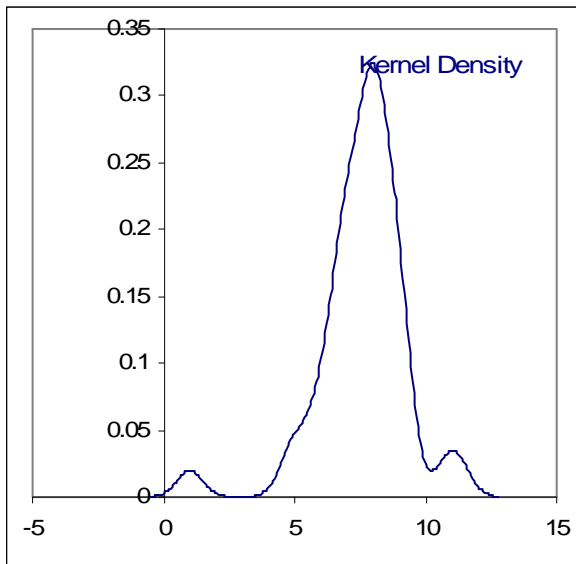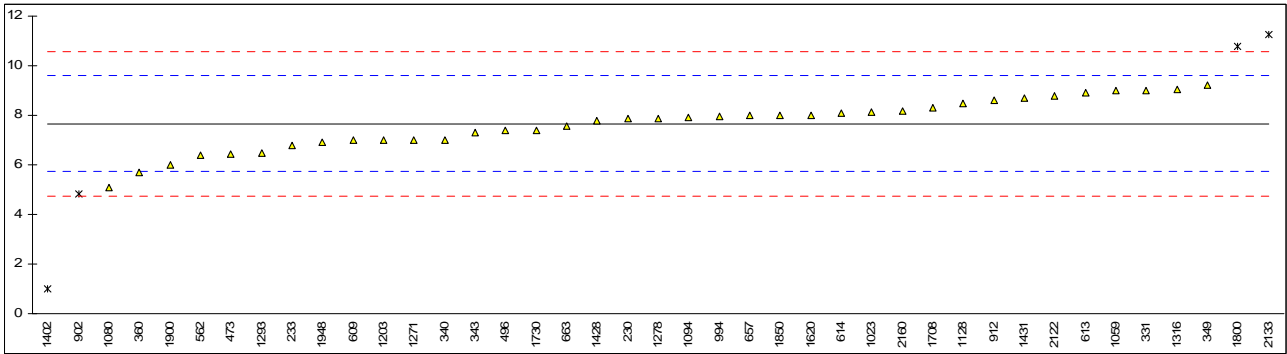
Determination of Nickel (Ni) on sample #11043; results in mg/kg

lab	method	value	mark	z(targ)	remarks
230	D6595	10.80		1.85	
233	D6595	10.152		1.42	
237		-----		-----	
252		-----		-----	
254		-----		-----	
255	In house	7.13		-0.57	
260		-----		-----	
311	D5185	<10		-----	
318	INH-2I	8.3		0.20	
331	D5185mod	8		0.00	
340	D5185	7		-0.66	
343	D5185	7.3		-0.46	
349	D5185	9.03		0.68	
353		-----		-----	
360	D5185	6.3		-1.12	
398	D6595	10.1		1.39	
420		-----		-----	
432		-----		-----	
450		-----		-----	
451		-----		-----	
473	D5185	5.4739		-1.67	
496	D5185	7.2		-0.53	
511	D6595	10.84		1.88	
562	D6595	10.7	C	1.78	First reported 0.0
593		-----		-----	
609	D5185	5.824		-1.44	
613	D5185	8.3		0.20	
614	D5185	7.16		-0.55	
657	D5185	7		-0.66	
663	D5185	8.28		0.19	
840		-----		-----	
862		-----		-----	
875		-----		-----	
902	D5185	8.92	ex	0.61	Result excluded, see §4
912		-----		-----	
963		-----		-----	
994	D5185	8.95		0.63	
1013		-----		-----	
1017		-----		-----	
1023	D5185	6.92		-0.71	
1059	In house	7		-0.66	
1080	D5185	5.1		-1.91	
1094	D5185	7.8		-0.13	
1106		-----		-----	
1128	In house	9.0	C	0.66	First reported 24.25
1146	D5185	7.89		-0.07	
1173		-----		-----	
1203	D5185	7		-0.66	
1231		-----		-----	
1271	D5863	3.97		-2.66	
1278	D5185	7.31		-0.45	
1293	D6595	10.887		1.91	
1316	D5185	8.72		0.48	
1358	IP593	6.6		-0.92	
1402	D5185	<1		<-4.62	False negative?
1406	D4628	8.8		0.53	
1428	D5185	7.4		-0.40	
1431	In house	9.0		0.66	
1526	D5185	7.4		-0.40	
1613		-----		-----	
1620	D5185	8		0.00	
1622	D5185	7.68		-0.21	
1648	D5185	11.15		2.08	
1650		-----		-----	
1660		-----		-----	
1708	D5185	8.3		0.20	
1720		-----		-----	
1730	D5185	7.177		-0.54	
1800	In house	8.2		0.13	
1827		-----		-----	
1833		-----		-----	
1850	In house	8		0.00	
1900	D6595	12.36	G(0.05)	2.88	
1948	D5185	6.38		-1.07	

2122	D5185	8.5	0.33
2133	D5185	7.008	-0.65
2160	In house	10.90	1.92

	normality	OK
	n	47
	outliers	1
	mean (n)	8.00
	st.dev. (n)	1.606
	R(calc.)	4.50
	R(D5185:09)	4.24
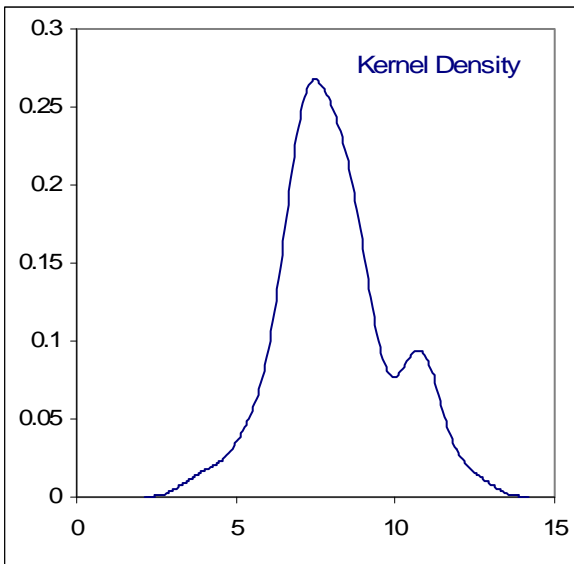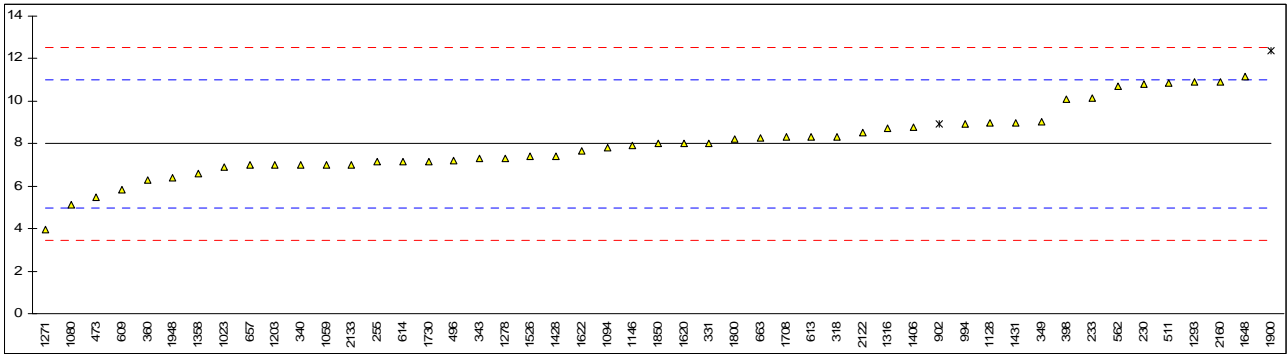
Determination of Sodium (Na) on sample #11043; results in mg/kg

lab	method	value	mark	z(targ)	remarks
230	D6595	71.86		2.35	
233	D6595	87.321		4.62	
237		-----		-----	
252		-----		-----	
254		-----		-----	
255	In house	44.86		-1.60	
260		-----		-----	
311	D5185	58		0.32	
318		-----		-----	
331	D5185mod	50		-0.85	
340	D5185	48		-1.14	
343	D5185	50		-0.85	
349		-----		-----	
353		-----		-----	
360	D5185	87.2		4.60	
398	D6595	87.2		4.60	
420		-----		-----	
432		-----		-----	
450		-----		-----	
451		-----		-----	
473	D5185	57.4199		0.24	
496	D5185	54.4		-0.20	
511		-----		-----	
562	D6595	121.8	C,G(0.05)	9.67	First reported 7.6
593		-----		-----	
609	D5185	64.08		1.21	
613	D5185	54.8		-0.15	
614	D5185	57		0.18	
657	D5185	55		-0.12	
663	D5185	51.66		-0.61	
840		-----		-----	
862		-----		-----	
875		-----		-----	
902	D5185	23.93	ex	-4.67	Result excluded, see §4
912		-----		-----	
963		-----		-----	
994	D5185	53.62		-0.32	
1013		-----		-----	
1017		-----		-----	
1023	D5185	59.9		0.60	
1059		-----		-----	
1080	D5185	52		-0.56	
1094	D5185	52.5		-0.48	
1106		-----		-----	
1128	In house	n.d.		-----	
1146	D5185	50.27		-0.81	
1173		-----		-----	
1203	D5185	54		-0.26	
1231		-----		-----	
1271		-----		-----	
1278	D5185	34.2		-3.16	
1293	D6595	77.201	C	3.14	First reported 8.4
1316	D5185	45.8		-1.46	
1358		-----		-----	
1402	D5185	19	ex	-5.39	Result excluded, see §4.1
1406		-----		-----	
1428	D5185	55		-0.12	
1431	In house	72.4		2.43	
1526		-----		-----	
1613		-----		-----	
1620	D5185	57		0.18	
1622		-----		-----	
1648	D5185	19.62		-5.30	
1650		-----		-----	
1660		-----		-----	
1708	D5185	45.2		-1.55	
1720		-----		-----	
1730	D5185	51.179		-0.68	
1800	In house	49.4		-0.94	
1827		-----		-----	
1833		-----		-----	
1850		-----		-----	
1900	D6595	95		5.74	
1948	D5185	5.68		-7.34	

2122	D5185	63.7	1.16
2133	D5185	36.026	-2.89
2160		-----	-----

normality	not OK	
n	36	
outliers	1	
mean (n)	55.79	
st.dev. (n)	17.678	
R(calc.)	49.50	
R(D5185:09)	19.12	

Kernel Density
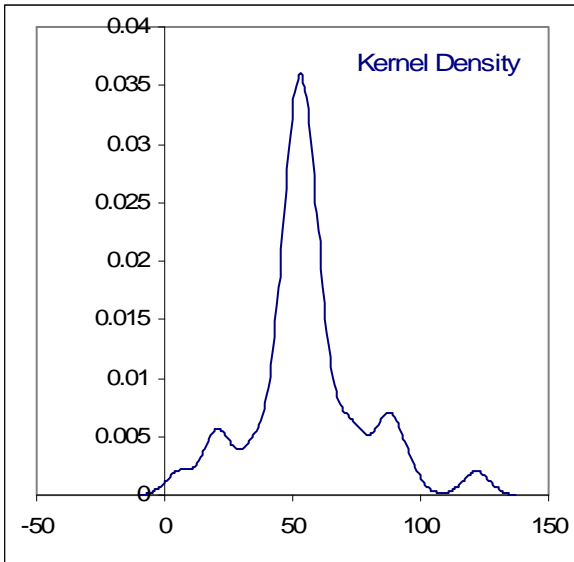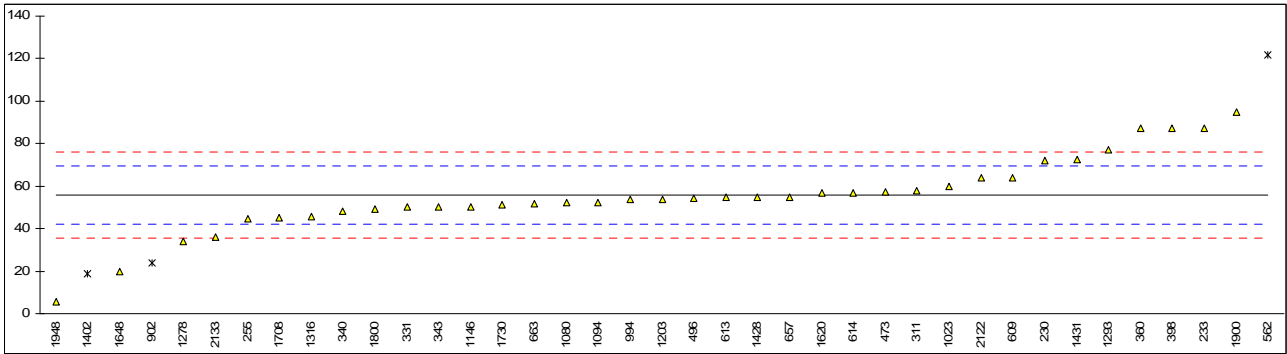
Determination of Silicon (Si) on sample #11043; results in mg/kg

lab	method	value	mark	z(targ)	remarks
230	D6595	18.01		0.84	
233	D6595	16.732		0.42	
237		-----		-----	
252		-----		-----	
254		-----		-----	
255		-----		-----	
260	D5185	53	G(0.01)	12.45	
311	D5185	24		2.83	
318		-----		-----	
331	D5185mod	15		-0.16	
340	D5185	15		-0.16	
343	D5185	15.5		0.01	
349	D5185	16.97		0.50	
353		-----		-----	
360	D5185	15.1		-0.12	
398	D6595	20.4		1.64	
420	In house	11.6		-1.28	
432		-----		-----	
450		-----		-----	
451		-----		-----	
473	D5185	15.9534		0.16	
496	D5185	12.3		-1.05	
511	D6595	17.84		0.79	
562	D6595	20.0	C	1.50	First reported 0.3
593		-----		-----	
609	D5185	13.43		-0.68	
613	D5185	16.5		0.34	
614	D5185	15.17		-0.10	
657	D5185	15		-0.16	
663	D5185	14.52		-0.32	
840		-----		-----	
862		-----		-----	
875		-----		-----	
902	D5185	7.94	ex	-2.50	Result excluded, see §4
912	D5185	16		0.18	
963		-----		-----	
994	D5185	15.34		-0.04	
1013		-----		-----	
1017		-----		-----	
1023	D5185	14.5		-0.32	
1059	In house	20		1.50	
1080	D5185	12		-1.15	
1094	D5185	15.4		-0.02	
1106		-----		-----	
1128	In house	9.0	C	-2.15	First reported 96.5
1146	D5185	14.81		-0.22	
1173		-----		-----	
1203	D5185	15		-0.16	
1231		-----		-----	
1271	D5863	9.667	C	-1.93	First reported 0
1278	D5185	16.6		0.37	
1293	D6595	17.590		0.70	
1316	D5185	11.3		-1.38	
1358		-----		-----	
1402	D5185	5.8	ex	-3.21	Result excluded, see §4
1406		-----		-----	
1428	D5185	15		-0.16	
1431	In house	13.7		-0.59	
1526		-----		-----	
1613		-----		-----	
1620	D5185	16		0.18	
1622	D5185	16.24		0.25	
1648	D5185	16.71		0.41	
1650		-----		-----	
1660		-----		-----	
1708	D5185	15.8		0.11	
1720		-----		-----	
1730	D5185	14.376		-0.36	
1800	In house	15.0		-0.16	
1827		-----		-----	
1833		-----		-----	
1850		-----		-----	
1900	D6595	18.83		1.11	
1948	D5185	12.80		-0.89	

2122	D5185	17.0	0.51
2133	D5185	13.070	-0.80
2160		-----	-----

	normality	OK
	n	44
	outliers	1
	mean (n)	15.47
	st.dev. (n)	2.782
	R(calc.)	7.79
	R(D5185:09)	8.44
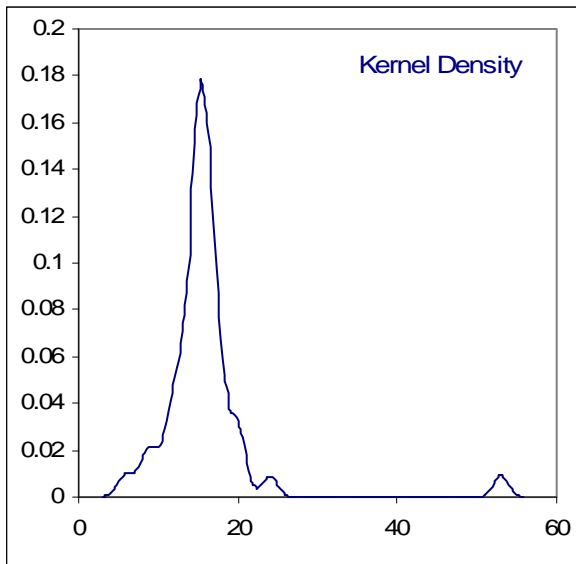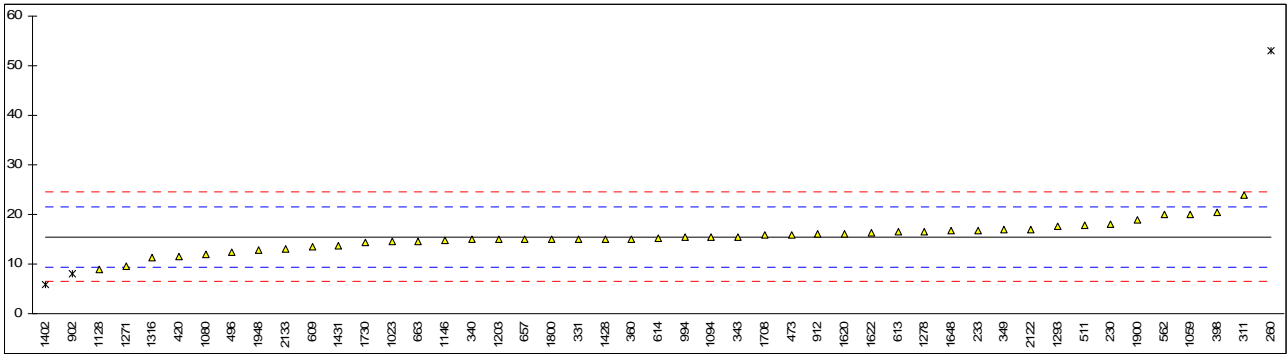
Determination of Silver (Ag) on sample #11043; results in mg/kg

lab	method	value	mark	z(targ)	remarks
230	D6595	8.41		0.23	
233	D6595	8.463		0.28	
237		-----		-----	
252		-----		-----	
254		-----		-----	
255	In house	7.47		-0.69	
260		-----		-----	
311	D5185	<10		-----	
318		-----		-----	
331	D5185mod	7		-1.15	
340	D5185	8		-0.17	
343	D5185	7.5		-0.66	
349	D5185	9.27		1.07	
353		-----		-----	
360	D5185	7.5		-0.66	
398	D6595	11.6		3.35	
420		-----		-----	
432		-----		-----	
450		-----		-----	
451		-----		-----	
473	D5185	6.4858		-1.66	
496	D5185	7.4		-0.76	
511	D6595	9.14		0.94	
562	D6595	7.7	C	-0.47	First reported 0.0
593		-----		-----	
609	D5185	7.251		-0.91	
613	D5185	8.1		-0.08	
614	D5185	10.6		2.37	
657	D5185	4	G(0.05)	-4.09	
663	D5185	7.61		-0.56	
840		-----		-----	
862		-----		-----	
875		-----		-----	
902	D5185	0.15	C,G(0.01)	-7.85	First reported 0.7
912	D5185	8.6		0.41	
963		-----		-----	
994	D5185	7.54		-0.62	
1013		-----		-----	
1017		-----		-----	
1023	D5185	7.82		-0.35	
1059		-----		-----	
1080	D5185	11		2.76	
1094	D5185	9.3		1.10	
1106		-----		-----	
1128	In house	7.0	C	-1.15	First reported 0.0
1146	D5185	7.36		-0.80	
1173		-----		-----	
1203	D5185	7		-1.15	
1231		-----		-----	
1271		-----		-----	
1278	D5185	8.17		-0.01	
1293	D6595	9.045		0.85	
1316	D5185	8.19		0.01	
1358		-----		-----	
1402	D5185	<1		<-6.96	False negative?
1406		-----		-----	
1428	D5185	8.1		-0.08	
1431		-----		-----	
1526		-----		-----	
1613		-----		-----	
1620	D5185	10		1.78	
1622		-----		-----	
1648		-----		-----	
1650		-----		-----	
1660		-----		-----	
1708	D5185	10.3		2.08	
1720		-----		-----	
1730	D5185	6.889		-1.26	
1800	In house	7.8		-0.37	
1827		-----		-----	
1833		-----		-----	
1850	In house	9		0.80	
1900	D6595	6.38		-1.76	
1948	D5185	7.05		-1.10	

2122	D5185	8.3	0.12
2133	D5185	6.590	-1.55
2160	In house	8.00	-0.17

normality	OK
n	39
outliers	2
mean (n)	8.18
st.dev. (n)	1.247
R(calc.)	3.49
R(D5185:09)	2.86
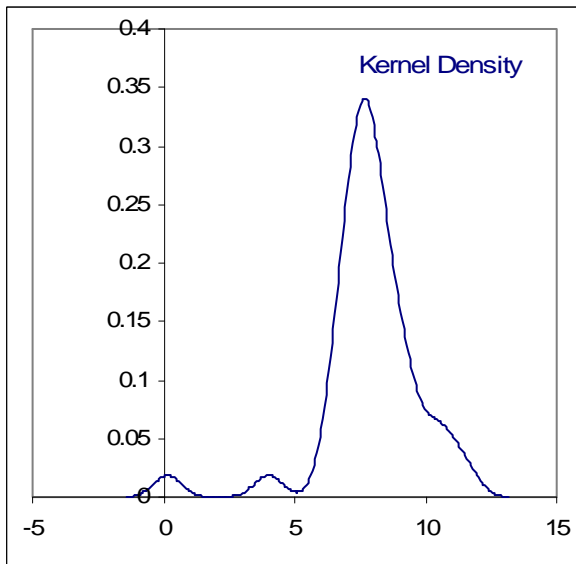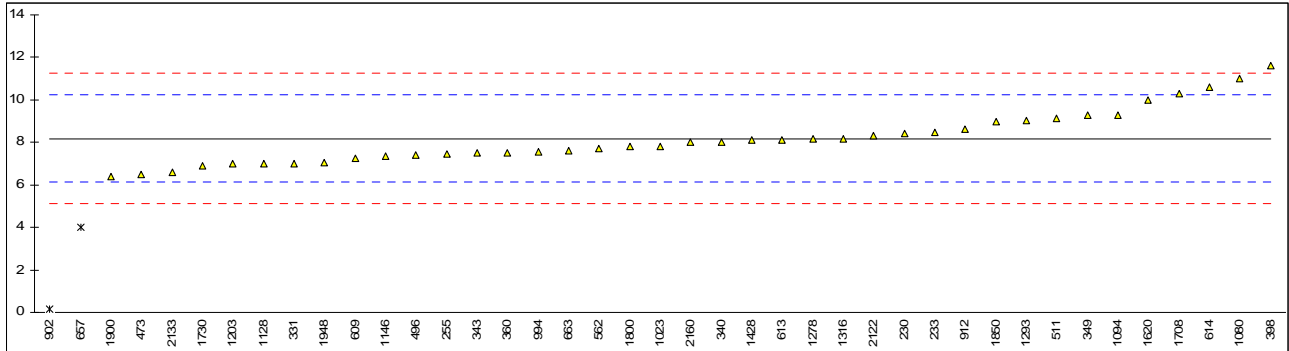
Determination of Tin (Sn) on sample #11043; results in mg/kg

lab	method	value	mark	z(targ)	remarks
230	D6595	5.88		-0.56	
233	D6595	0.246	DG(0.05)	-2.74	
237		-----		-----	
252		-----		-----	
254		-----		-----	
255		-----		-----	
260	D5185	8.7		0.54	
311	D5185	10		1.04	
318	INH-2I	<10		-----	
331	D5185mod	8		0.27	
340	D5185	7		-0.12	
343	D5185	7.2		-0.04	
349	D5185	7.56		0.10	
353		-----		-----	
360	D5185	5.1		-0.86	
398	D6595	0.5	G(0.05)	-2.65	
420		-----		-----	
432		-----		-----	
450		-----		-----	
451		-----		-----	
473	D5185	6.9759		-0.13	
496	D5185	7.2		-0.04	
511		-----		-----	
562	D6595	1.0	C,G(0.01)	-2.45	First reported 0.0
593		-----		-----	
609	D5185	3.682		-1.41	
613	D5185	7.8		0.19	
614	D5185	6.33		-0.38	
657	D5185	9		0.66	
663	D5185	7.36		0.02	
840		-----		-----	
862		-----		-----	
875		-----		-----	
902	D5185	6.03	ex	-0.50	Result excluded, see §4
912	D5185	9.5		0.85	
963		-----		-----	
994	D5185	6.78		-0.21	
1013		-----		-----	
1017		-----		-----	
1023	D5185	7.53		0.09	
1059	In house	8		0.27	
1080	D5185	4.3		-1.17	
1094	D5185	7.5		0.07	
1106		-----		-----	
1128	In house	7.4		0.03	
1146	D5185	7.28		-0.01	
1173		-----		-----	
1203	D5185	7		-0.12	
1231		-----		-----	
1271	D5863	6.0803	C	-0.48	First reported 26.26
1278	D5185	7.48		0.07	
1293	D6595	4.476		-1.10	
1316	D5185	9.04		0.67	
1358		-----		-----	
1402	D5185	<1		<-2.45	False negative?
1406		-----		-----	
1428	D5185	7.7		0.15	
1431	In house	6.8		-0.20	
1526		-----		-----	
1613		-----		-----	
1620	D5185	<1		<-2.45	False negative?
1622	D5185	8.66		0.52	
1648	D5185	7.739		0.17	
1650		-----		-----	
1660		-----		-----	
1708	D5185	7.3		0.00	
1720		-----		-----	
1730	D5185	7.212		-0.04	
1800	In house	9.9		1.01	
1827		-----		-----	
1833		-----		-----	
1850	In house	8		0.27	
1900	D6595	0.398	DG(0.05)	-2.68	
1948	D5185	6.46		-0.33	

2122	D5185	7.1	-0.08
2133	D5185	6.916	-0.15
2160	In house	8.48	0.45

	normality	not OK
	n	40
	outliers	4
	mean (n)	7.31
	st.dev. (n)	1.372
	R(calc.)	3.84
	R(D5185:09)	7.21
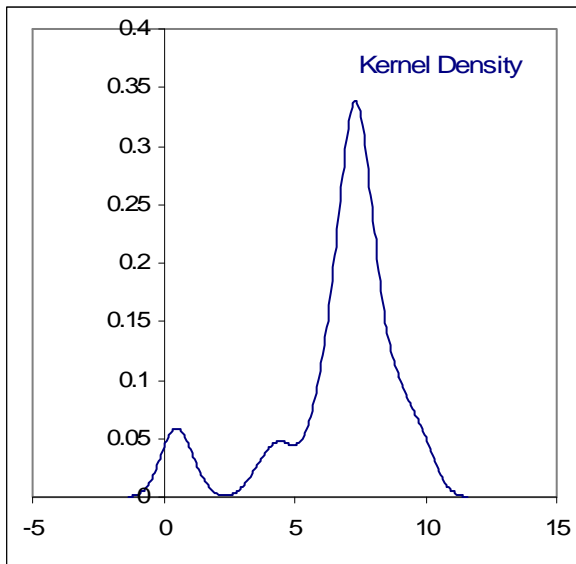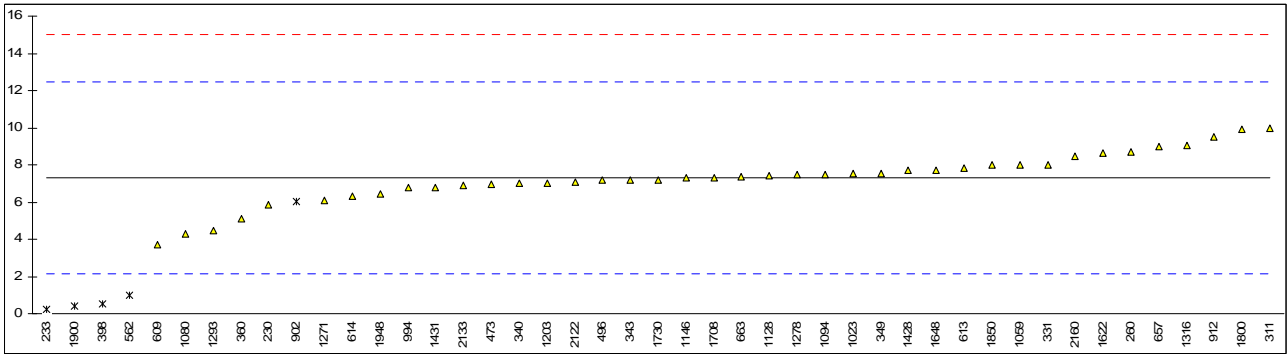
Determination of Titanium (Ti) on sample #11043; results in mg/kg

lab	method	value	mark	z(targ)	remarks
230	D6595	8.2		0.33	
233	D6595	6.964		-0.21	
237		-----		-----	
252		-----		-----	
254		-----		-----	
255		-----		-----	
260		-----		-----	
311	D5185	<10		-----	
318		-----		-----	
331	D5185mod	8		0.24	
340	D5185	7		-0.20	
343	D5185	7.5		0.02	
349	D5185	10.40	G(0.01)	1.29	
353		-----		-----	
360	D5185	7.5		0.02	
398	D6595	8.1		0.28	
420		-----		-----	
432		-----		-----	
450		-----		-----	
451		-----		-----	
473	D5185	7.8193		0.16	
496	D5185	7.3		-0.06	
511	D6595	6.78		-0.29	
562	D6595	0.3	C,G(0.01)	-3.12	First reported 0.0
593		-----		-----	
609	D5185	7.182		-0.12	
613	D5185	8.1		0.28	
614	D5185	7.8		0.15	
657	D5185	8		0.24	
663	D5185	6.99		-0.20	
840		-----		-----	
862		-----		-----	
875		-----		-----	
902	D5185	5.22	ex	-0.97	Result excluded, see §4
912	D5185	7.9		0.20	
963		-----		-----	
994	D5185	7.39		-0.03	
1013		-----		-----	
1017		-----		-----	
1023	D5185	8.01		0.25	
1059		-----		-----	
1080		-----		-----	
1094	D5185	7.2		-0.11	
1106		-----		-----	
1128	In house	5.85		-0.70	
1146	D5185	7.43		-0.01	
1173		-----		-----	
1203	D5185	7		-0.20	
1231		-----		-----	
1271		-----		-----	
1278	D5185	6.93		-0.23	
1293	D6595	7.259		-0.08	
1316	D5185	8.56		0.48	
1358		-----		-----	
1402	D5185	<1		<-2.81	False negative?
1406		-----		-----	
1428	D5185	7.2		-0.11	
1431		-----		-----	
1526		-----		-----	
1613		-----		-----	
1620	D5185	8		0.24	
1622		-----		-----	
1648		-----		-----	
1650		-----		-----	
1660		-----		-----	
1708	D5185	7.9		0.20	
1720		-----		-----	
1730	D5185	6.570		-0.38	
1800	In house	8.0		0.24	
1827		-----		-----	
1833		-----		-----	
1850	In house	12	G(0.01)	1.98	
1900	D6595	0.00	ex	-3.25	Result excluded, zero is not a real result
1948	D5185	6.83		-0.27	

2122	D5185	8.2	0.33
2133	D5185	6.314	-0.49
2160		-----	-----

	normality	OK
	n	33
	outliers	3
	mean (n)	7.45
	st.dev. (n)	0.618
	R(calc.)	1.73
	R(D5185:09)	6.42
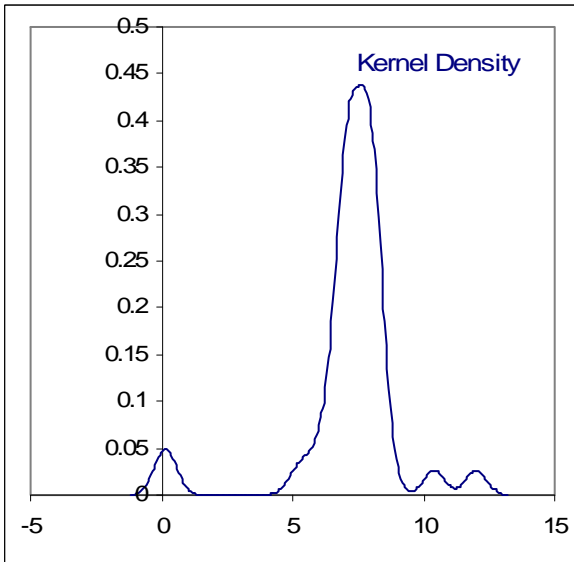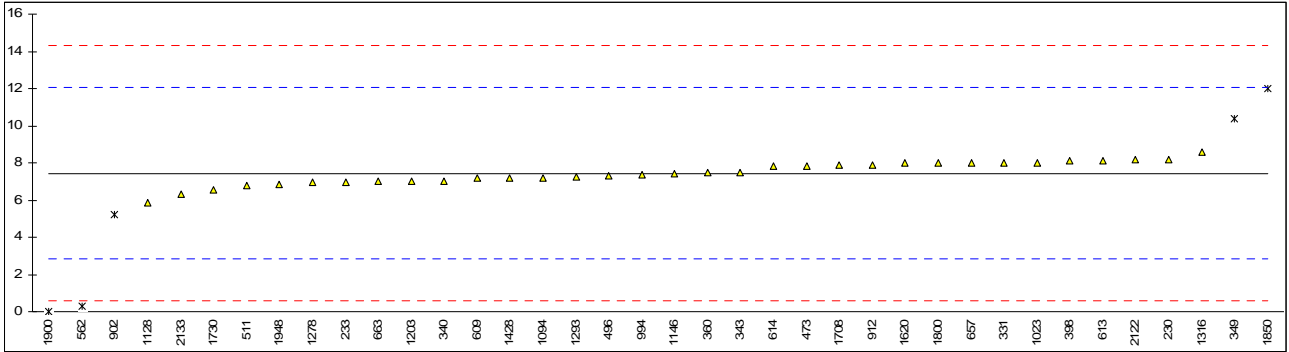
Determination of Vanadium (V) on sample #11043; results in mg/kg

lab	method	value	mark	z(targ)	remarks
230	D6595	9.89		2.06	
233	D6595	9.377		1.53	
237		-----		-----	
252		-----		-----	
254		-----		-----	
255		-----		-----	
260		-----		-----	
311	D5185	<10		-----	
318	INH-2I	8.6		0.73	
331	D5185mod	8		0.11	
340	D5185	7		-0.92	
343	D5185	7.8		-0.10	
349	D5185	10.02		2.19	
353		-----		-----	
360	D5185	7.4		-0.51	
398	D6595	8.9		1.04	
420		-----		-----	
432		-----		-----	
450		-----		-----	
451		-----		-----	
473	D5185	5.7136		-2.25	
496	D5185	7.3		-0.61	
511	D6595	9.87		2.03	
562	D6595	10.9	C	3.10	First reported 0.0
593		-----		-----	
609	D5185	7.600		-0.30	
613	D5185	8.0		0.11	
614	D5185	8.0		0.11	
657	D5185	7		-0.92	
663	D5185	7.36		-0.55	
840		-----		-----	
862		-----		-----	
875		-----		-----	
902	D5185	3.61	ex	-4.41	Result excluded, see §4
912	D5185	8.1		0.21	
963		-----		-----	
994	D5185	7.87		-0.03	
1013		-----		-----	
1017		-----		-----	
1023	D5185	7.94		0.05	
1059	In house	8		0.11	
1080	D5185	5.1		-2.88	
1094	D5185	7.6		-0.30	
1106		-----		-----	
1128	In house	7.2		-0.72	
1146	D5185	7.25		-0.66	
1173		-----		-----	
1203	D5185	6		-1.95	
1231		-----		-----	
1271	D5863	13.33	G(0.05)	5.60	
1278	D5185	7.28		-0.63	
1293	D6595	9.91		2.08	
1316	D5185	8.21		0.32	
1358	IP593	6.5		-1.44	
1402	D5185	<1		<-7.09	False negative?
1406		-----		-----	
1428	D5185	7.7		-0.20	
1431	In house	8.1		0.21	
1526	D5185	7.65		-0.25	
1613		-----		-----	
1620	D5185	8		0.11	
1622	D5185	8.67		0.80	
1648	D5185	8.094		0.21	
1650		-----		-----	
1660		-----		-----	
1708	D5185	8.3		0.42	
1720		-----		-----	
1730	D5185	6.701		-1.23	
1800	In house	8.0		0.11	
1827		-----		-----	
1833		-----		-----	
1850	In house	6		-1.95	
1900		-----		-----	
1948	D5185	6.82		-1.11	

2122	D5185	8.5	0.62
2133	D5185	6.316	-1.63
2160	In house	10.73	2.92

normality	not OK
n	45
outliers	1
mean (n)	7.89
st.dev. (n)	1.257
R(calc.)	3.52
R(D5185:09)	2.72
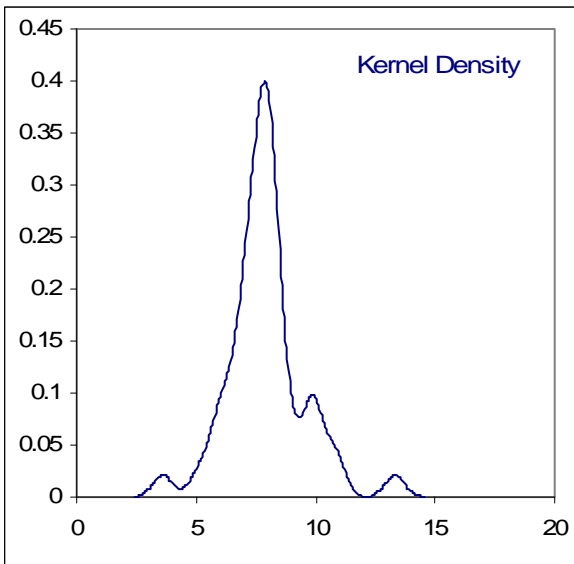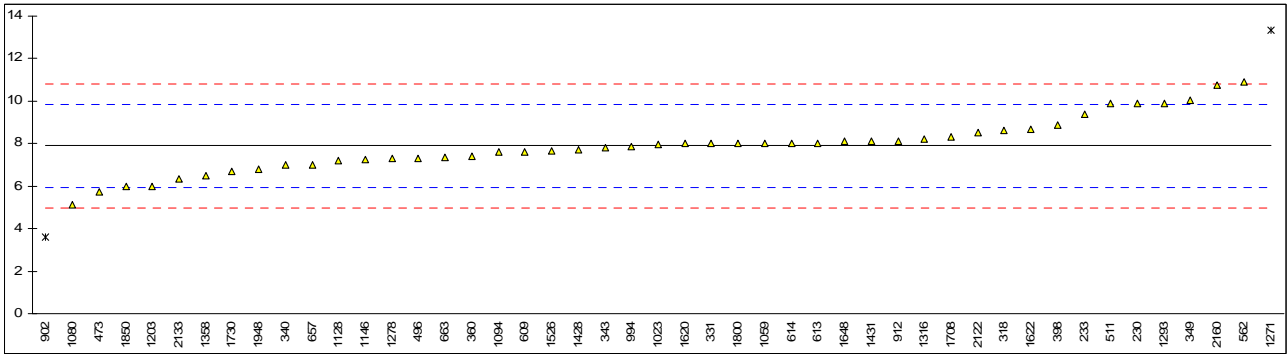
Determination of Calcium (Ca) on sample #11043; results in mg/kg

lab	method	value	mark	z(targ)	remarks
230	D6595	3712		-1.90	
233	D6595	4204.5		-0.13	
237		-----		-----	
252	IP308	3992.22		-0.90	
254	IP308	3990.224		-0.90	
255	In house	3476.15		-2.75	
260		-----		-----	
311	D5185	4400		0.57	
318		-----		-----	
331	D5185mod	4081		-0.58	
340	D5185	4189		-0.19	
343	D5185	4400		0.57	
349	D5185	4336		0.34	
353		-----		-----	
360	D5185	4450		0.75	
398	D6595	2886	DG(0.05)	-4.87	
420	DIN51391	4130		-0.40	
432		-----		-----	
450		-----		-----	
451		-----		-----	
473	D5185	4644.290		1.45	
496	D5185	4270		0.10	
511		-----		-----	
562	D6595	2645.5	C,G(0.05)	-5.73	First reported 2399
593		-----		-----	
609	D5185	4435		0.69	
613	D5185	3945.4		-1.06	
614	D5185	4717		1.71	
657	D5185	4350		0.39	
663	D5185	4078.98		-0.58	
840	UOP389	3885.6		-1.28	
862		-----		-----	
875		-----		-----	
902	D5185	3124.5	C,DG(0.05)	-4.01	First reported 3143
912		-----		-----	
963		-----		-----	
994	D5185	3671		-2.05	
1013	D5185	4590		1.25	
1017		-----		-----	
1023	D5185	4407		0.59	
1059	In house	4207		-0.12	
1080	D5185	4586		1.24	
1094	D5185	4158.5		-0.30	
1106		-----		-----	
1128	In house	4204.95		-0.13	
1146	D5185	3956		-1.03	
1173		-----		-----	
1203	D5185	4031		-0.76	
1231		-----		-----	
1271	D6481	4302.0		0.22	
1278	D5185	4480		0.86	
1293	D6595	4676.8		1.56	
1316	D5185	3940		-1.08	
1358		-----		-----	
1402	D5185	3340	DG(0.05)	-3.24	
1406	D4628	3818		-1.52	
1428	D5185	4255		0.05	
1431	In house	4108		-0.48	
1526		-----		-----	
1613		-----		-----	
1620	D5185	4656		1.49	
1622	D5185	4939.67		2.51	
1648	D5185	4427		0.67	
1650		-----		-----	
1660		-----		-----	
1708	D5185	4374		0.47	
1720		-----		-----	
1730	D5185	4424.237		0.66	
1800	In house	4151		-0.33	
1827		-----		-----	
1833		-----		-----	
1850	In house	4561		1.15	
1900	D6595	4278.20		0.13	
1948	D5185	3172.0	DG(0.05)	-3.84	

2122	D5185	3750	-1.77
2133	D5185	4347.36	0.38
2160	In house	4375.1	0.48

normality	OK
n	47
outliers	5
mean (n)	4241.7
st.dev. (n)	302.48
R(calc.)	847.0
R(D5185:09)	779.6
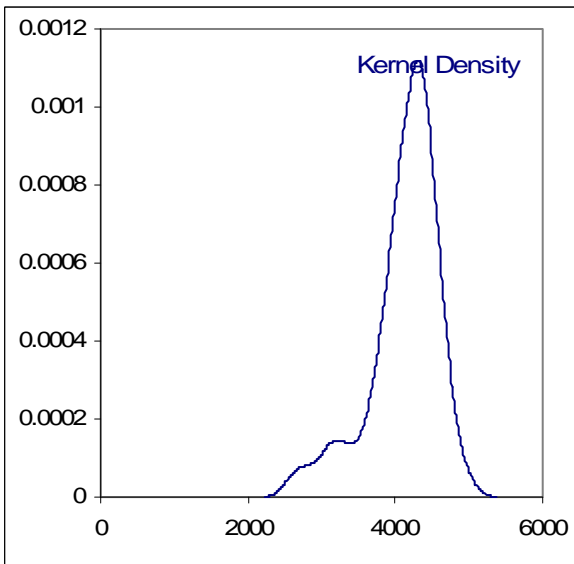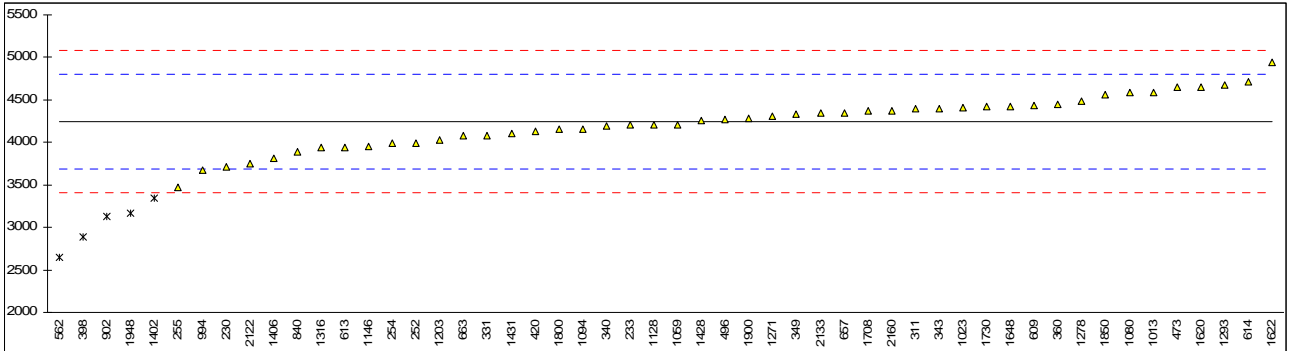
Determination of Phosphorus (P) on sample #11043; results in mg/kg

lab	method	value	mark	z(targ)	remarks
230	D6595	727.52		1.04	
233	D6595	732.62		1.16	
237		-----		-----	
252		-----		-----	
254		-----		-----	
255		-----		-----	
260		-----		-----	
311	D5185	770		2.09	
318		-----		-----	
331	D5185mod	679		-0.17	
340	D5185	688		0.05	
343	D5185	700		0.35	
349	D5185	685		-0.02	
353		-----		-----	
360	D5185	483	G(0.01)	-5.04	
398	D6595	601.6		-2.10	
420		-----		-----	
432		-----		-----	
450		-----		-----	
451		-----		-----	
473	D5185	717.804		0.79	
496	D5185	584.9		-2.51	
511	D6595	740.99		1.37	
562	D6595	612	C	-1.84	First reported 878
593		-----		-----	
609	D5185	695	C	0.23	First reported 891.8
613	D5185	624.7		-1.52	
614	D5185	709.2		0.58	
657	D5185	705		0.48	
663	D5185	672.18		-0.34	
840	UOP389	670.0		-0.39	
862		-----		-----	
875		-----		-----	
902	D5185	416.8	C,G(0.01)	-6.69	First reported 443.5
912	D5185	681		-0.12	
963		-----		-----	
994	D5185	638.8		-1.17	
1013		-----		-----	
1017		-----		-----	
1023	D5185	697		0.28	
1059	In house	640		-1.14	
1080	D5185	713		0.67	
1094	D5185	683.8		-0.05	
1106		-----		-----	
1128	In house	680.6		-0.13	
1146	D5185	662.90		-0.57	
1173		-----		-----	
1203	D5185	680		-0.15	
1231		-----		-----	
1271	D6481	669.0		-0.42	
1278	D5185	730		1.10	
1293	D6595	782.85		2.41	
1316	D5185	690		0.10	
1358		-----		-----	
1402	D5185	816	ex	3.24	Result excluded, see §4
1406		-----		-----	
1428	D5185	703		0.43	
1431	In house	678		-0.20	
1526		-----		-----	
1613		-----		-----	
1620	D5185	708		0.55	
1622	D5185	679.45		-0.16	
1648	D5185	715.8		0.74	
1650		-----		-----	
1660		-----		-----	
1708	D5185	708.4		0.56	
1720		-----		-----	
1730	D5185	647.891		-0.94	
1800	In house	708		0.55	
1827		-----		-----	
1833		-----		-----	
1850		-----		-----	
1900	D6595	662.19		-0.59	
1948	D5185	1081.0	G(0.01)	9.82	

2122	D5185	607.5	-1.95
2133	D5185	723.849	0.94
2160		-----	-----

normality	OK
n	42
outliers	3
mean (n)	685.9
st.dev. (n)	42.21
R(calc.)	118.2
R(D5185:09)	112.6
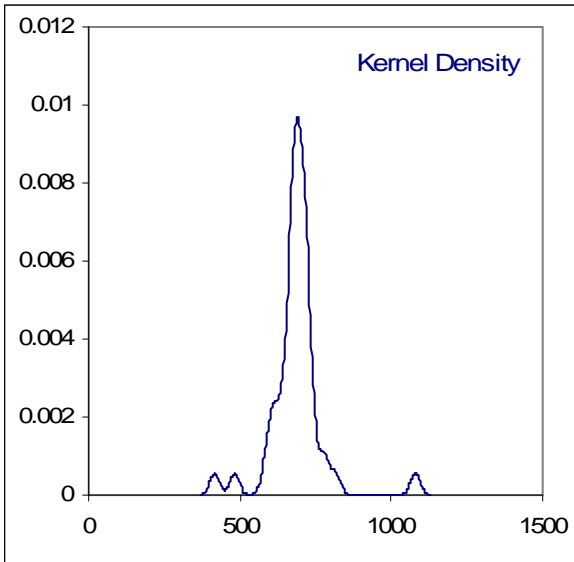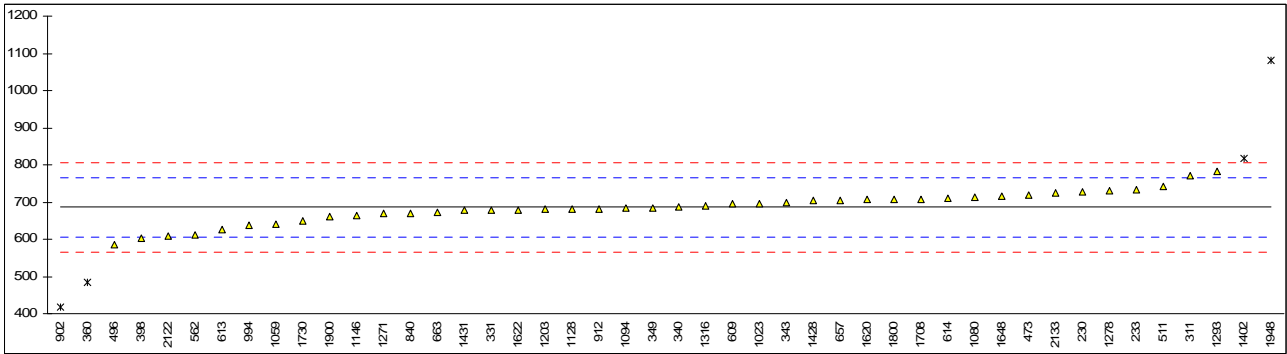
Determination of Zinc (Zn) on sample #11043; results in mg/kg

lab	method	value	mark	z(targ)	remarks
230	D6595	703.33		-1.48	
233	D6595	755.47		-0.31	
237		-----		-----	
252	IP308	831.29		1.40	
254	IP308	830.34		1.38	
255	In house	817.17		1.08	
260		-----		-----	
311	D5185	800		0.70	
318		-----		-----	
331	D5185mod	815		1.04	
340	D5185	777		0.18	
343	D5185	850		1.83	
349	D5185	731		-0.86	
353		-----		-----	
360	D5185	821		1.17	
398	D6595	500.5	G(0.01)	-6.06	
420	DIN51391	770		0.02	
432		-----		-----	
450		-----		-----	
451		-----		-----	
473	D5185	862.367		2.10	
496	D5185	704.6		-1.46	
511		-----		-----	
562	D6595	858	C	2.01	First reported 1230
593		-----		-----	
609	D5185	780	C	0.25	First reported 732.4
613	D5185	703.1		-1.49	
614	D5185	721.5		-1.07	
657	D5185	783		0.31	
663	D5185	728.84		-0.91	
840	UOP389	739.8		-0.66	
862		-----		-----	
875		-----		-----	
902	D5185	400	C,G(0.01)	-8.33	First reported 438
912	D5185	742		-0.61	
963		-----		-----	
994	D5185	790.6		0.49	
1013	D5185	760		-0.21	
1017		-----		-----	
1023	D5185	769		0.00	
1059	In house	732		-0.84	
1080	D5185	824		1.24	
1094	D5185	749.8		-0.44	
1106		-----		-----	
1128	In house	753.45		-0.35	
1146	D5185	748.80		-0.46	
1173		-----		-----	
1203	D5185	752		-0.39	
1231		-----		-----	
1271	D6481	761.0		-0.18	
1278	D5185	772		0.07	
1293	D6595	760.59		-0.19	
1316	D5185	780		0.25	
1358	IP593	708.9		-1.36	
1402	D5185	942	G(0.05)	3.90	
1406	D4628	762		-0.16	
1428	D5185	792		0.52	
1431	In house	753		-0.36	
1526	D5185	705		-1.45	
1613		-----		-----	
1620	D5185	822		1.19	
1622	D5185	717.73		-1.16	
1648	D5185	749.2		-0.45	
1650		-----		-----	
1660		-----		-----	
1708	D5185	783.3		0.32	
1720		-----		-----	
1730	D5185	753.321		-0.36	
1800	In house	754		-0.34	
1827		-----		-----	
1833		-----		-----	
1850	In house	837		1.53	
1900	D6595	771.13		0.05	
1948	D5185	420.7	C,G(0.01)	-7.86	First reported 798.4

2122	D5185	676.8	-2.08
2133	D5185	807.852	0.87
2160	In house	752.7	-0.37

normality	OK
n	51
outliers	4
mean (n)	769.1
st.dev. (n)	43.74
R(calc.)	122.5
R(D5185:09)	124.1
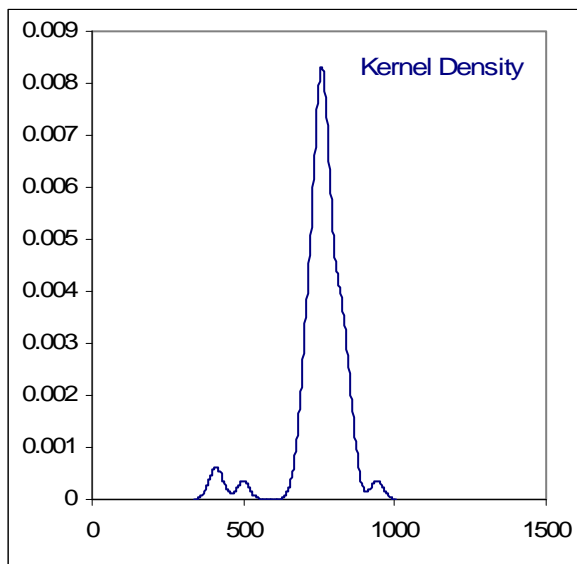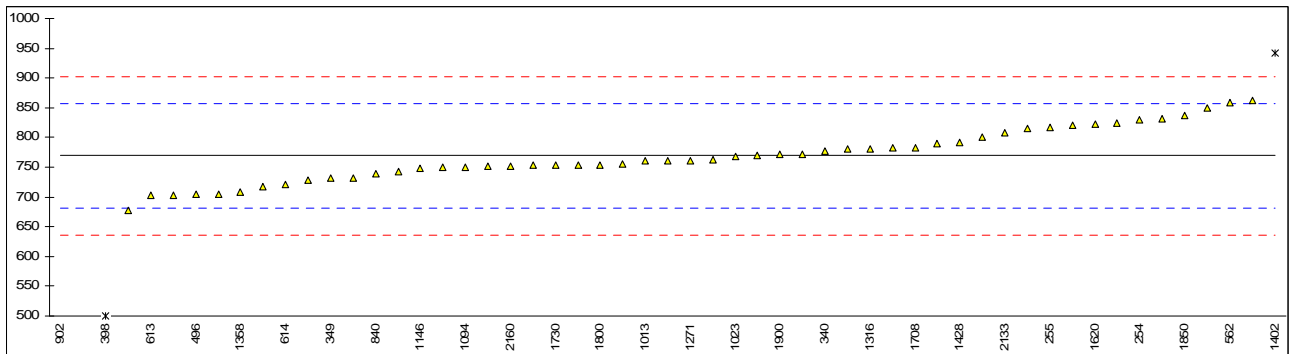
APPENDIX 2

Number of participants per country

2 laboratories in AUSTRALIA
1 laboratory in AUSTRIA
1 laboratory in AZERBAIJAN
1 laboratory in BELGIUM
1 laboratory in BOSNIA and HERZEGOVINA
1 laboratory in BULGARIA
1 laboratory in CHILE
1 laboratory in CROATIA
1 laboratory in CZECH REPUBLIC
1 laboratory in DENMARK
1 laboratory in ECUADOR
2 laboratories in FRANCE
1 laboratory in GERMANY
1 laboratory in GHANA
4 laboratories in GREECE
2 laboratories in HUNGARY
1 laboratory in INDIA
1 laboratory in INDONESIA
1 laboratory in IRELAND
2 laboratories in ITALY
1 laboratory in JORDAN
2 laboratories in KENYA
2 laboratories in MALAYSIA
1 laboratory in MAURITIUS
1 laboratory in NEGARA BRUNEI DARUSSALAM
1 laboratory in NIGERIA
3 laboratories in NORWAY
2 laboratories in P.R. of CHINA
1 laboratory in PERU
2 laboratories in POLAND
1 laboratory in PORTUGAL
1 laboratory in REPUBLIC OF MACEDONIA
1 laboratory in RUSSIA
1 laboratory in SAUDI ARABIA
1 laboratory in SINGAPORE
1 laboratory in SLOVENIA
4 laboratories in SPAIN
1 laboratory in SUDAN
1 laboratory in SWEDEN
1 laboratory in TANZANIA
2 laboratories in THAILAND
4 laboratories in THE NETHERLANDS
6 laboratories in TURKEY
7 laboratories in UNITED KINGDOM
1 laboratory in VIETNAM
1 laboratory in ZAMBIA

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   iis. Interlaboratory Studies, Protocol for the Organization, Statistics and Evaluation, January 2010
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/).