Results of Proficiency Test
Biodiesel B100 (100% FAME)
April 2020

Organized by: Institute for Interlaboratory Studies
Spijkenisse, the Netherlands

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1 INTRODUCTION

Since 2001 the Institute for Interlaboratory Studies organizes proficiency tests (PT) for Fatty Acid Methyl Esters (FAME) used as Biodiesel B100 every year. Since 2008 two PTs are organized for Biodiesel 100% FAME (B100). During the annual proficiency testing program of 2019/2020 it was decided to continue with both proficiency tests on Biodiesel B100 in accordance with the latest applicable version of ASTM D6751 and EN14214+A2.
The number of participants per proficiency test of Biodiesel B100 are:

- 48 laboratories in 25 different countries for the regular round (iis20G03),
- 23 laboratories in 12 different countries for the Metals in Biodiesel (iis20G03M),
- 31 laboratories in 16 different countries for the Total Contamination (iis20G03TC) and
- 22 laboratories in 10 different countries for the Cold Soak Test (iis20G03CST).

In this interlaboratory study in total 51 laboratories from 26 different countries registered for participation. See appendix 2 for a list of number of participants per country.
In this report the results of the Biodiesel B100 proficiency test are presented and discussed. This report is also electronically available through the iis website www.iisnl.com.

2 SET UP

In this proficiency test on Biodiesel B100 a sample of Rapeseed Methyl Ester was used. Sample analyses for fit-for-use and homogeneity testing were subcontracted to an ISO/IEC17025 accredited laboratory. In this proficiency test, the participants received, depending on the registration, from one up to four different samples of Biodiesel B100, see table below.

Samples	Amount in L	Purpose	Remarks
#20050	1.5	For regular analyzes	none
#20051	0.1	Analysis of metals	Spike with Na, P, K and Ca
#20052	1	Total Contamination	Spike with Arizona dust (fine)
#20053	0.5	Cold Soak Test	none

Table 1: four different Biodiesel B100 samples used in iis20G03

Participants were requested to report rounded and unrounded test results. The unrounded test 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/IEC17043:2010 (R007), since January 2000, by the Dutch Accreditation Council (Raad voor Accreditatie). This PT falls under the accredited scope. This ensures strict adherence to protocols for sample preparation and statistical evaluation and 100% confidentiality of participant's data. Feedback from the participants on the reported data is encouraged and customer's satisfaction is measured on regular basis by sending out 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 Organisation, Statistics and Evaluation' of June 2018 (iis-protocol, version 3.5). This protocol is electronically available through the iis website www.iisnl.com, from the FAQ page.

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

The necessary bulk material of approximately 200L of Biodiesel B100 (RME) was obtained from a European producer.

After homogenization 76 amber glass bottles of 1L and 76 amber glass bottles of 0.5L for the regular round were filled and labelled #20050. Also, 30 amber glass bottles of 0.5L for the Cold Soak Test round were filled and labelled #20053. The homogeneity of the subsamples #20050 and #20053 were checked by the determination of Density in accordance with ISO12185 on 8 stratified randomly selected subsamples.

	Density at 15°C in kg/m^3
sample #20050-1	883.67
sample #20050-2	883.65
sample #20050-3	883.65
sample #20050-4	883.65
sample #20050-5	883.65
sample #20050-6	883.64
sample #20050-7	883.64
sample #20050-8	883.64

Table 2: homogeneity test results of subsamples #20050 and #20053

From the above test results the repeatability was calculated and compared with 0.3 times the reproducibility of the reference test method in agreement with the procedure of ISO13528, Annex B2 in the next table.

	Density at 15°C in kg/m^3
r (observed)	0.03
reference test method	ISO12185:96
0.3 x R (ref. test method)	0.15

Table 3: evaluation of the repeatability of subsamples #20050 and #20053

The calculated repeatability was in agreement with 0.3 times the reproducibility of the reference test method. Therefore, the homogeneity of the subsamples #20050 and #20053 was assumed.

From the remaining material approximately 4.5 kg was taken and spiked with Phosphorus, Sodium, Potassium and Calcium. After homogenization 40 PE bottles of 0.1L were filled and labelled #20051. The homogeneity of the subsamples of #20051 was checked by the determination of Phosphorus in accordance with EN14107, Sodium and Potassium in accordance with EN14538 on 8 stratified randomly selected subsamples.

	Phosphorus in mg/kg	Sodium in mg/kg	Potassium in mg/kg
sample #20051-1	11.0	11.6	10.8
sample #20051-2	11.3	12.3	11.9
sample #20051-3	11.4	12.7	12.3
sample #20051-4	11.2	12.5	12.1
sample #20051-5	11.3	12.7	12.4
sample #20051-6	11.1	12.5	12.0
sample #20051-7	11.2	12.8	12.3
sample #20051-8	11.2	12.8	12.4

Table 48: homogeneity test results of subsamples #20051

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

	Phosphorus in mg/kg	Sodium in mg/kg	Potassium in mg/kg
r (observed)	0.35	1.12	1.47
reference test method	EN14107:03	EN14108:03	EN14109:03
0.3 x R (ref. test method)	0.65	1.39	1.98

Table 5: evaluation of repeatabilities of subsamples #20051

The calculated repeatabilities were in agreement with 0.3 times the corresponding reproducibilities of the reference test methods. Therefore, the homogeneity of the subsamples was assumed.

For the preparation of the subsamples for Total Contamination 1 ml of a freshly prepared and ultrasonically homogenized 16.5 g/kg Arizona Dust (fine) in oil suspension was pipetted into 45 amber glass bottles. The addition was checked by weighing each bottle before and after the addition of the oil suspension. Subsequently each bottle was filled with one liter Biodiesel B100. The bottles were labelled #20052.

Depending on the registration of the participant the appropriate set of PT samples was sent on March 25, 2020. An SDS was added to the sample package

2.5 STABILITY OF THE SAMPLES

The stability of the Biodiesel B100 packed in the amber glass bottles and PE bottles was checked. The material was found sufficiently stable for the period of the proficiency test.

2.6 ANALYSES

The requested analyses for the Biodiesel B100 samples are in accordance with the requirements of EN14214:12+A2:19 and/or ASTM D6751:19.

Parameter	EN14214:12+A2:19	Parameter	ASTM D6751:19
Acid Value	EN14104	Acid Number	ASTM D664
Calorific Value	DIN51900		
		Carb. Res. 100% FAME	ASTM D4530
CFPP	EN116		
Cloud Point	EN23015	Cloud Point	ASTM D2500
Copper Strip Corrosion	ISO2160	Copper Strip Corrosion	ASTM D130
Density at 15°C	ISO12185		
		Distillation	ASTM D1160
Flash Point (Recc)	ISO3679		
Flash Point (PMcc)	ISO2719	Flash Point	ASTM D93
Iodine Value	EN14111		
Kin. Viscosity at 40°C	ISO3104	Kin. Viscosity at 40°C	ASTM D445
Oxidation Stability	EN14112	Oxidation Stability	EN15751
Sulfated Ash	ISO3987	Sulfated Ash	ASTM D874
Sulfur	ISO20846	Sulfur	ASTM D5453
Water	ISO12937	Water and Sediment	ASTM D2709
Cetane Number	EN5165	Cetane Number	ASTM D613
		Derived Cetane Number	ASTM D7668
Calcium + Magnesium	EN14538	Calcium + Magnesium	EN14538
Phosphorus	EN14107	Phosphorus	ASTM D4951
Potassium + Sodium	EN14108/14109	Potassium + Sodium	EN14538
Polyunsaturated esters	EN15779		
Methanol	EN14110	Methanol	EN14110
mono-, di-, tri-Glycerides	EN14105	Monoglyceride content	ASTM D6584

Parameter	EN14214:12+A2:19	Parameter	ASTM D6751:19
Free + Total Glycerol	EN14105	Free + Total Glycerol	ASTM D6584
Total ester content	EN14103		
Linolenic Acid	EN14103		
Total Contamination	EN12662		

Table 6: requirements and test methods acc. to specifications EN14214:12+A2:19 and/or ASTM D6751:19.

It was explicitly requested to treat the samples as if they were routine samples and to report the test results using the indicated units on the report form and not to round the test results but report as much significant figures as possible. It was also requested not to report 'less than' test results, which are above the detection limit, because such test results cannot be used for meaningful statistical calculations.

To get comparable test results, a detailed report form and a letter of instructions are prepared. On the report form the reporting units are given as well as the reference test methods that will be used during the evaluation. The detailed report form and the letter of instructions are both made available on the data entry portal www.kpmd.co.uk/sgs-iis/. The participating laboratories are also requested to confirm the sample receipt on this data entry portal. The letter of instructions can also be downloaded from the iis website www.iisnl.com.

3 RESULTS

During five weeks after sample dispatch, the test results of the individual laboratories were gathered via the data entry portal www.kpmd.co.uk/sgs-iis/. The reported test results are tabulated per determination in appendix 1 of this report. The laboratories are presented by their code numbers.
Directly after the deadline, a reminder was sent to those laboratories that had not reported test results at that moment. Shortly after the deadline, the available test results were screened for suspect data. A test 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 reported test results (no reanalyzes). Additional or corrected test results are used for data analysis and the original test results are placed under 'Remarks' in the test result tables in appendix 1. Test results that came in after the deadline were not taken into account in this screening for suspect data and thus these participants were not requested for checks.

3.1 STATISTICS

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 Organisation, Statistics and Evaluation' of June 2018 (iis-protocol, version 3.5).
For the statistical evaluation the *unrounded* (when available) figures were used instead of the rounded test results. Test 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, a variant of the Kolmogorov-Smirnov test and by the calculation of skewness and kurtosis. Evaluation of the three normality indicators in

combination with the visual evaluation of the graphic Kernel density plot, lead to judgement of the normality being either ‘unknown’, ‘OK’, ‘suspect’ or ‘not OK’. After removal of outliers, this check was repeated. If a data set does not have a normal distribution, the (results of the) statistical evaluation should be used with due care.

According to ISO5725 the original test results per determination were submitted to Dixon’s, Grubbs' and/or Rosner’s outlier tests. Outliers are marked by D(0.01) for the Dixon’s test, by G(0.01) or DG(0.01) for the Grubbs’ test and by R(0.01) for the Rosner’s test. Stragglers are marked by D(0.05) for the Dixon’s test, by G(0.05) or DG(0.05) for the Grubbs’ test and by R(0.05) for the Rosner’s test. Both outliers and stragglers were not included in the calculations of averages and standard deviations.

For each assigned value, the uncertainty was determined in accordance with ISO13528. Subsequently the calculated uncertainty was evaluated against the respective requirement based on the target reproducibility in accordance with ISO13528. In this PT, the criterion of ISO13528, paragraph 9.2.1, was met for all evaluated tests, therefore, the uncertainty of all assigned values may be negligible and need not be included in the PT report.

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 test results are plotted. The corresponding laboratory numbers are on 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 reference test method. Outliers and other data, which were excluded from the calculations, are represented as a cross. Accepted data are represented as a triangle.

Furthermore, Kernel Density Graphs were made. This is a method for producing a smooth density approximation to a set of data that avoids some problems associated with histograms. Also, a normal Gauss curve was projected over the Kernel Density Graph for reference.

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. ISO or ASTM reproducibilities, the z-scores were calculated using a target standard deviation. This results in an evaluation independent of the variation in this interlaboratory study.

The target standard deviation was calculated from the literature reproducibility by division with 2.8. In case no literature reproducibility was available, other target values were used. In some cases, a reproducibility based on former iis proficiency tests could be used.

When a laboratory did use a test method with a reproducibility that is significantly different from the reproducibility of the reference test method used in this report, it is strongly advised to recalculate the z-score, while using the reproducibility of the actual test method used, this in order to evaluate whether the reported test result is fit-for-use.

The z-scores were calculated according to:

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

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

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

	|z|	< 1	good
1 <	|z|	< 2	satisfactory
2 <	|z|	< 3	questionable
3 <	|z|		unsatisfactory

4 EVALUATION

During the execution of this proficiency test some problems occurred with the dispatch of the samples. Six laboratories informed iis that they were not able to report test results in time due to the measures taken to contain the Covid-19 pandemic in their countries.
For the regular Biodiesel PT: five participants did not report any test results at all.
For the Metals in Biodiesel PT: two participants did not report any test results at all.
For the Total Contamination PT: three participants did not report any test results at all.
For the Cold Soak Test PT: three participants did not report any test results at all.

Finally, in total 47 participants reported in total 737 numerical results. Observed were 37 outlying results, which is 5.0%. In proficiency studies, outlier percentages of 3% - 7.5% are quite normal.

Not all original data sets proved to have a normal Gaussian distribution. These are referred to as “not OK” or “suspect”. The statistical evaluation of these data sets should be used with due care, see also paragraph 3.1.

4.1 EVALUATION PER SAMPLE AND PER TEST

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

In the iis PT reports, ASTM test methods are referred to with a number (e.g. D874) and an added designation for the year that the test method was adopted or revised (e.g. D874:13a). If applicable, a designation in parentheses is added to designate the year of reapproval (e.g. D874:13a (2018)). In the test results tables of appendix 1 only the test method number and year of adoption will be used.

Sample #20050

Acid Value: This determination was not problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in full agreement with the requirements of EN14104:03 and EN14214:12+A2:19.

Total Acid Number: This determination was not problematic. Two statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D664:18e2 method B.

Cloud Point: This determination was not problematic. Three statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D2500:17a and EN14214:12+A2:19.

CFPP: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of EN116:15 or EN14214:12+A2:19.

Carbon Residue on 100% FAME: This determination may not be problematic. Almost all reported results were near or below the application range of ASTM D4530:15 or ISO10370:14 (0.1%M/M). Therefore, no z-scores were calculated.

Copper Corrosion: This determination may not be problematic. All reporting participants agreed on a test result of 1(1a/1b).

Density at 15°C: This determination was not problematic. Four statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ISO12185:96.

Flash Point PMcc: This determination was not problematic. Two statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in full agreement with the requirements of ASTM D93-C:19 and ISO2719-C:16.

Flash Point recc: This determination was problematic. No statistical outliers were observed. However, the calculated reproducibility is not in agreement with the requirements of ISO3679:15.

Iodine Value: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of EN14111:03.

Kinematic Viscosity at 40°C: The determination was not problematic. Two statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in full agreement with the requirements of ISO3104:94 and ASTM D445:19a.

Oxidation Stability: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of EN15751:14.

Pour Point: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of ISO3016:19.

Sulfated Ash: This determination may not be problematic. All reported test results were near or below the application range of ASTM D874:13a(2018). Therefore, no z-scores were calculated.

Sulfur: This determination was not problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with the requirements of ISO20846:19 and with ASTM D5453:19a.

Water: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of ISO12937:00.

Water and Sediment: This determination may not be problematic. All reported test results were near or below the application range of ASTM D2709:16. Therefore, no z-scores were calculated.

Calorific Value: Five participants submitted a test result for Gross Calorific Value at constant volume and one participant for Net Calorific Value at constant volume. No participants reported a test result for Net Calorific Value at constant pressure.
The determination on Gross Calorific Value may not be problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with the requirements of DIN51900-1:00.

Distillation at 10 mmHg: This determination was not problematic for 80% and 90% recovered but problematic for 95% recovered. In total two statistical outliers were observed. The calculated reproducibilities after rejection of the statistical outliers are in agreement with the requirements of ASTM D1160:18 for 80% and 90% recovered but not for 95% recovered.

Methanol: This determination was problematic. No statistical outliers were observed. However, the calculated reproducibility is not in agreement with the requirements of EN14110:19.

Monoglycerides: This determination was not problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with the requirements of EN14105:11.

Diglycerides: This determination was problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is not in agreement with the requirements of EN14105:11.

Triglycerides: This determination was not problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with the requirements of EN14105:11.

Free Glycerol: This determination was not problematic. Two statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of EN14105:11.

Total Glycerol: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of EN14105:11.

Total Ester content (FAME): This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of EN14103:11.

Linolenic Acid Methyl Ester: This determination was not problematic. Three statistical outliers were observed. However, the calculated reproducibility after rejection of the statistical outliers is in full agreement with the requirements of EN14103:11.

Polyunsaturated Methyl Esters: This determination may not be problematic. All reported test results were near or below the application range of EN15779:09+A1:13. Therefore, no z-scores were calculated.

Sample #20051

Sum Ca + Mg: This determination was problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is not in agreement with the requirements of EN14538:06.

Phosphorus: This determination was problematic. Three statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is not in agreement with the requirements of EN14107:03.

Potassium: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of EN14109:03.

Sodium: This determination was problematic. No statistical outliers were observed. However, the calculated reproducibility is not in agreement with the requirements of EN14108:03.

Sum K + Na: This determination was problematic. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is not in agreement with the requirements of EN14538:06.

Sample #20052

Some years ago, there was some discussion about method EN12662 version 2014 for determining Total Contamination in Biodiesel (neat FAME or B100). The CEN/TC 19 working group published a letter in September 2015 (see lit. 17) about this issue. In short, for FAME blends (B100) either EN12662:1998 or EN12662:2008 should be used and not EN12662:14. Also, the latest version of EN14214:12+A2:19 (February 2019) states that EN12662 version 2008 should be used or EN12662:1998 as alternative. The method EN12662:14 is not mentioned anymore in the specification (see also iis memo 1903, lit 18). It was therefore decided to exclude the test results which were determined according EN12662:14.

Particulate Contamination: One laboratory reported a test result. Due to the low number of test results no significant conclusions were drawn.

Total Contamination: This determination was problematic. A known concentration of dust was added to the subsamples and therefore the minimum of total contamination to be determined was known (11.1 mg/kg =16.5 mg/kg – 5.4 mg/kg (R(EN14214:12+A2:19) at 16.5 mg/kg)). However, 3 laboratories reported a concentration lower than 11.1 mg/kg and these test results were excluded. Another seven test results were excluded because of reported to use version 2014 of EN12662 (see for more detail above). One statistical outlier was observed. The calculated reproducibility after rejection of the suspect data is still not in agreement with the requirements of EN12662:98 (or EN12662:08).

Sample #20053

Filter Blocking Potential by Cold Soak test: This determination was very problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is not in agreement with the requirements of D7501:18a.

Filter Blocking Tendency: This determination was problematic. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is not in agreement with the requirements of ASTM D2068-B:17.

4.2 PERFORMANCE EVALUATION FOR THE GROUP OF LABORATORIES

A comparison has been made between the reproducibility as declared by the relevant reference test method and the reproducibility as found for the group of participating laboratories. The number of significant test results, the average, the calculated reproducibility (2.8 * standard deviation) and the target reproducibility derived from literature reference test methods (e.g. ASTM, EN and ISO test methods) are presented in the next tables.

Parameter	unit	n	average	2.8 * sd	R(lit)
Acid Value	mg KOH/g	20	0.50	0.06	0.06
Total Acid Number	mg KOH/g	22	0.50	0.08	0.13
Cloud Point	°C	29	-6.7	2.9	5
Cold Filter Plugging Point (CFPP)	°C	32	-14.4	3.1	3.9
Carbon Residue (100% FAME)	%M/M	18	<0.1	n.a.	n.a.
Copper Corrosion, 3 hrs at 50°C		26	1 (1a/1b)	n.a.	n.a.
Density at 15°C	kg/m^3	39	883.7	0.3	0.5
Flash Point PMcc	°C	23	153.3	14.9	14.7
Flash Point recc	°C	6	168.8	20.3	15
Iodine Value	g I_2/100g	25	114.6	3.4	5
Kinematic Viscosity at 40°C	mm^2/s	34	4.463	0.046	0.045
Oxidation Stability Induction period	hours	22	2.6	0.6	0.9
Pour Point	°C	26	-38.4	5.4	9.0
Sulfated Ash	%M/M	21	<0.005	n.a.	n.a.
Sulfur	mg/kg	28	3.4	1.4	1.5
Water	mg/kg	41	490	87	152
Water and Sediment	%V/V	11	<0.05	n.a.	n.a.
Calorific Value, Gross	kJ/kg	4	39919	236	400
80% recovered, as AET	°C	4	352.4	1.5	4.6
90% recovered, as AET	°C	4	354.3	3.0	4.6
95% recovered, as AET	°C	4	360.1	5.5	4.6
Methanol	%M/M	21	0.039	0.013	0.012
Monoglycerides	%M/M	24	0.312	0.085	0.124
Diglycerides	%M/M	23	0.118	0.059	0.051
Triglycerides	%M/M	21	0.062	0.021	0.072
Free Glycerol	%M/M	21	0.003	0.006	0.007
Total Glycerol	%M/M	25	0.111	0.032	0.033
Total Ester content	%M/M	25	97.7	2.6	4.2
Linolenic Acid Methyl Ester	%M/M	17	9.89	0.69	0.67
Polyunsaturated Methyl Esters	%M/M	11	<0.6	n.a.	n.a.

Table 7: reproducibilities of tests on sample #20050

Parameter	unit	n	average	2.8 * sd	R(lit)
Sum Calcium and Magnesium	mg/kg	19	18.2	6.1	3.9
Phosphorus	mg/kg	16	11.6	3.2	2.3
Potassium	mg/kg	18	10.5	5.1	5.8
Sodium	mg/kg	19	9.3	7.0	3.8
Sum Potassium and Sodium	mg/kg	17	20.0	6.7	4.8
Particulate Contamination (D7321)	mg/L	1	n.a.	n.a.	n.a.
Total Contamination (EN12662)	mg/kg	15	19.8	7.8	6.0
Filter Blocking Potential (CSFT)	s	8	180.4	169.8	72.9
Filter Blocking Tendency (FBT)		11	5.9	2.8	2.2

Table 8: reproducibilities of tests on samples #20051, #20052 and #20053

Without further statistical calculations it can be concluded that for many tests there is a good compliance of the group of participating laboratories with the relevant reference test methods. The problematic tests have been discussed in paragraph 4.1.

4.3 COMPARISON OF THE PROFICIENCY TEST OF APRIL 2020 WITH PREVIOUS PTS

	April 2020	October 2019*)	May 2019	October 2018	May 2018
Type of FAME	Rapeseed	Rapeseed	Rapeseed	Rapeseed	Rapeseed
Number of reporting laboratories	47	67	45	83	39
Number of test results	737	1389	753	1332	563
Number of statistical outliers	37	40	30	33	22
Percentage of statistical outliers	5.0%	2.9%	4.0%	2.5%	3.9%

Table 9: comparison with previous proficiency tests (*) sample #20053 is a Soy Bean FAME)

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 reference test methods. The conclusions are given the following table.

Parameter	April 2020	October 2019	May 2019	October 2018	May 2018
Acid Value	+/-	+/-	-	-	-
Total Acid Number	+	+/-	+	+	+
Cloud Point	+	+	++	+	+
Cold Filter Plugging Point (CFPP)	+	+	+	-	+
Carbon Residue (100% FAME)	n.e.	n.e.	n.e.	n.e.	n.e.
Density at 15°C	+	++	+/-	++	+
Flash Point PMcc	+/-	+	+/-	-	-
Flash Point recc.	-	+	+	+	++
Iodine Value	+	-	+	+/-	-

Parameter	April 2020	October 2019	May 2019	October 2018	May 2018
Kinematic Viscosity at 40°C	+/-	+	-	-	-
Oxidation Stability Induction period	+	+	+	+	++
Pour Point	+	+	+	+	+
Sulfated Ash	n.e.	n.e.	n.e.	n.e.	n.e.
Sulfur	+/-	+/-	+/-	+	+
Water	+	+	+	+	+
Calorific Value, Gross	+	(--)	--	+	+
Distillation at 10 mmHg	+/-	+	+	-	-
Methanol	-	-	+/-	-	-
Monoglycerides	+	+	+	-	+
Diglycerides	-	+	+/-	+	+
Triglycerides	++	+	++	++	++
Free Glycerol	+	+	+	++	+
Total Glycerol	+/-	+/-	+/-	-	+
Total Ester content	+	+	+	+	+
Linolenic Acid Methyl Ester	+/-	+/-	+	+	+
Polyunsaturated Methyl Esters	n.e.	n.e.	+	+/-	-
Sum of Calcium and Magnesium	-	+	--	-	-
Phosphorus	-	-	-	-	-
Potassium	+	+	-	+/-	+
Sodium	--	+	--	-	-
Sum of Potassium and Sodium	-	-	--	--	-
Particle Contamination (D7321)	n.e.	n.e.	n.e.	n.e.	n.e.
Total Contamination ((EN12662)	-	--	--	-	--
Filter Blocking Potential (CSFT)	--	--	(--)	--	n.e.
Filter Blocking Tendency (FBT)	-	--	-	--	n.e.

Table 10: comparison of group performances against the reference test methods of all samples

Sign between brackets the calculated reproducibility is much higher than the reference test method.

The following performance categories were used:

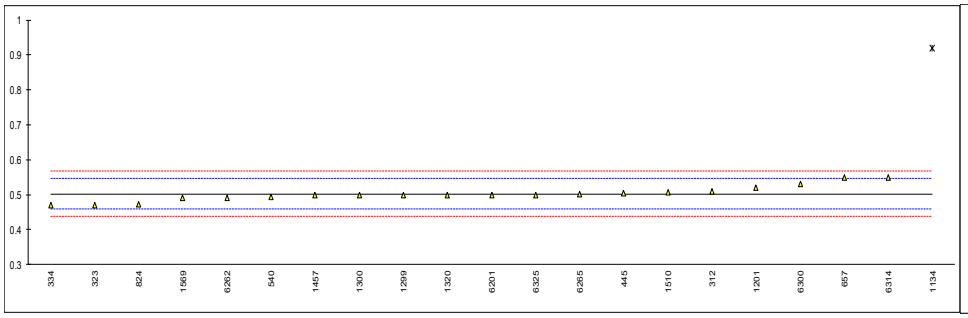
- ++: group performed much better than the reference test method
- + : group performed better than the reference test method
- +/-: group performance equals the reference test method
- - : group performed worse than the reference test method
- -- : group performed much worse than the reference test method
- n.e.: not evaluated

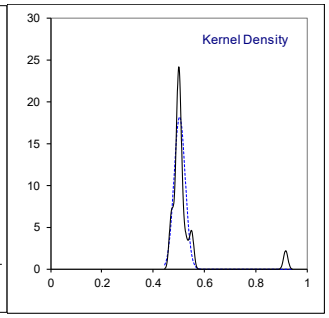
APPENDIX 1

Determination of Acid Value on sample #20050; results in mg KOH/g

lab	method	value	mark	z(targ)	remarks
150		-----		-----	
171		-----		-----	
312	EN14104	0.51		0.33	
323	EN14104	0.47		-1.53	
334	EN14104	0.47		-1.53	
335		-----		-----	
336		-----		-----	
396		-----		-----	
445	EN14104	0.503		0.01	
448		-----		-----	
511		-----		-----	
540	EN14104	0.493		-0.46	
551		-----		-----	
558		-----		-----	
621		-----		-----	
631		-----		-----	
657	EN14104	0.55		2.20	
824	EN14104	0.473		-1.39	
863		-----		-----	
1017		-----		-----	
1134	EN14104	0.919	R(0.01)	19.42	
1201	EN14104	0.52		0.80	
1213		-----		-----	
1299	EN14104	0.50		-0.13	
1300	EN14104	0.500		-0.13	
1316		-----		-----	
1320	EN14104	0.50		-0.13	
1399		-----		-----	
1457	EN14104	0.498		-0.23	
1459		-----		-----	
1494		-----		-----	
1510	EN14104	0.507		0.19	
1554		-----		-----	
1564		-----		-----	
1569	EN14104	0.49		-0.60	
1643		-----		-----	
1769		-----		-----	
1984		-----		-----	
6001		-----		-----	
6069		-----		-----	
6201	EN14104	0.50		-0.13	
6245		-----		-----	
6259		-----		-----	
6262	EN14104	0.49		-0.60	
6265	EN14104	0.5015		-0.06	
6300	EN14104	0.531		1.31	
6314	EN14104	0.55		2.20	
6325	EN14104	0.50		-0.13	

	normality	OK
	n	20
	outliers	1
	mean (n)	0.5028
	st.dev. (n)	0.02194
	R(calc.)	0.0614
	st.dev.(EN14104:03)	0.02143
	R(EN14104:03)	0.06
Compare		
	R(EN14214:12+A2:19)	0.06

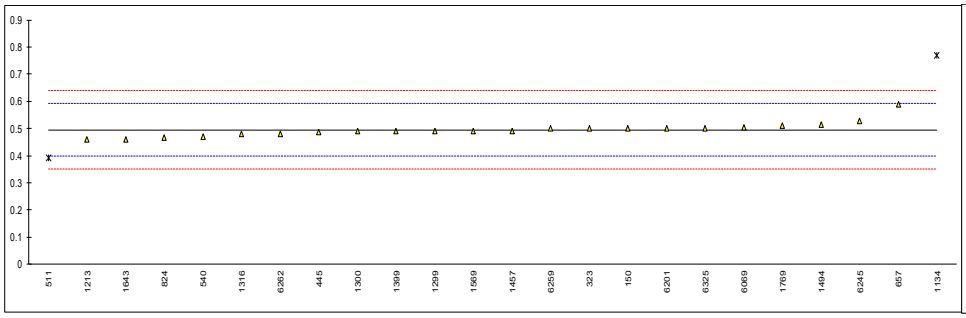


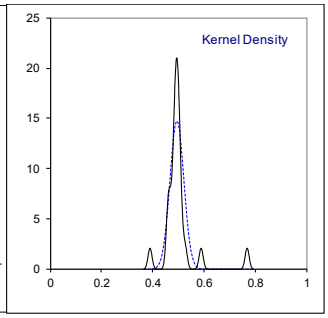


Determination of Total Acid Number on sample #20050; results in mg KOH/g

lab	method	value	mark	z(targ)	remarks
150	D664-B	0.50		0.10	
171	D664-B	<0.01		<-10.17	possibly a false negative test result?
312		-----		-----	
323	D664-B	0.50		0.10	
334		-----		-----	
335		-----		-----	
336		-----		-----	
396		-----		-----	
445	D664-B	0.488		-0.15	
448		-----		-----	
511	D974	0.39	R(0.05)	-2.21	
540	D664-B	0.470		-0.53	
551		-----		-----	
558		-----		-----	
621		-----		-----	
631		-----		-----	
657	D664-B	0.59		1.98	
824	D664-B	0.465		-0.63	
863		-----		-----	
1017		-----		-----	
1134	D664-B	0.77	R(0.01)	5.76	
1201		-----		-----	
1213	D664-B	0.46		-0.74	
1299	D664-B	0.49		-0.11	
1300	D664-B	0.489	C	-0.13	first reported 0.663
1316	D664-B	0.48		-0.32	
1320		-----		-----	
1399	D664-B	0.4897		-0.12	
1457	D664-B	0.491		-0.09	
1459		-----		-----	
1494	D664-B	0.5124		0.36	
1510		-----		-----	
1554		-----		-----	
1564		-----		-----	
1569	D664-B	0.49		-0.11	
1643	D664-A	0.460		-0.74	
1769	D664-B	0.51010		0.31	
1984		-----		-----	
6001		-----		-----	
6069	D664-B	0.5033		0.17	
6201	D664-B	0.50		0.10	
6245	EN14104	0.528		0.69	
6259	D664-B	0.4995		0.09	
6262	D664-B	0.48		-0.32	
6265		-----		-----	
6300		-----		-----	
6314		-----		-----	
6325	EN14104	0.50		0.10	

normality	not OK
n	22
outliers	2
mean (n)	0.4953
st.dev. (n)	0.02711
R(calc.)	0.0759
st.dev.(D664-B:18e2)	0.04773
R(D664-B:18e2)	0.1336

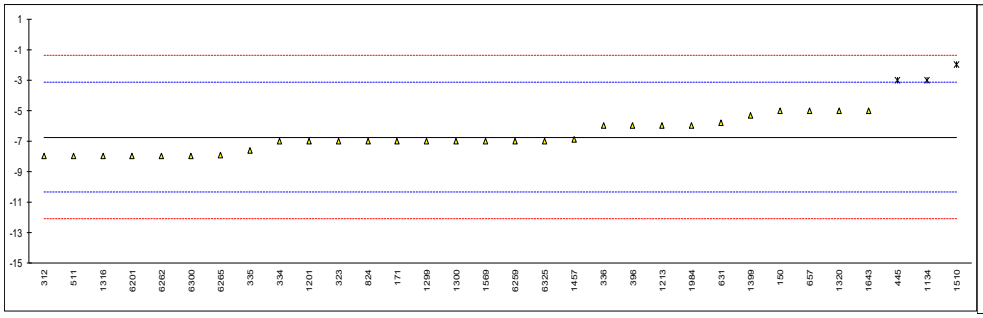


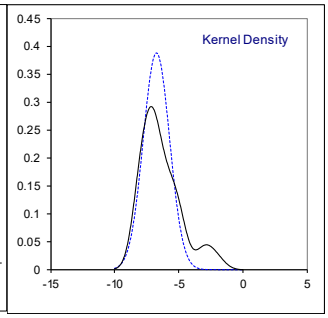


Determination of Cloud Point on sample #20050; results in °C

lab	method	value	mark	z(targ)	remarks
150	D2500	-5		0.98	
171	D2500	-7		-0.14	
312	D2500	-8		-0.70	
323	D2500	-7		-0.14	
334	D2500	-7		-0.14	
335	D2500	-7.6		-0.48	
336	D2500	-6		0.42	
396	D2500	-6		0.42	
445	D2500	-3	R(0.05)	2.10	
448		-----		-----	
511	D2500	-8		-0.70	
540	D2500	<-6		-----	
551		-----		-----	
558		-----		-----	
621		-----		-----	
631	D5773	-5.8		0.53	
657	D2500	-5		0.98	
824	D2500	-7		-0.14	
863		-----		-----	
1017		-----		-----	
1134	D2500	-3	R(0.05)	2.10	
1201	EN23015	-7		-0.14	
1213	D2500	-6	C	0.42	first reported 6
1299	D2500	-7		-0.14	
1300	D2500	-7		-0.14	
1316	EN23015	-8		-0.70	
1320	ISO3015	-5		0.98	
1399	D5773	-5.3		0.81	
1457	D2500	-6.9		-0.09	
1459		-----		-----	
1494		-----		-----	
1510	D2500	-2	R(0.05)	2.66	
1554		-----		-----	
1564		-----		-----	
1569	EN23015	-7		-0.14	
1643	D2500	-5		0.98	
1769		-----		-----	
1984	ISO3015	-6		0.42	
6001		-----		-----	
6069		-----		-----	
6201	D2500	-8		-0.70	
6245		-----		-----	
6259	D5771	-7		-0.14	
6262	EN23015	-8		-0.70	
6265	ISO3015	-7.9		-0.65	
6300	ISO3015	-8		-0.70	
6314		-----		-----	
6325	D2500	-7		-0.14	

	normality	OK
	n	29
	outliers	3
	mean (n)	-6.74
	st.dev. (n)	1.028
	R(calc.)	2.88
	st.dev.(D2500:17a)	1.786
	R(D2500:17a)	5
Compare		
	R(EN14214:12+A2:19)	4

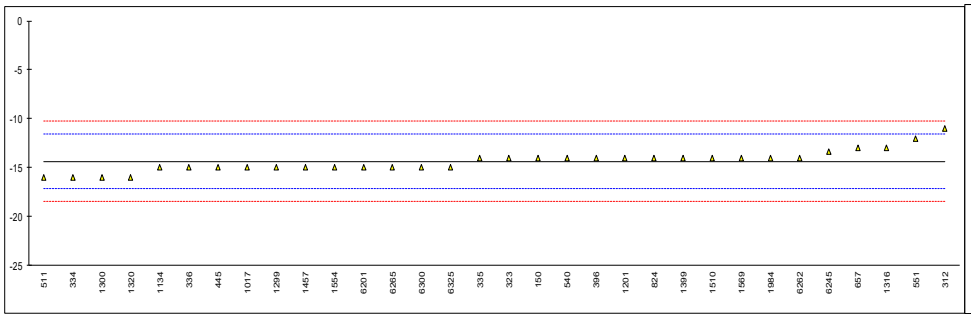


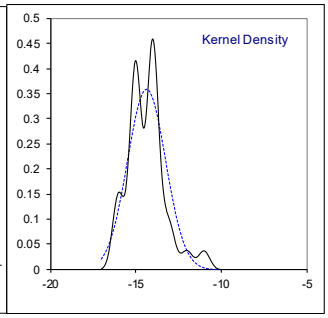


Determination of Cold Filter Plugging Point (CFPP) on sample #20050; results in °C

lab	method	value	mark	z(targ)	remarks
150	EN116	-14		0.26	
171		-----		-----	
312	D6371	-11		2.43	
323	EN116	-14		0.26	
334	EN116	-16		-1.19	
335	EN116	-14		0.26	
336	EN116	-15		-0.47	
396	EN116	-14		0.26	
445	EN116	-15		-0.47	
448		-----		-----	
511	D6371	-16		-1.19	
540	D6371	-14		0.26	
551	D6371	-12.0		1.71	
558		-----		-----	
621		-----		-----	
631		-----		-----	
657	IP309	-13.0		0.98	
824	EN116	-14		0.26	
863		-----		-----	
1017	EN116	-15		-0.47	
1134	IP309	-15		-0.47	
1201	EN116	-14		0.26	
1213		-----		-----	
1299	EN116	-15		-0.47	
1300	EN116	-16		-1.19	
1316	EN116	-13		0.98	
1320	EN116	-16		-1.19	
1399	IP309	-14.0		0.26	
1457	EN116	-15		-0.47	
1459		-----		-----	
1494		-----		-----	
1510	EN116	-14		0.26	
1554	EN116	-15		-0.47	
1564		-----		-----	
1569	EN116	-14		0.26	
1643		-----		-----	
1769		-----		-----	
1984	EN116	-14		0.26	
6001		-----		-----	
6069		-----		-----	
6201	EN116	-15		-0.47	
6245	EN116	-13.4		0.69	
6259		-----		-----	
6262	EN116	-14		0.26	
6265	EN116	-15		-0.47	
6300	EN116	-15		-0.47	
6314		-----		-----	
6325	EN116	-15		-0.47	

	normality	suspect
	n	32
	outliers	0
	mean (n)	-14.36
	st.dev. (n)	1.112
	R(calc.)	3.11
	st.dev.(EN116:15)	1.379
	R(EN116:15)	3.86
Compare		
	R(EN14214:12+A2:19)	3.86





Determination of Carbon Residue on 100% FAME on sample #20050; results in %M/M

lab	method	value	mark	z(targ)	remarks
150		-----		-----	
171	D4530	<0.10		-----	
312		-----		-----	
323	D4530	<0.10		-----	
334	D4530	0.01		-----	
335		-----		-----	
336		-----		-----	
396		-----		-----	
445	D4530	<0.01		-----	
448		-----		-----	
511	D189	0.013		-----	
540	D4530	<0.10		-----	
551	D4530	0.02		-----	
558		-----		-----	
621		-----		-----	
631	D4530	<0.1		-----	
657	D4530	<0.10		-----	
824	D4530	0.02		-----	
863		-----		-----	
1017		-----		-----	
1134	D4530	<0.01		-----	
1201		-----		-----	
1213	D4530	<0.1		-----	
1299		-----		-----	
1300	D4530	0.00931		-----	
1316	D4530	<0,1		-----	
1320		-----		-----	
1399		-----		-----	
1457	D4530	0.020		-----	
1459		-----		-----	
1494		-----		-----	
1510	D4530	0.035		-----	
1554		-----		-----	
1564		-----		-----	
1569		-----		-----	
1643		-----		-----	
1769		-----		-----	
1984		-----		-----	
6001		-----		-----	
6069		-----		-----	
6201	D4530	0.02		-----	
6245		-----		-----	
6259		-----		-----	
6262	D4530	0.01		-----	
6265		-----		-----	
6300		-----		-----	
6314		-----		-----	
6325		-----		-----	
	n	18			Application range D4530:15 0.1 – 0.3 %M/M
	mean (n)	<0.1			Application range ISO10370:14 0.10 – 30.0 %M/M

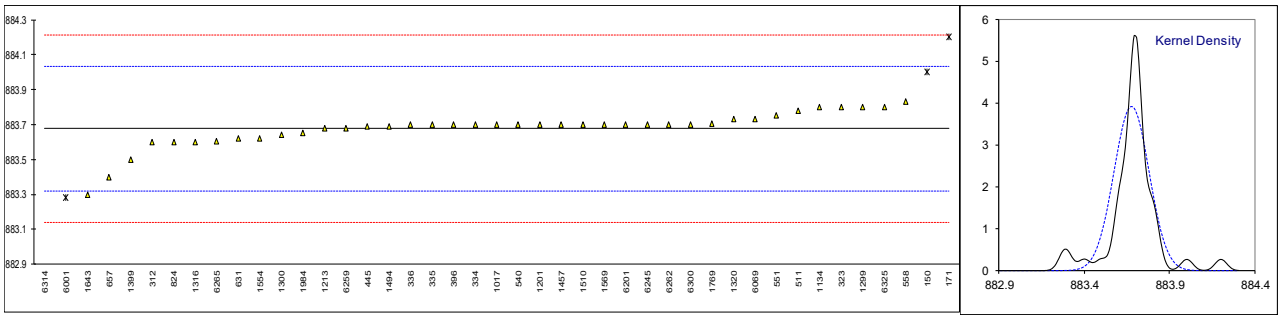
Determination of Copper Corrosion 3 hrs at 50°C on sample #20050

lab	method	value	mark	z(targ)	remarks
150	D130	1a		-----	
171	D130	1b		-----	
312	D130	1a		-----	
323	D130	1A		-----	
334	D130	1A		-----	
335	D130	1a		-----	
336	D130	1a		-----	
396		-----		-----	
445	D130	1a		-----	
448		-----		-----	
511	D130	1a		-----	
540	D130	1a		-----	
551	D130	1A		-----	
558		-----		-----	
621		-----		-----	
631	D130	1a		-----	
657	D130	1A		-----	
824	D130	1a		-----	
863		-----		-----	
1017		-----		-----	
1134	IP154	1a		-----	
1201	ISO2160	1A		-----	
1213		-----		-----	
1299	D130	1A		-----	
1300	ISO2160	1		-----	
1316	D130	1a		-----	
1320		-----		-----	
1399		-----		-----	
1457	D130	1A		-----	
1459		-----		-----	
1494		-----		-----	
1510	IP154	1a		-----	
1554	ISO2160	1a		-----	
1564		-----		-----	
1569	D130	1a		-----	
1643		-----		-----	
1769		-----		-----	
1984		-----		-----	
6001		-----		-----	
6069		-----		-----	
6201	D130	1a		-----	
6245		-----		-----	
6259		-----		-----	
6262	D130	1a		-----	
6265		-----		-----	
6300		-----		-----	
6314		-----		-----	
6325	D130	1a		-----	
	n	26			
	mean (n)	1(1a/1b)			

Determination of Density at 15°C on sample #20050; results in kg/m^3

lab	method	value	mark	z(targ)	remarks
150	ISO12185	884.0	R(0.05)	1.81	
171	D4052	884.2	R(0.01)	2.93	
312	D4052	883.6		-0.43	
323	ISO12185	883.8		0.69	
334	ISO12185	883.7		0.13	
335	ISO12185	883.7		0.13	
336	ISO12185	883.7		0.13	
396	ISO12185	883.7		0.13	
445	ISO12185	883.69		0.07	
448		-----		-----	
511	D4052	883.78		0.58	
540	D4052	883.7		0.13	
551	D4052	883.75		0.41	
558	D4052	883.83		0.86	
621		-----		-----	
631	D4052	883.62		-0.32	
657	D4052	883.4		-1.55	
824	ISO12185	883.6		-0.43	
863		-----		-----	
1017	D4052	883.7		0.13	
1134	ISO12185	883.8	C	0.69	reported 0.8838 kg/m^3
1201	ISO12185	883.7		0.13	
1213	D4052	883.68		0.02	
1299	D4052	883.8		0.69	
1300	ISO12185	883.64		-0.21	
1316	ISO12185	883.6		-0.43	
1320	ISO12185	883.73		0.30	
1399	D4052	883.5		-0.99	
1457	ISO12185	883.7		0.13	
1459		-----		-----	
1494	D4052	883.69		0.07	
1510	ISO12185	883.7		0.13	
1554	ISO12185	883.62		-0.32	
1564		-----		-----	
1569	ISO12185	883.7		0.13	
1643	D4052	883.3		-2.11	
1769	D4052	883.704		0.15	
1984	ISO12185	883.65		-0.15	
6001	ISO3675	883.28	C,R(0.05)	-2.22	first reported 882.28
6069	D4052	883.730		0.30	
6201	ISO12185	883.7		0.13	
6245	ISO12185	883.70		0.13	
6259	D4052	883.68		0.02	
6262	ISO12185	883.7		0.13	
6265	ISO12185	883.605	C	-0.40	first reported 0.883605 no unit
6300	ISO12185	883.7		0.13	
6314	D1298	880.4	C,R(0.01)	-18.35	first reported 0.882 kg/L
6325	ISO12185	883.8		0.69	

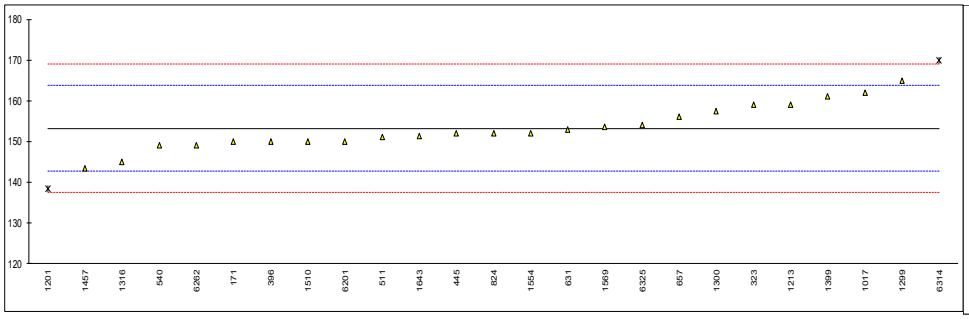
normality	not OK
n	39
outliers	4
mean (n)	883.68
st.dev. (n)	0.102
R(calc.)	0.29
st.dev.(ISO12185:96)	0.179
R(ISO12185:96)	0.5

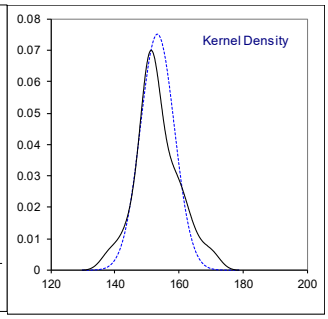


Determination of Flash Point PMcc on sample #20050; results in °C

lab	method	value	mark	z(targ)	remarks
150	D93-C	>130.0		-----	
171	D93-C	150		-0.62	
312		-----		-----	
323	D93-C	159.0		1.09	
334		-----		-----	
335		-----		-----	
336		-----		-----	
396	D93-C	150		-0.62	
445	D93-C	152.0		-0.24	
448		-----		-----	
511	D93-C	151		-0.43	
540	D93-C	149.00		-0.81	
551		-----		-----	
558		-----		-----	
621		-----		-----	
631	D93-A	153.0		-0.05	
657	D93-C	156		0.52	
824	D93-C	152.0		-0.24	
863		-----		-----	
1017	D93-A	162		1.67	
1134		-----		-----	
1201	D93-C	138.5	R(0.01)	-2.81	
1213	D93-C	159		1.09	
1299	D93-C	165.0		2.24	
1300	D93-C	157.5		0.81	
1316	D93-C	145.0		-1.57	
1320		-----		-----	
1399	D93-A	161		1.48	
1457	D93-C	143.5		-1.86	
1459		-----		-----	
1494		-----		-----	
1510	D93-A	150.0		-0.62	
1554	ISO2719-C	152.0		-0.24	
1564		-----		-----	
1569	ISO2719-C	153.5		0.05	
1643	D93-C	151.3		-0.37	
1769		-----		-----	
1984		-----		-----	
6001		-----		-----	
6069		-----		-----	
6201	D93-C	150		-0.62	
6245		-----		-----	
6259		-----		-----	
6262	ISO2719-C	149.0		-0.81	
6265		-----		-----	
6300		-----		-----	
6314	D93-C	170	C,R(0.01)	3.19	first reported 190
6325	D93-C	154.0		0.14	

	normality	OK
	n	23
	outliers	2
	mean (n)	153.25
	st.dev. (n)	5.318
	R(calc.)	14.89
	st.dev.(D93-C:19)	5.250
	R(D93-C:19)	14.7
Compare		
	R(ISO2719-C:16)	14.7

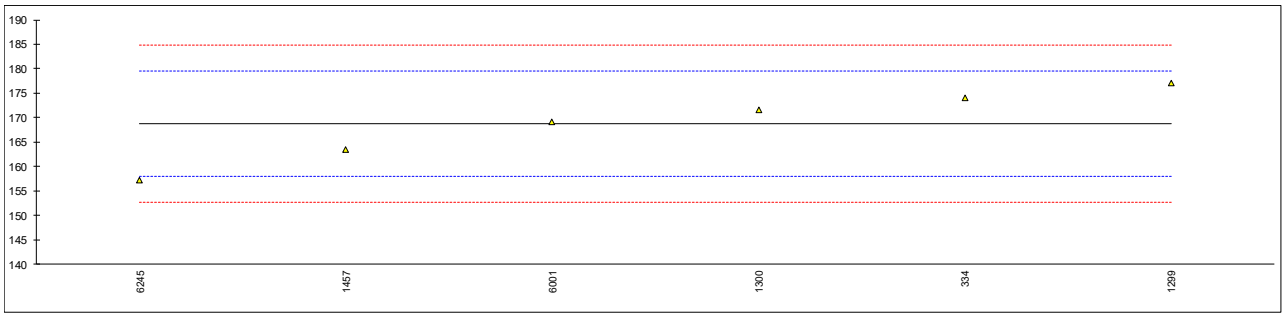




Determination of Flash Point recc on sample #20050; results in °C

lab	method	value	mark	z(targ)	remarks
150		-----		-----	
171		-----		-----	
312		-----		-----	
323		-----		-----	
334	ISO3679	174.0		0.98	
335		-----		-----	
336		-----		-----	
396		-----		-----	
445		-----		-----	
448		-----		-----	
511		-----		-----	
540		-----		-----	
551		-----		-----	
558		-----		-----	
621		-----		-----	
631		-----		-----	
657		-----		-----	
824		-----		-----	
863		-----		-----	
1017		-----		-----	
1134		-----		-----	
1201		-----		-----	
1213		-----		-----	
1299	ISO3679	177.0		1.54	
1300	ISO3679	171.5		0.51	
1316		-----		-----	
1320		-----		-----	
1399		-----		-----	
1457	ISO3679	163.5		-0.98	
1459		-----		-----	
1494		-----		-----	
1510		-----		-----	
1554		-----		-----	
1564		-----		-----	
1569		-----		-----	
1643		-----		-----	
1769		-----		-----	
1984		-----		-----	
6001	ISO3679	169.2		0.08	
6069		-----		-----	
6201		-----		-----	
6245	ISO3679	157.3		-2.14	
6259		-----		-----	
6262		-----		-----	
6265		-----		-----	
6300		-----		-----	
6314		-----		-----	
6325		-----		-----	

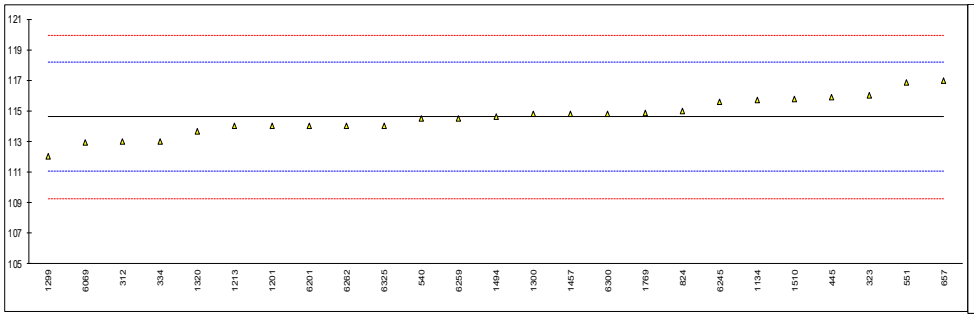
normality	unknown
n	6
outliers	0
mean (n)	168.75
st.dev. (n)	7.240
R(calc.)	20.27
st.dev.(ISO3679:15)	5.357
R(ISO3679:15)	15

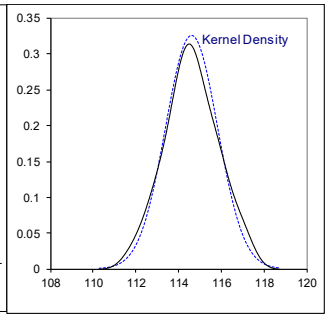


Determination of Iodine Value on sample #20050; results in g I_2/100g

lab	method	value	mark	z(targ)	remarks
150		-----		-----	
171		-----		-----	
312	EN14111	113	C	-0.90	first reported 121
323	EN14111	116		0.78	
334	EN14111	113	C	-0.90	first reported 109
335		-----		-----	
336		-----		-----	
396		-----		-----	
445	EN14111	115.9		0.72	
448		-----		-----	
511		-----		-----	
540	EN14111	114.5		-0.06	
551	EN14111	116.835		1.25	
558		-----		-----	
621		-----		-----	
631		-----		-----	
657	EN14111	117		1.34	
824	EN14111	115.0		0.22	
863		-----		-----	
1017		-----		-----	
1134	EN14111	115.7		0.61	
1201	EN14111	114		-0.34	
1213	EN14111	114	C	-0.34	first reported 111
1299	EN14111	112		-1.46	
1300	EN14111	114.8		0.11	
1316		-----		-----	
1320	EN14111	113.63		-0.55	
1399		-----		-----	
1457	EN14111	114.8		0.11	
1459		-----		-----	
1494	EN14111	114.62		0.00	
1510	EN14111	115.8		0.67	
1554		-----		-----	
1564		-----		-----	
1569		-----		-----	
1643		-----		-----	
1769	EN14111	114.877		0.15	
1984		-----		-----	
6001		-----		-----	
6069	EN14111	112.902		-0.96	
6201	EN14111	114		-0.34	
6245	EN14111	115.6		0.55	
6259	EN14111	114.53		-0.05	
6262	EN14111	114		-0.34	
6265		-----		-----	
6300	EN14111	114.8		0.11	
6314		-----		-----	
6325	EN14111	114		-0.34	

normality	OK
n	25
outliers	0
mean (n)	114.61
st.dev. (n)	1.224
R(calc.)	3.43
st.dev.(EN14111:03)	1.786
R(EN14111:03)	5

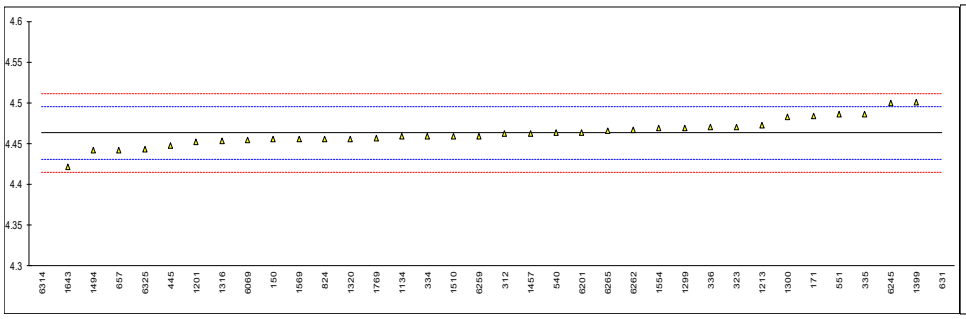


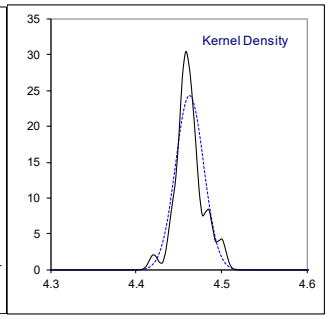


Determination of Kinematic Viscosity at 40°C on sample #20050; results in mm^2/s

lab	method	value	mark	z(targ)	remarks
150	ISO3104	4.455		-0.50	
171	D445	4.484		1.31	
312	D445	4.462		-0.06	
323	ISO3104	4.470		0.44	
334	D445	4.459		-0.25	
335	D445	4.486		1.44	
336	ISO3104	4.470		0.44	
396		-----		-----	
445	D445	4.4479		-0.94	
448		-----		-----	
511		-----		-----	
540	D445	4.463	C	0.00	first reported 3.9076
551	D445	4.4858		1.43	
558		-----		-----	
621		-----		-----	
631	D445	5.187	C,R(0.01)	45.25	first reported 4.9449
657	D445	4.442		-1.31	
824	ISO3104	4.456		-0.44	
863		-----		-----	
1017		-----		-----	
1134	ISO3104	4.4586		-0.27	
1201	ISO3104	4.452		-0.69	
1213	D445	4.472		0.56	
1299	D445	4.469		0.38	
1300	ISO3104	4.4831		1.26	
1316	ISO3104	4.453		-0.62	
1320	ISO3104	4.456		-0.44	
1399	D7042	4.5010		2.38	
1457	ISO3104	4.462		-0.06	
1459		-----		-----	
1494	D445	4.4419		-1.32	
1510	ISO3104	4.459		-0.25	
1554	ISO3104	4.4686		0.35	
1564		-----		-----	
1569	ISO3104	4.455		-0.50	
1643	D445	4.421		-2.62	
1769	D445	4.4570		-0.37	
1984		-----		-----	
6001		-----		-----	
6069	D445	4.4538		-0.57	
6201	ISO3104	4.463		0.00	
6245	ISO3104	4.4998		2.30	
6259	D445	4.459		-0.25	
6262	D445	4.467		0.25	
6265	EN16896	4.4658		0.18	
6300		-----		-----	
6314	D445	4.23	C,R(0.01)	-14.56	first reported 4.34
6325	ISO3104	4.443		-1.25	

			Only ISO3104	OnlyD445
	normality	suspect	not OK	OK
	n	34	17	16
	outliers	2	0	2
	mean (n)	4.4630	4.4641	4.4607
	st.dev. (n)	0.01640	0.01430	0.01745
	R(calc.)	0.0459	0.0400	0.0489
	st.dev.(ISO3104:94)	0.01600	0.01600	0.01600
	R(ISO3104:94)	0.0448	0.0448	---
Compare				
	R(D445:19a)	0.0544	---	0.0544

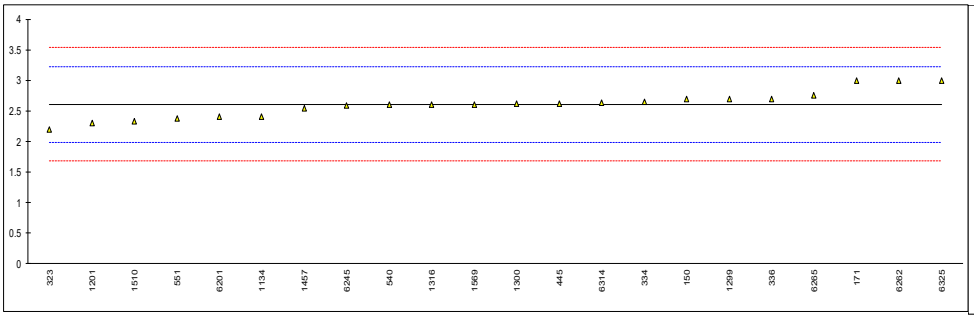


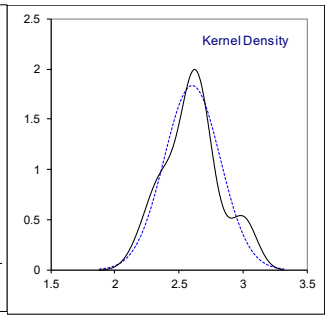


Determination of Oxidation Stability Induction period on sample #20050; results in hours

lab	method	value	mark	z(targ)	remarks
150	EN15751	2.7		0.31	
171	EN15751	3		1.27	
312		-----		-----	
323	EN15751	2.2		-1.30	
334	EN15751	2.65		0.15	
335		-----		-----	
336	EN15751	2.7		0.31	
396		-----		-----	
445	EN14112	2.62		0.05	
448		-----		-----	
511		-----		-----	
540	EN14112	2.60		-0.02	
551	EN14112	2.38		-0.72	
558		-----		-----	
621		-----		-----	
631		-----		-----	
657		-----		-----	
824		-----		-----	
863		-----		-----	
1017		-----		-----	
1134	EN15751	2.41		-0.63	
1201	EN14112	2.3		-0.98	
1213		-----		-----	
1299	EN15751	2.7		0.31	
1300	EN15751	2.61		0.02	
1316	EN14112	2.6		-0.02	
1320		-----		-----	
1399		-----		-----	
1457	EN14112	2.54		-0.21	
1459		-----		-----	
1494		-----		-----	
1510	EN15751	2.33		-0.89	
1554		-----		-----	
1564		-----		-----	
1569	EN15751	2.6		-0.02	
1643		-----		-----	
1769		-----		-----	
1984		-----		-----	
6001		-----		-----	
6069		-----		-----	
6201	EN14112	2.4		-0.66	
6245	EN14112	2.58		-0.08	
6259		-----		-----	
6262	EN15751	3.0		1.27	
6265	EN15751	2.76		0.50	
6300		-----		-----	
6314	EN14112	2.625		0.07	
6325	EN15751	3.0		1.27	

normality	OK
n	22
outliers	0
mean (n)	2.605
st.dev. (n)	0.2171
R(calc.)	0.608
st.dev.(EN15751:14)	0.3102
R(EN15751:14)	0.869

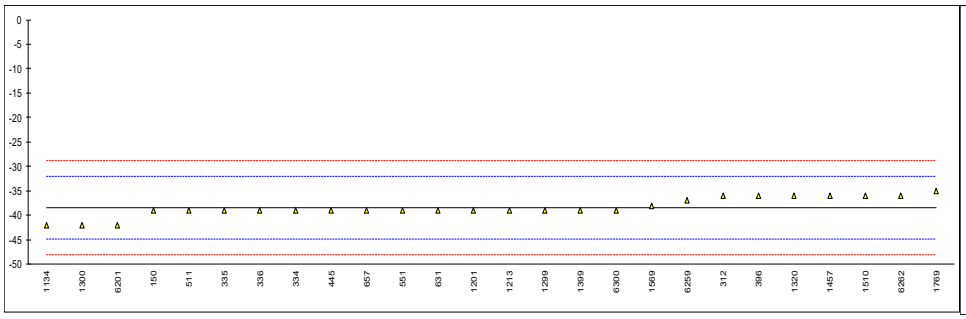


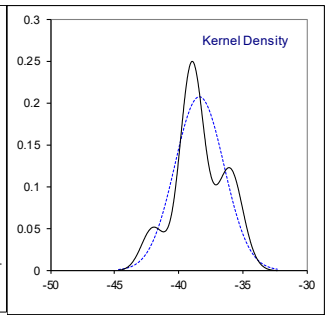


Determination of Pour Point on sample #20050; results in °C

lab	method	value	mark	z(targ)	remarks
150	ISO3016	-39		-0.19	
171		-----		-----	
312	D5950	-36		0.74	
323		-----		-----	
334	ISO3016	-39		-0.19	
335	ISO3016	-39		-0.19	
336	ISO3016	-39		-0.19	
396	ISO3016	-36		0.74	
445	D97	-39		-0.19	
448		-----		-----	
511	D97	-39		-0.19	
540	D5950	<-39		-----	
551	D5950	-39.0		-0.19	
558		-----		-----	
621		-----		-----	
631	D5950	-39		-0.19	
657	D97	-39		-0.19	
824	ISO3016	<-39		-----	
863		-----		-----	
1017		-----		-----	
1134	ISO3016	-42		-1.12	
1201	ISO3016	-39		-0.19	
1213	D97	-39		-0.19	
1299	D97	-39		-0.19	
1300	ISO3016	-42		-1.12	
1316		-----		-----	
1320	ISO3016	-36		0.74	
1399	D97	-39		-0.19	
1457	ISO3016	-36		0.74	
1459		-----		-----	
1494		-----		-----	
1510	D97	-36		0.74	
1554		-----		-----	
1564		-----		-----	
1569	D97	-38		0.12	
1643		-----		-----	
1769	D5950	-35		1.05	
1984		-----		-----	
6001		-----		-----	
6069		-----		-----	
6201	ISO3016	-42		-1.12	
6245		-----		-----	
6259	D5950	-37		0.43	
6262	D5950	-36		0.74	
6265		-----		-----	
6300	ISO3016	-39		-0.19	
6314		-----		-----	
6325	D97	<-24		-----	

normality	OK
n	26
outliers	0
mean (n)	-38.4
st.dev. (n)	1.92
R(calc.)	5.376
st.dev.(ISO3016:19)	3.21
R(ISO3016:19)	9.0



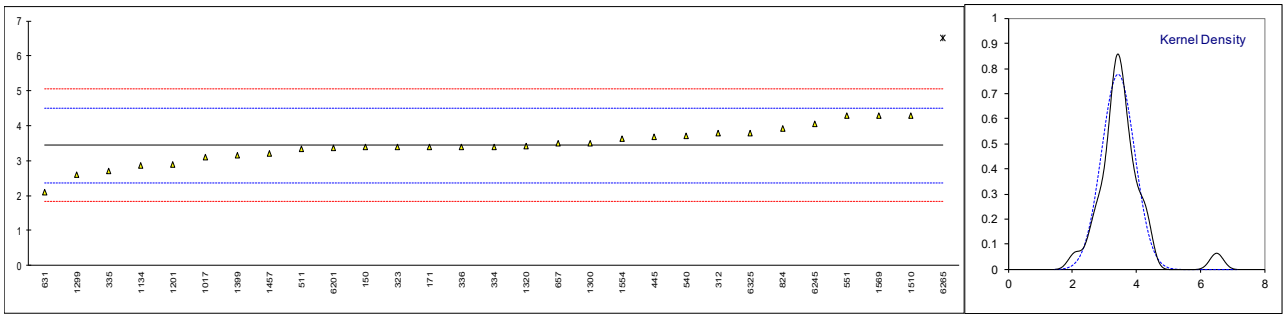


Determination of Sulfated Ash on sample #20050; results in %M/M

lab	method	value	mark	z(targ)	remarks
150	D874	<0.005		-----	
171	D874	<0.005		-----	
312		-----		-----	
323	D874	<0.001		-----	
334	D874	0.004		-----	
335		-----		-----	
336		-----		-----	
396		-----		-----	
445	D874	<0.005		-----	
448		-----		-----	
511	D874	0		-----	
540	ISO3987	<0.005		-----	
551	D874	0.001		-----	
558		-----		-----	
621		-----		-----	
631	D874	<0.005		-----	
657	D874	<0.005		-----	
824	D874	0.001		-----	
863		-----		-----	
1017		-----		-----	
1134	ISO3987	<0.001		-----	
1201	ISO3987	0		-----	
1213	D874	Not detected		-----	
1299	ISO3987	<0.0005		-----	
1300	D874	0.0045		-----	
1316		-----		-----	
1320	ISO3987	0.0006		-----	
1399		-----		-----	
1457		-----		-----	
1459		-----		-----	
1494		-----		-----	
1510	D874	0.001		-----	
1554		-----		-----	
1564		-----		-----	
1569	D874	<0,005		-----	
1643		-----		-----	
1769		-----		-----	
1984		-----		-----	
6001		-----		-----	
6069		-----		-----	
6201	D874	<0.0005		-----	
6245		-----		-----	
6259		-----		-----	
6262	D874	<0.005		-----	
6265		-----		-----	
6300		-----		-----	
6314		-----		-----	
6325	ISO3987	0.001		-----	
	n	21			
	mean (n)	<0.005			

Determination of Sulfur on sample #20050; results in mg/kg

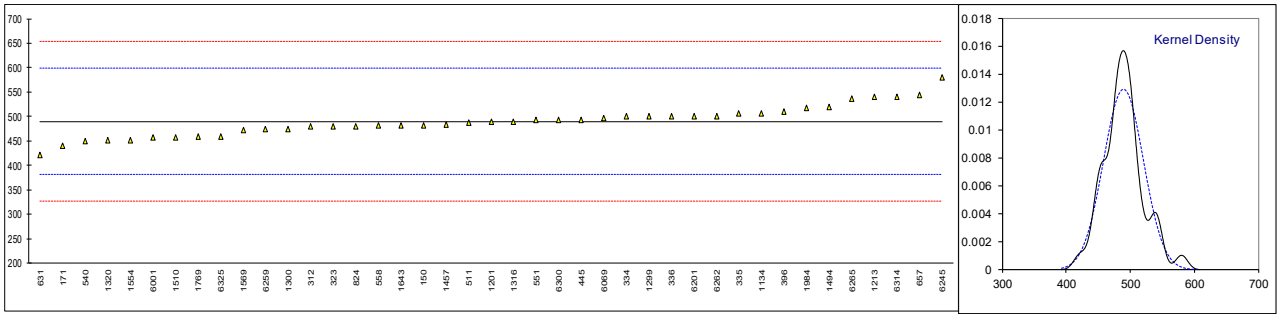
lab	method	value	mark	z(targ)	remarks
150	ISO20846	3.4		-0.07	
171	D5453	3.4		-0.07	
312	ISO20846	3.8		0.68	
323	ISO20846	3.4		-0.07	
334	ISO20846	3.4		-0.07	
335	ISO20846	2.71		-1.35	
336	ISO20846	3.4		-0.07	
396		-----		-----	
445	ISO20846	3.68		0.46	
448		-----		-----	
511	D5453	3.33		-0.20	
540	D5453	3.70		0.49	
551	D5453	4.289		1.59	
558		-----		-----	
621		-----		-----	
631	D7039	2.1		-2.48	
657	D5453	3.499		0.12	
824	ISO20846	3.92		0.90	
863		-----		-----	
1017	ISO20846	3.1		-0.62	
1134	IP490	2.87		-1.05	
1201	ISO20846	2.9		-1.00	
1213		-----		-----	
1299	ISO20884	2.6		-1.55	
1300	ISO20846	3.5		0.12	
1316		-----		-----	
1320	ISO20846	3.41		-0.05	
1399	D5453	3.165		-0.50	
1457	ISO20846	3.2		-0.44	
1459		-----		-----	
1494		-----		-----	
1510	ISO20846	4.3		1.61	
1554	ISO20846	3.62		0.34	
1564		-----		-----	
1569	ISO20846	4.29		1.59	
1643		-----		-----	
1769		-----		-----	
1984		-----		-----	
6001		-----		-----	
6069		-----		-----	
6201	ISO20846	3.36		-0.14	
6245	ISO20846	4.04		1.13	
6259		-----		-----	
6262		-----	W	-----	test result withdrawn. first reported 7.5
6265	ISO13032	6.5	R(0.01)	5.70	
6300		-----		-----	
6314		-----		-----	
6325	ISO20846	3.8		0.68	
	normality	OK			
	n	28			
	outliers	1			
	mean (n)	3.435			
	st.dev. (n)	0.5136			
	R(calc.)	1.438			
	st.dev.(ISO20846:19)	0.5374			
	R(ISO20846:19)	1.505			Application range: 3 – 500 mg.kg
Compare					
	R(D5453:19a)	1.463			Application range: 1 – 8000 mg/kg



Determination of Water on sample #20050; results in mg/kg

lab	method	value	mark	z(targ)	remarks
150	ISO12937	482		-0.14	
171	D6304-A	441		-0.90	
312	ISO12937	480		-0.18	
323	ISO12937	480		-0.18	
334	ISO12937	500		0.19	
335	ISO12937	505.7		0.29	
336	ISO12937	500		0.19	
396	ISO12937	510		0.37	
445	ISO12937	493.7		0.07	
448		-----		-----	
511	D6304-A	486.6		-0.06	
540	ISO12937	450.0		-0.73	
551	D6304-A	493		0.06	
558	D6304-A	481		-0.16	
621		-----		-----	
631	D6304-B	422		-1.25	
657	D6304-A	545.05		1.02	
824	ISO12937	480		-0.18	
863		-----		-----	
1017		-----		-----	
1134	ISO12937	507		0.32	
1201	ISO12937	490		0.00	
1213	D6304-A	540		0.92	
1299	ISO12937	500		0.19	
1300	ISO12937	475		-0.27	
1316	ISO12937	490		0.00	
1320	ISO12937	451		-0.72	
1399		-----	W	-----	test result withdrawn. first reported 8
1457	ISO12937	484		-0.11	
1459		-----		-----	
1494	E203	519.34		0.54	
1510	ISO12937	458		-0.59	
1554	ISO12937	451.64		-0.70	
1564		-----		-----	
1569	D6304-C	473		-0.31	
1643	ISO6296	481		-0.16	
1769	ISO12937	459.670		-0.56	
1984	ISO12937	518.5		0.53	
6001	ISO760	457.16		-0.60	
6069	ISO12937	496.8		0.13	
6201	ISO12937	500		0.19	
6245	ISO12937	580.0		1.66	
6259	ISO12937	473.635		-0.30	
6262	ISO12937	500		0.19	
6265	In house	536		0.85	
6300	ISO12937	493		0.06	
6314	D4928	540		0.92	
6325	ISO12937	460		-0.55	

normality	OK
n	41
outliers	0
mean (n)	489.87
st.dev. (n)	30.955
R(calc.)	86.67
st.dev.(ISO12937:00)	54.360
R(ISO12937:00)	152.21



Determination of Water and Sediment on sample #20050; results in %V/V

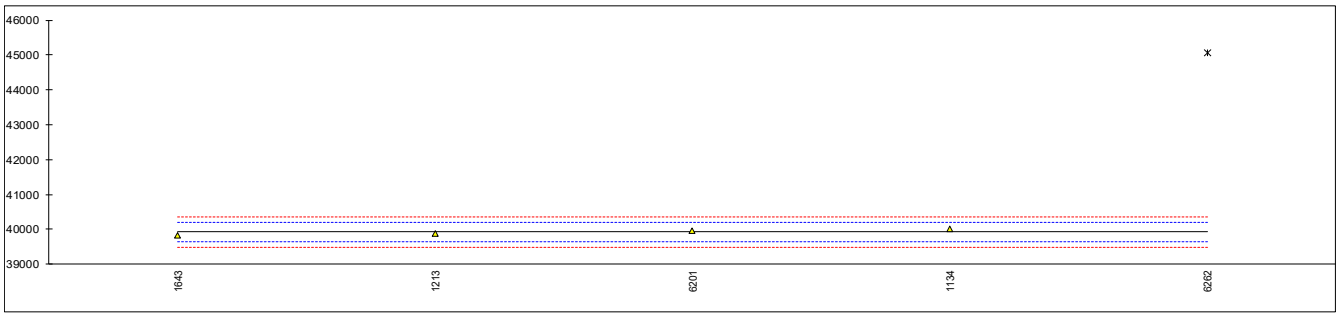
lab	method	value	mark	z(targ)	remarks
150		-----		-----	
171		-----		-----	
312		-----		-----	
323	D2709	<0.01		-----	
334		-----		-----	
335		-----		-----	
336		-----		-----	
396		-----		-----	
445	D2709	<0.01		-----	
448		-----		-----	
511	D2709	0		-----	
540	D2709	<0.05		-----	
551	D2709	<0.025		-----	
558		-----		-----	
621		-----		-----	
631	D2709	<0.01		-----	
657	D2709	<0.01		-----	
824	D2709	<0.01		-----	
863		-----		-----	
1017		-----		-----	
1134		-----		-----	
1201		-----		-----	
1213	D2709	<0.01		-----	
1299		-----		-----	
1300	D2709	<0.05		-----	
1316		-----		-----	
1320		-----		-----	
1399		-----		-----	
1457		-----		-----	
1459		-----		-----	
1494		-----		-----	
1510		-----		-----	
1554		-----		-----	
1564		-----		-----	
1569		-----		-----	
1643		-----		-----	
1769		-----		-----	
1984		-----		-----	
6001		-----		-----	
6069		-----		-----	
6201	D2709	0.05		-----	
6245		-----		-----	
6259		-----		-----	
6262		-----		-----	
6265		-----		-----	
6300		-----		-----	
6314		-----		-----	
6325		-----		-----	
	n	11			
	mean (n)	<0.05			

Determination of Calorific Value (Gross and Net) on sample #20050; results in kJ/kg

lab	method	Gross at const, vol.	mark	z(targ)	Net at const. vol.	Net at const. press
150		-----		-----	-----	-----
171		-----		-----	-----	-----
312		-----		-----	-----	-----
323		-----		-----	-----	-----
334		-----		-----	-----	-----
335		-----		-----	-----	-----
336		-----		-----	-----	-----
396		-----		-----	-----	-----
445		-----		-----	-----	-----
448		-----		-----	-----	-----
511		-----		-----	-----	-----
540		-----		-----	-----	-----
551		-----		-----	-----	-----
558		-----		-----	-----	-----
621		-----		-----	-----	-----
631		-----		-----	-----	-----
657		-----		-----	-----	-----
824		-----		-----	-----	-----
863		-----		-----	-----	-----
1017		-----		-----	-----	-----
1134	D240	40013		0.66	-----	-----
1201		-----		-----	-----	-----
1213		39880		-0.27	-----	-----
1299		-----		-----	-----	-----
1300		-----		-----	-----	-----
1316		-----		-----	-----	-----
1320		-----		-----	-----	-----
1399		-----		-----	-----	-----
1457		-----		-----	-----	-----
1459		-----		-----	-----	-----
1494		-----		-----	-----	-----
1510		-----		-----	-----	-----
1554		-----		-----	-----	-----
1564		-----		-----	-----	-----
1569		-----		-----	-----	-----
1643	D240	39823		-0.67	37256	-----
1769		-----		-----	-----	-----
1984		-----		-----	-----	-----
6001		-----		-----	-----	-----
6069		-----		-----	-----	-----
6201	DIN51900-1	39961	C	0.29	-----	-----
6245		-----		-----	-----	-----
6259		-----		-----	-----	-----
6262	DIN51900-3	45055	C,G(0.01)	35.95	-----	-----
6265		-----		-----	-----	-----
6300		-----		-----	-----	-----
6314		-----		-----	-----	-----
6325		-----		-----	-----	-----

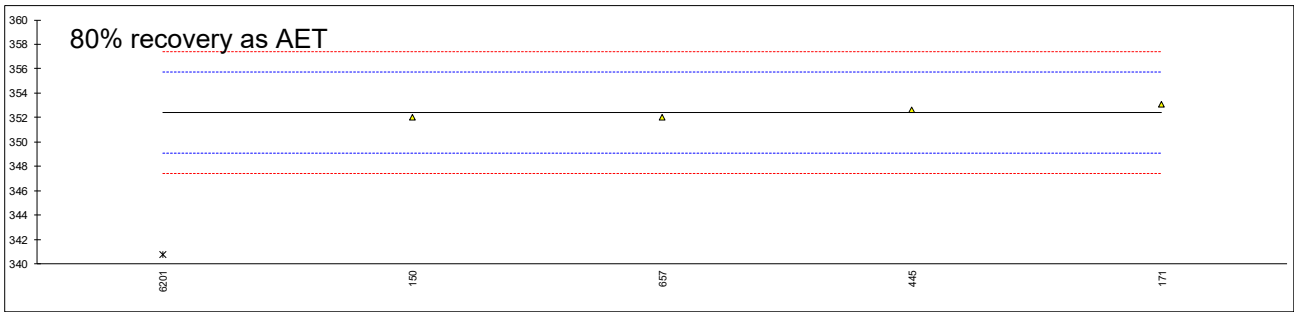
normality	unknown
n	4
outliers	1
mean (n)	39919
st.dev. (n)	84.3
R(calc.)	236
st.dev.(DIN51900-1:00)	142.9
R(DIN51900-1:00)	400

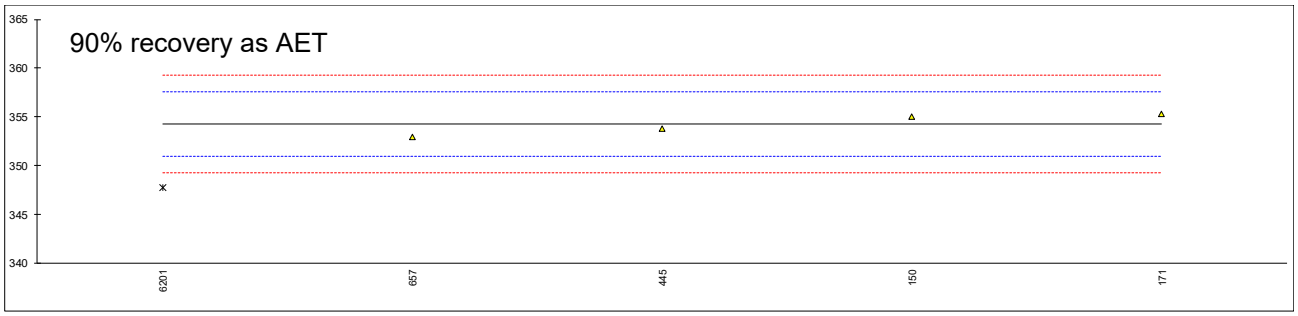
Lab 6201 first reported 39.961 kJ/kg
Lab 6262 first reported 45.055 kJ/kg

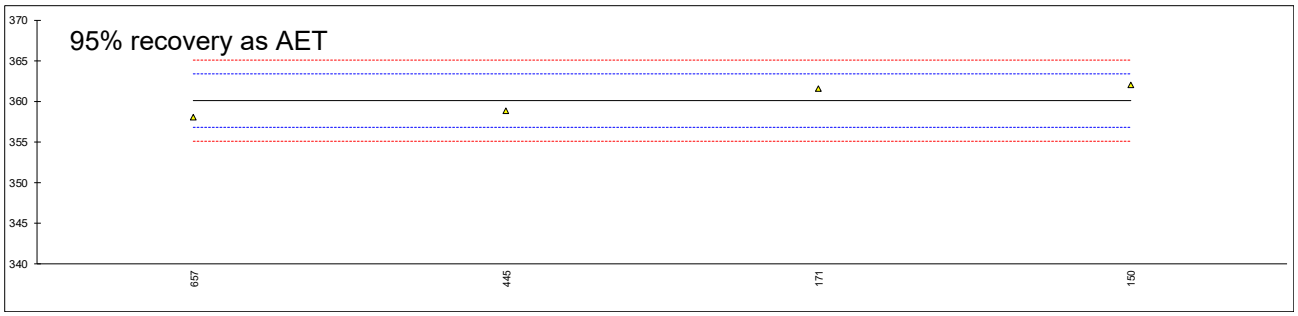


Determination of Distillation at 10 mmHg, % recovered as AET on sample #20050; results in °C

lab	method	80%rec.	mark	z(targ)	90%rec.	mark	z(targ)	95%rec.	mark	z(targ)
150	D1160	352		-0.26	355		0.44	362		1.16
171	D1160	353.1		0.41	355.3		0.62	361.5		0.86
312		-----		-----	-----		-----	-----		-----
323		-----		-----	-----		-----	-----		-----
334		-----		-----	-----		-----	-----		-----
335		-----		-----	-----		-----	-----		-----
336		-----		-----	-----		-----	-----		-----
396		-----		-----	-----		-----	-----		-----
445	D1160	352.6		0.11	353.8		-0.29	358.8		-0.77
448		-----		-----	-----		-----	-----		-----
511		-----		-----	-----		-----	-----		-----
540		-----		-----	-----		-----	-----		-----
551		-----		-----	-----		-----	-----		-----
558		-----		-----	-----		-----	-----		-----
621		-----		-----	-----		-----	-----		-----
631		-----		-----	-----		-----	-----		-----
657	D1160	352		-0.26	353		-0.77	358		-1.25
824		-----		-----	-----		-----	-----		-----
863		-----		-----	-----		-----	-----		-----
1017		-----		-----	-----		-----	-----		-----
1134		-----		-----	-----		-----	-----		-----
1201		-----		-----	-----		-----	-----		-----
1213		-----		-----	-----		-----	-----		-----
1299		-----		-----	-----		-----	-----		-----
1300		-----		-----	-----		-----	-----		-----
1316		-----		-----	-----		-----	-----		-----
1320		-----		-----	-----		-----	-----		-----
1399		-----		-----	-----		-----	-----		-----
1457		-----		-----	-----		-----	-----		-----
1459		-----		-----	-----		-----	-----		-----
1494		-----		-----	-----		-----	-----		-----
1510		-----		-----	-----		-----	-----		-----
1554		-----		-----	-----		-----	-----		-----
1564		-----		-----	-----		-----	-----		-----
1569		-----		-----	-----		-----	-----		-----
1643		-----		-----	-----		-----	-----		-----
1769		-----		-----	-----		-----	-----		-----
1984		-----		-----	-----		-----	-----		-----
6001		-----		-----	-----		-----	-----		-----
6069		-----		-----	-----		-----	-----		-----
6201		340.8	G(0.01)	-7.02	347.8	G(0.01)	-3.91	-----		-----
6245		-----		-----	-----		-----	-----		-----
6259		-----		-----	-----		-----	-----		-----
6262		-----		-----	-----		-----	-----		-----
6265		-----		-----	-----		-----	-----		-----
6300		-----		-----	-----		-----	-----		-----
6314		-----		-----	-----		-----	-----		-----
6325		-----		-----	-----		-----	-----		-----
	normality	unknown			unknown			unknown		
	n	4			4			4		
	outliers	1			1			0		
	mean (n)	352.42			354.28			360.08		
	st.dev. (n)	0.532			1.069			1.972		
	R(calc.)	1.49			2.99			5.52		
	st.dev.(D1160:18)	1.657			1.657			1.657		
	R(D1160:18)	4.64			4.64			4.64		


80% recovery as AET
360
358
356
354
352
350
348
346
344
342
340
6201
150
657
445
171

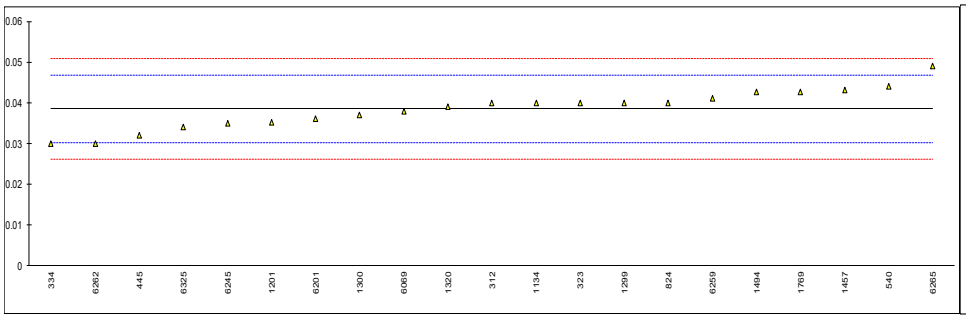

90% recovery as AET
365
360
355
350
345
340
6201
657
445
150
171

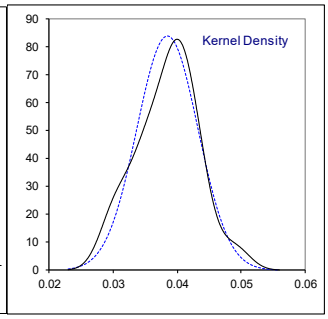

95% recovery as AET
370
365
360
355
350
345
340
657
445
171
150

Determination of Methanol on sample #20050; results in %M/M

lab	method	value	mark	z(targ)	remarks
150		-----		-----	
171		-----		-----	
312	EN14110	0.04		0.36	
323	EN14110	0.04		0.36	
334	EN14110	0.03		-2.07	
335		-----		-----	
336		-----		-----	
396		-----		-----	
445	EN14110	0.032		-1.58	
448		-----		-----	
511		-----		-----	
540	EN14110	0.044		1.34	
551		-----		-----	
558		-----		-----	
621		-----		-----	
631		-----		-----	
657		-----		-----	
824	EN14110	0.04		0.36	
863		-----		-----	
1017		-----		-----	
1134	EN14110	0.04		0.36	
1201	EN14110	0.0352		-0.80	
1213		-----		-----	
1299	EN14110	0.04		0.36	
1300	EN14110	0.037		-0.37	
1316		-----		-----	
1320	EN14110	0.039		0.12	
1399		-----		-----	
1457	EN14110	0.043		1.09	
1459		-----		-----	
1494	EN14110	0.0427		1.02	
1510		-----		-----	
1554		-----		-----	
1564		-----		-----	
1569		-----		-----	
1643		-----		-----	
1769	EN14110	0.0427		1.02	
1984		-----		-----	
6001		-----		-----	
6069	EN14110	0.038		-0.12	
6201	EN14110	0.036		-0.61	
6245	EN14110	0.035		-0.85	
6259	EN14110	0.041		0.61	
6262	EN14110	0.03		-2.07	
6265	EN14110	0.049		2.55	
6300		-----		-----	
6314		-----		-----	
6325	EN14110	0.034		-1.10	

normality	OK
n	21
outliers	0
mean (n)	0.0385
st.dev. (n)	0.00476
R(calc.)	0.0133
st.dev.(EN14110:19)	0.00411
R(EN14110:19)	0.0115

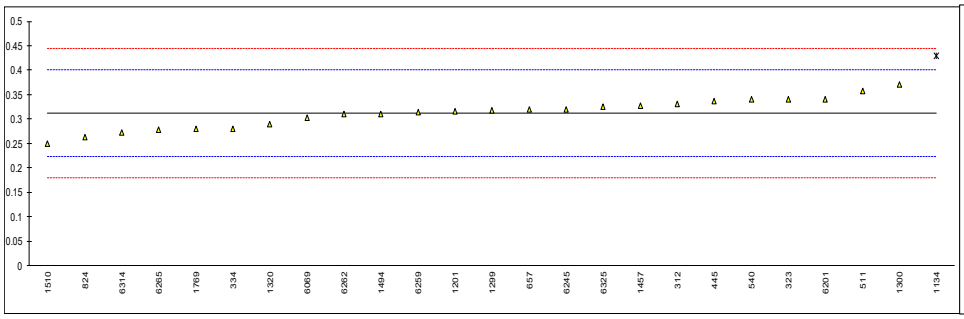


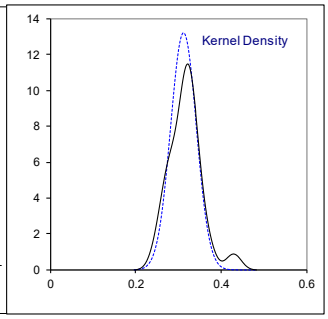


Determination of Monoglycerides on sample #20050; results in %M/M

lab	method	value	mark	z(targ)	remarks
150		-----		-----	
171		-----		-----	
312	EN14105	0.33		0.41	
323	EN14105	0.34		0.63	
334	EN14105	0.28		-0.73	
335		-----		-----	
336		-----		-----	
396		-----		-----	
445	EN14105	0.336		0.54	
448		-----		-----	
511	D6584	0.357		1.02	
540	EN14105	0.34	C	0.63	first reported 0.35
551		-----		-----	
558		-----		-----	
621		-----		-----	
631		-----		-----	
657	EN14105	0.32		0.18	
824	EN14105	0.2632		-1.11	
863		-----		-----	
1017		-----		-----	
1134	EN14105	0.43	R(0.05)	2.67	
1201	EN14105	0.315		0.07	
1213		-----		-----	
1299	EN14105	0.318		0.13	
1300	EN14105	0.3713		1.34	
1316		-----		-----	
1320	EN14105	0.29		-0.50	
1399		-----		-----	
1457	EN14105	0.327		0.34	
1459		-----		-----	
1494	D6584	0.3103		-0.04	
1510	EN14105	0.25		-1.41	
1554		-----		-----	
1564		-----		-----	
1569		-----		-----	
1643		-----		-----	
1769	D6584	0.2791		-0.75	
1984		-----		-----	
6001		-----		-----	
6069	D6584	0.3017		-0.24	
6201	EN14105	0.34		0.63	
6245	EN14105	0.320		0.18	
6259	D6584	0.314		0.04	
6262	EN14105	0.31		-0.05	
6265	EN14105	0.2788		-0.75	
6300		-----		-----	
6314	EN14105	0.273	C	-0.89	first reported 0.578
6325	EN14105	0.326		0.31	

normality	OK
n	24
outliers	1
mean (n)	0.3121
st.dev. (n)	0.03018
R(calc.)	0.0845
st.dev.(EN14105:11)	0.04417
R(EN14105:11)	0.1237

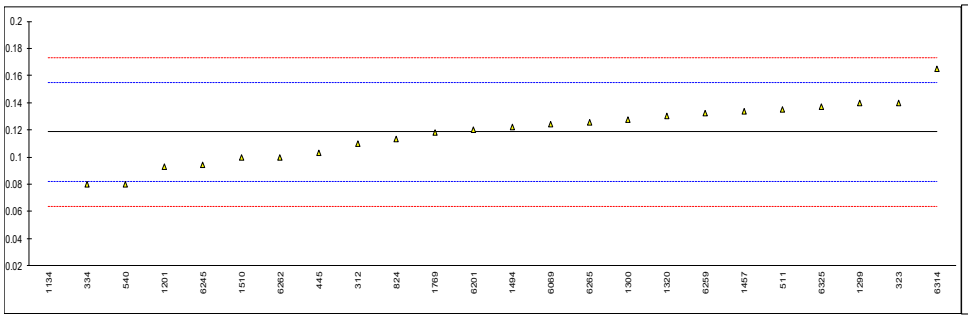


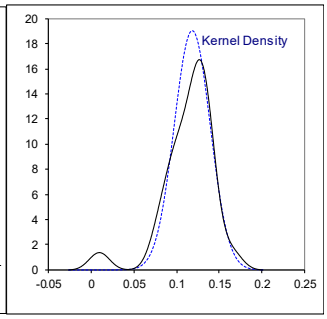


Determination of Diglycerides on sample #20050; results in %M/M

lab	method	value	mark	z(targ)	remarks
150		-----		-----	
171		-----		-----	
312	EN14105	0.11		-0.46	
323	EN14105	0.14		1.18	
334	EN14105	0.08		-2.10	
335		-----		-----	
336		-----		-----	
396		-----		-----	
445	EN14105	0.103		-0.84	
448		-----		-----	
511	D6584	0.135		0.91	
540	EN14105	0.08	C	-2.10	first reported 0.14
551		-----		-----	
558		-----		-----	
621		-----		-----	
631		-----		-----	
657	EN14105	<0.10		-----	
824	EN14105	0.1132		-0.28	
863		-----		-----	
1017		-----		-----	
1134	EN14105	0.01	R(0.01)	-5.93	
1201	EN14105	0.093		-1.39	
1213		-----		-----	
1299	EN14105	0.140		1.18	
1300	EN14105	0.1275		0.50	
1316		-----		-----	
1320	EN14105	0.13		0.63	
1399		-----		-----	
1457	EN14105	0.134		0.85	
1459		-----		-----	
1494	D6584	0.1218		0.19	
1510	EN14105	0.10		-1.01	
1554		-----		-----	
1564		-----		-----	
1569		-----		-----	
1643		-----		-----	
1769	D6584	0.1182		-0.01	
1984		-----		-----	
6001		-----		-----	
6069	D6584	0.1241		0.31	
6201	EN14105	0.12		0.09	
6245	EN14105	0.094		-1.33	
6259	D6584	0.132		0.74	
6262	EN14105	0.10		-1.01	
6265	EN14105	0.1254		0.38	
6300		-----		-----	
6314	EN14105	0.165		2.55	
6325	EN14105	0.137		1.02	

normality	OK
n	23
outliers	1
mean (n)	0.1184
st.dev. (n)	0.02096
R(calc.)	0.0587
st.dev.(EN14105:11)	0.01829
R(EN14105:11)	0.0512

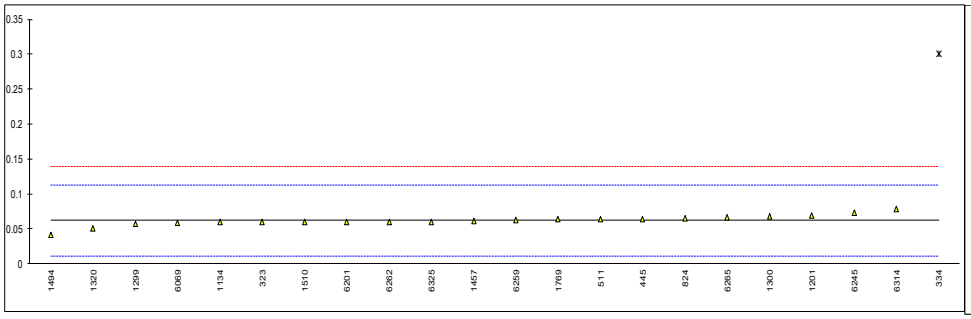


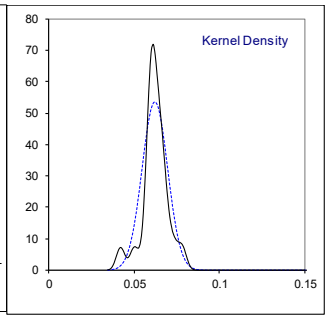


Determination of Triglycerides on sample #20050; results in %M/M

lab	method	value	mark	z(targ)	remarks
150		-----		-----	
171		-----		-----	
312	EN14105	<0.10		-----	
323	EN14105	0.06		-0.08	
334	EN14105	0.30	C,R(0.01)	9.29	first reported 0.69
335		-----		-----	
336		-----		-----	
396		-----		-----	
445	EN14105	0.064		0.08	
448		-----		-----	
511	D6584	0.064		0.08	
540	EN14105	<0.05		-----	
551		-----		-----	
558		-----		-----	
621		-----		-----	
631		-----		-----	
657	EN14105	<0.10		-----	
824	EN14105	0.0657		0.14	
863		-----		-----	
1017		-----		-----	
1134	EN14105	0.06		-0.08	
1201	EN14105	0.069		0.27	
1213		-----		-----	
1299	EN14105	0.057		-0.20	
1300	EN14105	0.0672		0.20	
1316		-----		-----	
1320	EN14105	0.05		-0.47	
1399		-----		-----	
1457	EN14105	0.061		-0.04	
1459		-----		-----	
1494	D6584	0.0419		-0.78	
1510	EN14105	0.06		-0.08	
1554		-----		-----	
1564		-----		-----	
1569		-----		-----	
1643		-----		-----	
1769	D6584	0.0632		0.05	
1984		-----		-----	
6001		-----		-----	
6069	D6584	0.0580		-0.16	
6201	EN14105	0.06		-0.08	
6245	EN14105	0.073		0.43	
6259	D6584	0.063		0.04	
6262	EN14105	0.06		-0.08	
6265	EN14105	0.0669		0.19	
6300		-----		-----	
6314	EN14105	0.078		0.62	
6325	EN14105	0.060		-0.08	

normality	not OK
n	21
outliers	1
mean (n)	0.0620
st.dev. (n)	0.00747
R(calc.)	0.0209
st.dev.(EN14105:11)	0.02561
R(EN14105:11)	0.0717

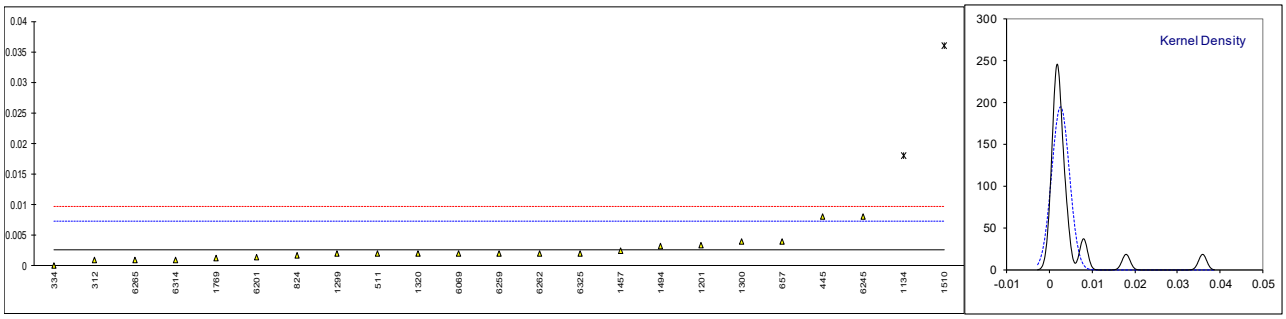




Determination of Free Glycerol on sample #20050; results in %M/M

lab	method	value	mark	z(targ)	remarks
150		-----		-----	
171		-----		-----	
312	EN14105	0.001		-0.68	
323	EN14105	<0.001		-----	
334	EN14105	0.000		-1.10	
335		-----		-----	
336		-----		-----	
396		-----		-----	
445	EN14105	0.008		2.30	
448		-----		-----	
511	D6584	0.002		-0.25	
540	EN14105	<0.01	C	-----	first reported 0.017
551		-----		-----	
558		-----		-----	
621		-----		-----	
631		-----		-----	
657	EN14105	0.004		0.60	
824	EN14105	0.0017		-0.38	
863		-----		-----	
1017		-----		-----	
1134	EN14105	0.018	R(0.01)	6.56	
1201	EN14105	0.0034		0.35	
1213		-----		-----	
1299	EN14105	0.00195		-0.27	
1300	EN14105	0.004		0.60	
1316		-----		-----	
1320	EN14105	0.002		-0.25	
1399		-----		-----	
1457	EN14105	0.0025		-0.04	
1459		-----		-----	
1494	D6584	0.0032		0.26	
1510	EN14105	0.036	R(0.01)	14.23	
1554		-----		-----	
1564		-----		-----	
1569		-----		-----	
1643		-----		-----	
1769	D6584	0.0012		-0.59	
1984		-----		-----	
6001		-----		-----	
6069	D6584	0.0020		-0.25	
6201	EN14105	0.0014		-0.51	
6245	EN14105	0.0080		2.30	
6259	D6584	0.002		-0.25	
6262	EN14105	0.002		-0.25	
6265	EN14105	0.001		-0.68	
6300		-----		-----	
6314	EN14105	0.001		-0.68	
6325	EN14105	0.002		-0.25	

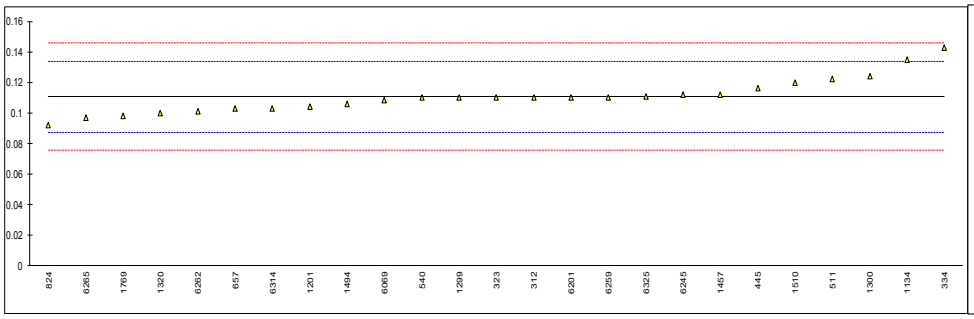
normality	not OK
n	21
outliers	2
mean (n)	0.0026
st.dev. (n)	0.00206
R(calc.)	0.0058
st.dev.(EN14105:11)	0.00235
R(EN14105:11)	0.0066

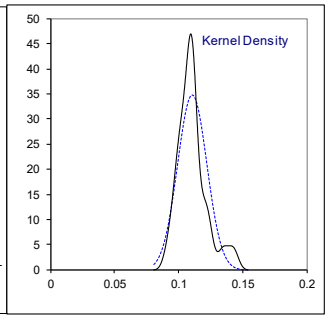


Determination of Total Glycerol on sample #20050; results in %M/M

lab	method	value	mark	z(targ)	remarks
150		-----		-----	
171		-----		-----	
312	EN14105	0.11		-0.06	
323	EN14105	0.11		-0.06	
334	EN14105	0.143	C	2.78	first reported 0.154
335		-----		-----	
336		-----		-----	
396		-----		-----	
445	EN14105	0.116		0.46	
448		-----		-----	
511	D6584	0.122		0.97	
540	EN14105	0.11	C	-0.06	first reported 0.13
551		-----		-----	
558		-----		-----	
621		-----		-----	
631		-----		-----	
657	EN14105	0.103		-0.66	
824	EN14105	0.0921		-1.60	
863		-----		-----	
1017		-----		-----	
1134	EN14105	0.135		2.09	
1201	EN14105	0.104		-0.57	
1213		-----		-----	
1299	EN14105	0.110		-0.06	
1300	EN14105	0.1242		1.16	
1316		-----		-----	
1320	EN14105	0.100		-0.92	
1399		-----		-----	
1457	EN14105	0.112		0.11	
1459		-----		-----	
1494	D6584	0.1061		-0.39	
1510	EN14105	0.12		0.80	
1554		-----		-----	
1564		-----		-----	
1569		-----		-----	
1643		-----		-----	
1769	D6584	0.0978		-1.11	
1984		-----		-----	
6001		-----		-----	
6069	D6584	0.1081		-0.22	
6201	EN14105	0.110		-0.06	
6245	EN14105	0.1118		0.10	
6259	D6584	0.110		-0.06	
6262	EN14105	0.101		-0.83	
6265	EN14105	0.097		-1.18	
6300		-----		-----	
6314	EN14105	0.103	C	-0.66	first reported 0.181
6325	EN14105	0.111		0.03	

normality	not OK
n	25
outliers	0
mean (n)	0.1107
st.dev. (n)	0.01148
R(calc.)	0.0322
st.dev.(EN14105:11)	0.01163
R(EN14105:11)	0.0326

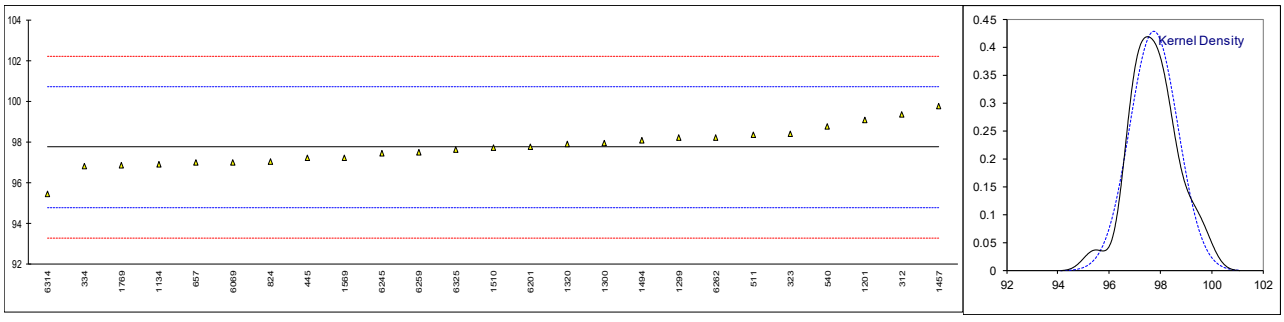




Determination of Total Ester content (FAME) on sample #20050; results in %M/M

lab	method	value	mark	z(targ)	remarks
150		-----		-----	
171		-----		-----	
312	EN14103	99.37		1.09	
323	EN14103	98.4		0.44	
334	EN14103	96.8		-0.64	
335		-----		-----	
336		-----		-----	
396		-----		-----	
445	EN14103	97.2		-0.37	
448		-----		-----	
511	EN14103	98.37		0.42	
540	EN14103	98.75		0.68	
551		-----		-----	
558		-----		-----	
621		-----		-----	
631		-----		-----	
657	EN14103	97.0		-0.50	
824	EN14103	97.03		-0.48	
863		-----		-----	
1017		-----		-----	
1134	EN14103	96.895		-0.57	
1201	EN14103	99.1		0.91	
1213		-----		-----	
1299	EN14103	98.2		0.31	
1300	EN14103	97.93		0.12	
1316		-----		-----	
1320	EN14103	97.91		0.11	
1399		-----		-----	
1457	EN14103	99.76		1.36	
1459		-----		-----	
1494	EN14103	98.07		0.22	
1510	EN14103	97.7		-0.03	
1554		-----		-----	
1564		-----		-----	
1569	EN14103	97.24		-0.34	
1643		-----		-----	
1769	EN14103	96.88		-0.58	
1984		-----		-----	
6001		-----		-----	
6069	EN14103	97.017		-0.49	
6201	EN14103	97.77		0.02	
6245	EN14103	97.46		-0.19	
6259	EN14103	97.48		-0.18	
6262	EN14103	98.2		0.31	
6265		-----		-----	
6300		-----		-----	
6314	EN14103	95.45		-1.54	
6325	EN14103	97.64		-0.07	

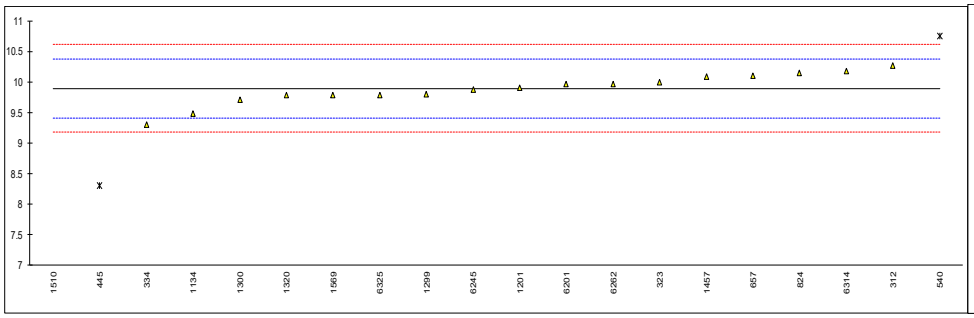
normality	OK
n	25
outliers	0
mean (n)	97.7449
st.dev. (n)	0.93300
R(calc.)	2.6124
st.dev.(EN14103:11)	1.48571
R(EN14103:11)	4.16

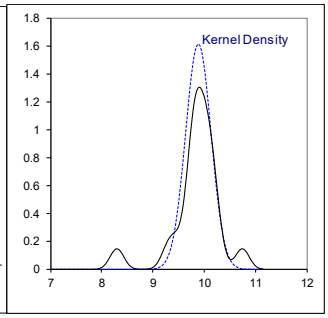


Determination of Linolenic Acid Methyl Ester content on sample #20050; results in %M/M

lab	method	value	mark	z(targ)	remarks
150		-----		-----	
171		-----		-----	
312	EN14103	10.26		1.54	
323	EN14103	10.0		0.46	
334	EN14103	9.3		-2.47	
335		-----		-----	
336		-----		-----	
396		-----		-----	
445	EN14103	8.3	R(0.01)	-6.66	
448		-----		-----	
511		-----		-----	
540	EN14103	10.75	R(0.01)	3.59	
551		-----		-----	
558		-----		-----	
621		-----		-----	
631		-----		-----	
657	EN14103	10.1		0.87	
824	EN14103	10.14		1.04	
863		-----		-----	
1017		-----		-----	
1134	EN14103	9.48		-1.72	
1201	EN14103	9.9		0.04	
1213		-----		-----	
1299	EN14103	9.8		-0.38	
1300	EN14103	9.71		-0.76	
1316		-----		-----	
1320	EN14103	9.786		-0.44	
1399		-----		-----	
1457	EN14103	10.09		0.83	
1459		-----		-----	
1494		-----		-----	
1510	EN14103	0.8	R(0.01)	-38.04	
1554		-----		-----	
1564		-----		-----	
1569	EN14103	9.79		-0.42	
1643		-----		-----	
1769		-----		-----	
1984		-----		-----	
6001		-----		-----	
6069		-----		-----	
6201	EN14103	9.97		0.33	
6245	EN14103	9.88		-0.05	
6259		-----		-----	
6262	EN14103	9.97		0.33	
6265		-----		-----	
6300		-----		-----	
6314	EN14103	10.18		1.21	
6325	EN14103	9.79		-0.42	

normality	OK
n	17
outliers	3
mean (n)	9.891
st.dev. (n)	0.2475
R(calc.)	0.693
st.dev.(EN14103:11)	0.2390
R(EN14103:11)	0.669





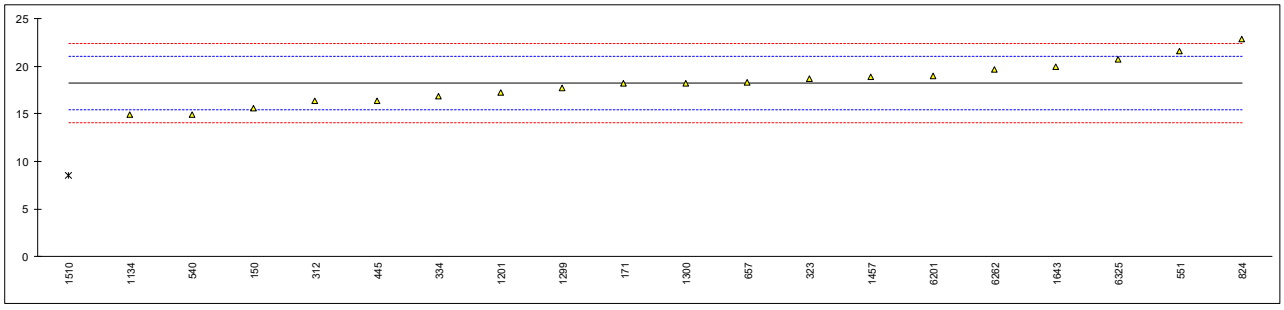
Determination of Polyunsaturated (more or 4 double bonds) Methyl Esters on sample #20050; results in %M/M

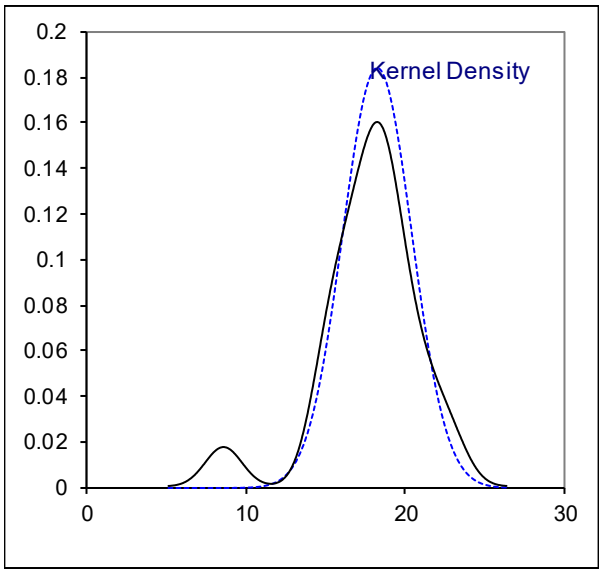
lab	method	value	mark	z(targ)	remarks
150		-----		-----	
171		-----		-----	
312	EN15779	0.28		-----	
323	EN15779	<0.6		-----	
334	EN15779	0.33		-----	
335		-----		-----	
336		-----		-----	
396		-----		-----	
445		-----		-----	
448		-----		-----	
511		-----		-----	
540		-----		-----	
551		-----		-----	
558		-----		-----	
621		-----		-----	
631		-----		-----	
657	EN15779	<0.60		-----	
824		-----		-----	
863		-----		-----	
1017		-----		-----	
1134		-----		-----	
1201	EN15779	0.43		-----	
1213		-----		-----	
1299	EN15779	0.04		-----	
1300	EN15779	0.415		-----	
1316		-----		-----	
1320		-----		-----	
1399		-----		-----	
1457	EN15779	0.178		-----	
1459		-----		-----	
1494		-----		-----	
1510		-----		-----	
1554		-----		-----	
1564		-----		-----	
1569		-----		-----	
1643		-----		-----	
1769		-----		-----	
1984		-----		-----	
6001		-----		-----	
6069		-----		-----	
6201	EN15779	<0.6		-----	
6245		-----		-----	
6259		-----		-----	
6262	EN15779	<0.60		-----	
6265		-----		-----	
6300		-----		-----	
6314		-----		-----	
6325	EN15779	0.18		-----	
	n	11			
	mean (n)	<0.6			Application range EN15779:13 is 0.6 – 1.5%M/M

Determination of sum of Calcium and Magnesium as Ca + Mg on sample #20051; results in mg/kg

lab	method	value	mark	z(targ)	remarks
150	EN14538	15.6		-1.90	
171	EN14538	18.2		-0.03	
312	EN14538	16.4	C	-1.32	first reported 26.3
323	EN14538	18.7		0.33	
334	EN14538	16.9	C	-0.97	first reported 26.4
445	EN14538	16.4		-1.32	
540	EN14538	14.95		-2.36	
551	UOP389	21.66		2.45	
657	EN14538	18.3		0.04	
824	EN14538	22.9		3.34	
1134	EN14538	14.94		-2.37	
1201	EN14538	17.3		-0.68	
1299	EN14538	17.8		-0.32	
1300	EN14538	18.24		0.00	
1316		-----		-----	
1457	EN14538	18.91		0.48	
1510	EN14538	8.6	D(0.05)	-6.92	
1564		-----		-----	
1643	D5185	19.98		1.24	
6201	EN14538	19		0.54	
6262	EN14538	19.7		1.04	
6265		-----		-----	
6325	EN14538	20.8		1.83	

normality	OK
n	19
outliers	1
mean (n)	18.246
st.dev. (n)	2.1692
R(calc.)	6.074
st.dev.(EN14538:06)	1.3945
R(EN14538:06)	3.905

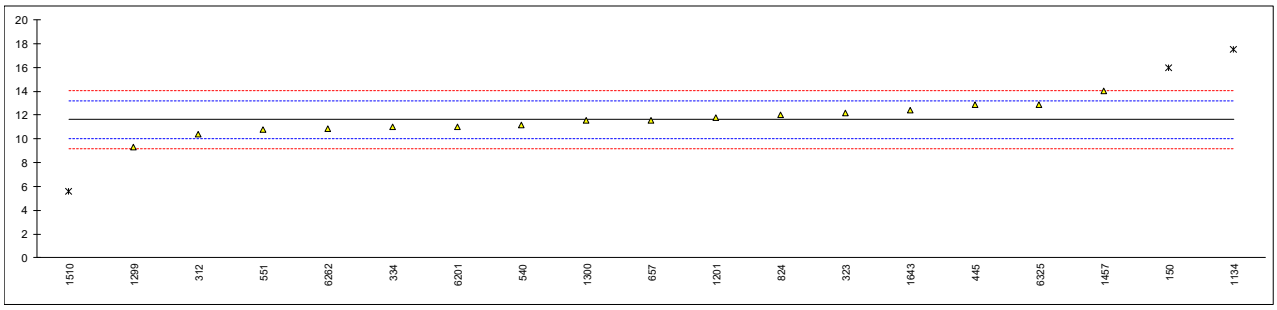


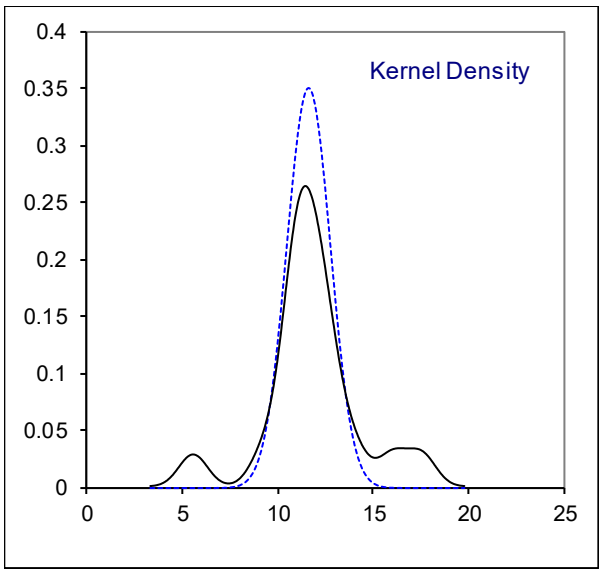


Determination of Phosphorus as P on sample #20051; results in mg/kg

lab	method	value	mark	z(targ)	remarks
150	EN14107	16.0	C,D(0.01)	5.43	first reported 6.9
171		-----		-----	
312	EN14107	10.4	C	-1.52	first reported 7.7
323	EN14107	12.2		0.71	
334	EN14107	11.0		-0.78	
445	EN14107	12.9		1.58	
540	EN14107	11.20		-0.53	
551	UOP389	10.79		-1.04	
657	EN14107	11.6		-0.03	
824	EN14107	12		0.46	
1134	EN14107	17.52	D(0.01)	7.31	
1201	EN14107	11.8		0.22	
1299	EN14107	9.3		-2.89	
1300	EN16294	11.56		-0.08	
1316		-----		-----	
1457	EN14107	14.06		3.02	
1510	EN14107	5.6	D(0.01)	-7.48	
1564		-----		-----	
1643	D5185	12.41		0.97	
6201	EN14107	11		-0.78	
6262	EN14107	10.9		-0.90	
6265		-----		-----	
6325	EN14107	12.9		1.58	

normality	OK
n	16
outliers	3
mean (n)	11.626
st.dev. (n)	1.1371
R(calc.)	3.184
st.dev.(EN14107:03)	0.8062
R(EN14107:03)	2.257

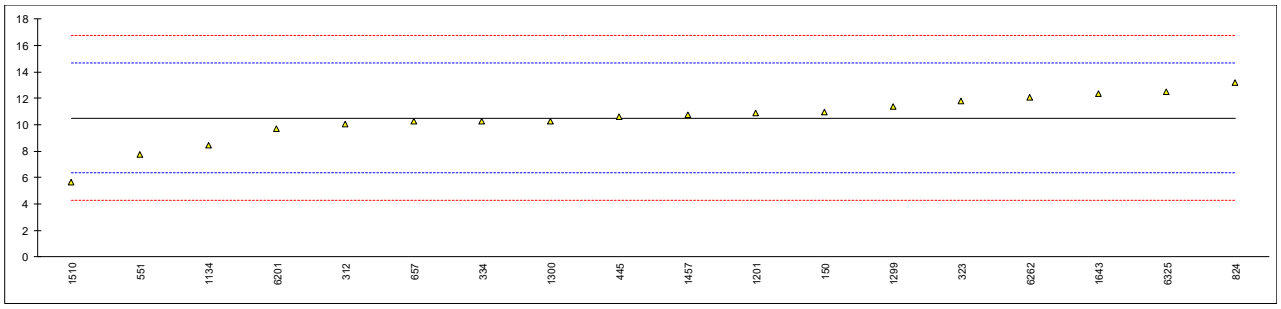


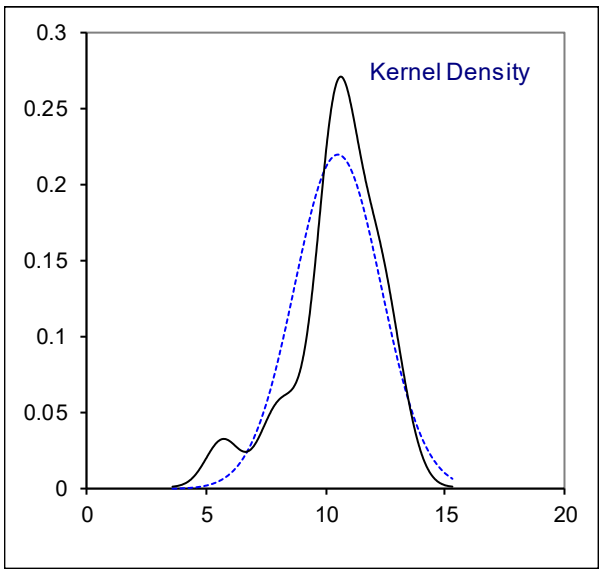


Determination of Potassium as K on sample #20051; results in mg/kg

lab	method	value	mark	z(targ)	remarks
150	EN14109	11.0		0.23	
171		-----		-----	
312	EN14538	10.1	C	-0.20	first reported 17.0
323	EN14109	11.8		0.62	
334	EN14538	10.3	C	-0.10	first reported 14.9
445	EN14109	10.6		0.04	
540		-----		-----	
551	UOP389	7.74		-1.33	
657	EN14538	10.3		-0.10	
824	EN14538	13.2		1.29	
1134	EN14538	8.48		-0.98	
1201	EN14538	10.9		0.18	
1299	EN14538	11.4		0.42	
1300	EN14538	10.30		-0.10	
1316		-----		-----	
1457	EN14538	10.79		0.13	
1510	EN14109	5.7		-2.31	
1564		-----		-----	
1643	D5185	12.37		0.89	
6201	EN14109	9.7		-0.39	
6262	EN14538	12.1		0.76	
6265		-----		-----	
6325	EN14538	12.5		0.95	

normality	suspect
n	18
outliers	0
mean (n)	10.516
st.dev. (n)	1.8150
R(calc.)	5.082
st.dev.(EN14109:03)	2.0830
R(EN14109:03)	5.832

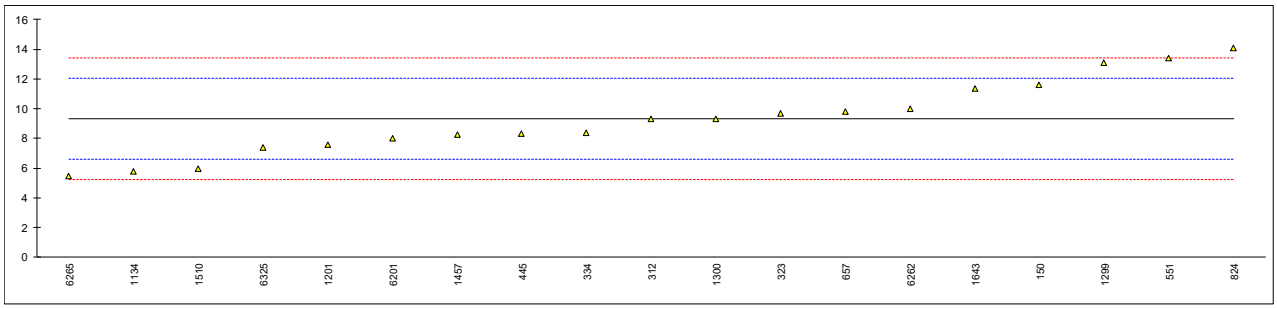


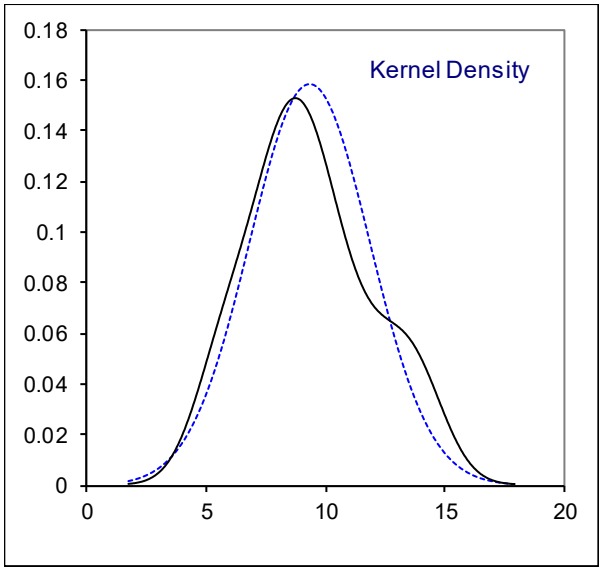


Determination of Sodium as Na on sample #20051; results in mg/kg

lab	method	value	mark	z(targ)	remarks
150	EN14108	11.6		1.68	
171		-----		-----	
312	EN14538	9.3	C	-0.01	first reported 14.9
323	EN14108	9.7		0.28	
334	EN14538	8.4	C	-0.67	first reported 13.2
445	EN14108	8.3		-0.75	
540		-----		-----	
551	UOP389	13.42		3.02	
657	EN14538	9.8		0.36	
824	EN14538	14.1		3.52	
1134	EN14538	5.80		-2.59	
1201	EN14538	7.6		-1.26	
1299	EN14538	13.1		2.79	
1300	EN14538	9.34		0.02	
1316		-----		-----	
1457	EN14538	8.25		-0.78	
1510	EN14108	6.0		-2.44	
1564		-----		-----	
1643	D5185	11.34		1.49	
6201	EN14108	8		-0.97	
6262	EN14538	10.0		0.51	
6265	EN14538	5.5	C	-2.81	first reported 3.5
6325	EN14538	7.4		-1.41	

normality	OK
n	19
outliers	0
mean (n)	9.313
st.dev. (n)	2.5109
R(calc.)	7.031
st.dev.(EN14108:03)	1.3587
R(EN14108:03)	3.804

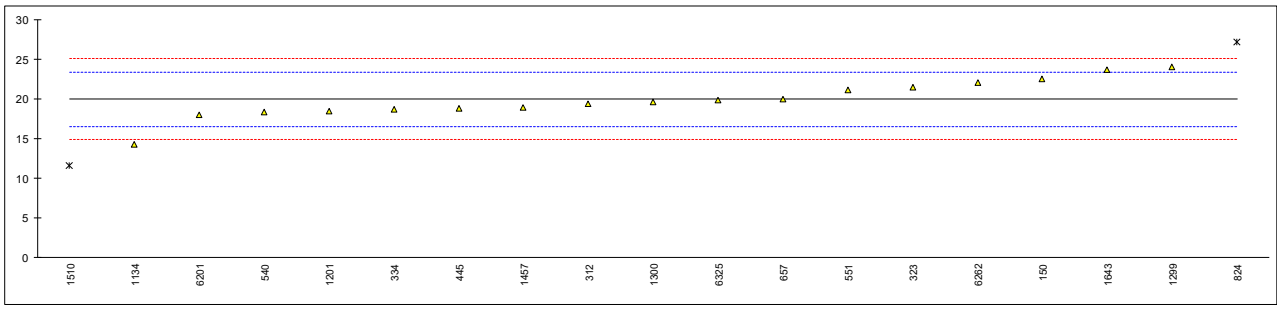


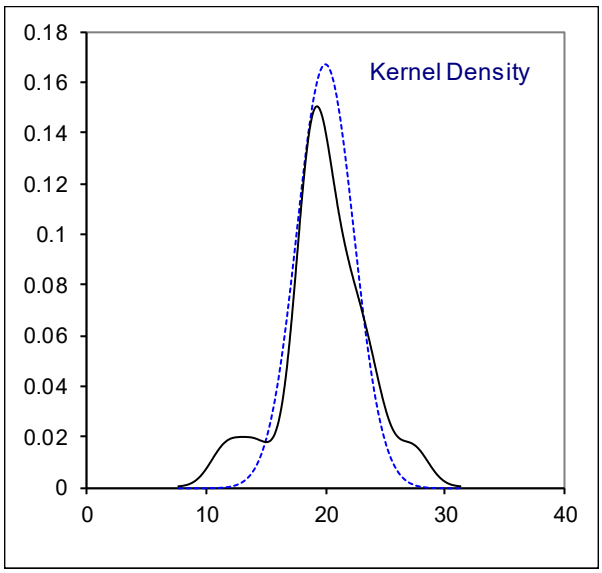


Determination of Sum of Potassium and Sodium as K + Na on sample #20051; results in mg/kg

lab	method	value	mark	z(targ)	remarks
150	EN14538	22.6		1.53	
171		-----		-----	
312	EN14538	19.4	C	-0.35	first reported 31.9
323	EN14538	21.5		0.89	
334	EN14538	18.7	C	-0.76	first reported 28.1
445	EN14538	18.9		-0.64	
540	EN14538	18.35		-0.97	
551	UOP389	21.16		0.69	
657	EN14538	20.0		0.00	
824	EN14538	27.3	D(0.05)	4.30	
1134	EN14538	14.28		-3.36	
1201	EN14538	18.5		-0.88	
1299	EN14538	24.1		2.42	
1300	EN14538	19.64		-0.21	
1316		-----		-----	
1457	EN14538	19.03		-0.57	
1510	EN14538	11.7	D(0.05)	-4.88	
1564		-----		-----	
1643	D5185	23.71		2.19	
6201	EN14538	18		-1.17	
6262	EN14538	22.1		1.24	
6265		-----		-----	
6325	EN14538	19.9		-0.05	

normality	OK
n	17
outliers	2
mean (n)	19.992
st.dev. (n)	2.3897
R(calc.)	6.691
st.dev.(EN14538:06)	1.6998
R(EN14538:06)	4.760





Determination of Particulate Contamination on sample #20052; results in mg/L

lab	method	value	mark	z(targ)	Vol. filtered	Number of filtrations	remarks
150		-----		-----	-----	-----	
171	D7321	33.0		-----	400	3	
323		-----		-----	-----	-----	
334		-----		-----	-----	-----	
335		-----		-----	-----	-----	
445		-----		-----	-----	-----	
540		-----		-----	-----	-----	
551		-----		-----	-----	-----	
621		-----		-----	-----	-----	
657		-----		-----	-----	-----	
1134		-----		-----	-----	-----	
1201		-----		-----	-----	-----	
1299		-----		-----	-----	-----	
1300		-----		-----	-----	-----	
1316		-----		-----	-----	-----	
1320		-----		-----	-----	-----	
1457		-----		-----	-----	-----	
1494		-----		-----	-----	-----	
1510		-----		-----	-----	-----	
1554		-----		-----	-----	-----	
1564		-----		-----	-----	-----	
1739		-----		-----	-----	-----	
1769		-----		-----	-----	-----	
1984		-----		-----	-----	-----	
6069		-----		-----	-----	-----	
6201		-----		-----	-----	-----	
6259		-----		-----	-----	-----	
6262		-----		-----	-----	-----	
6265		-----		-----	-----	-----	
6314		-----		-----	-----	-----	
6325		-----		-----	-----	-----	
	n	1					
	mean (n)	n.a.					

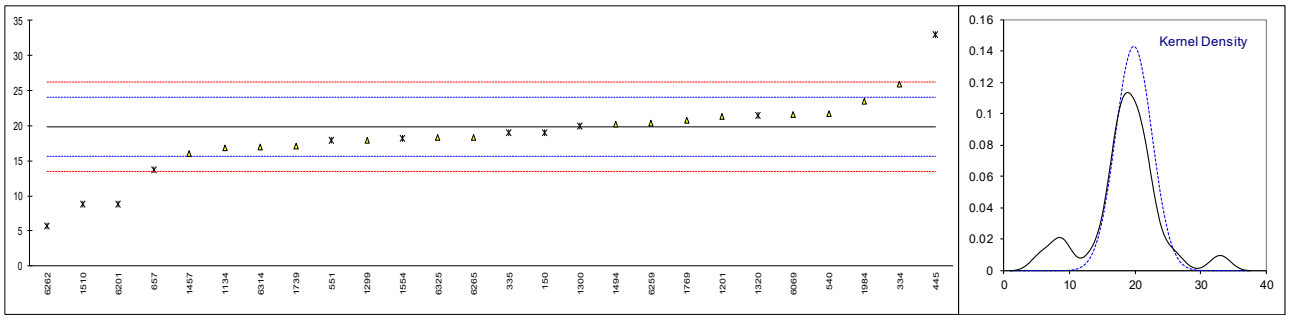
Determination of Total Contamination (EN12662) on sample #20052; results in mg/kg

lab	method	value	mark	z(targ)	Incomplete	Vol.filtered	stopped	
150	EN12662:2014	19.0	ex	-0.39	NO	-----	-----	
171	EN12662:2008	>30	C	>4.78	NO	-----	-----	f+?
323		-----		-----		-----	-----	
334	EN12662:1998	26		2.90	YES	-----	-----	
335	EN12662:2014	19	ex	-0.39	NO	-----	-----	
445	EN12662:1998	33.0	D(0.05)	6.19		-----	-----	
540	EN12662:1998	21.80		0.92	NO	0	15	
551	EN12662:2014	17.9	ex	-0.91	NO	300	10	
621		-----		-----		-----	-----	
657	EN12662:2014	13.7	ex	-2.89	NO	-----	-----	
1134	EN12662:1998	16.8		-1.43	NO	-----	-----	
1201	EN12662:1998	21.4		0.73	NO	-----	-----	
1299	EN12662:1998	18.0		-0.87	YES	300	-----	
1300	EN12662:2014	20.025	ex	0.09		-----	-----	
1316		-----		-----	YES	-----	60	
1320	EN12662:2014	21.5	ex	0.78		-----	-----	
1457	EN12662:1998	16.1		-1.76	NO	-----	-----	
1494	EN12662:2008	20.312		0.22	YES	-----	-----	
1510	EN12662:2008	8.8	ex	-5.19	YES	-----	-----	
1554	EN12662:2014	18.27	ex	-0.74	NO	-----	-----	
1564		-----		-----		-----	-----	
1739	EN12662:1998	17.10		-1.29	YES	-----	-----	
1769	EN12662:2008	20.80		0.45	NO	800	-----	
1984	EN12662:1998	23.5		1.72	NO	-----	-----	
6069	EN12662:2008	21.60		0.83		-----	-----	
6201	EN12662:1998	8.8	ex	-5.19	YES	300	-----	
6259	EN12662:2008	20.40		0.26		-----	-----	
6262	EN12662:1998	5.7	ex	-6.65		-----	-----	
6265	EN12662:1998	18.41		-0.67	NO	500	-----	
6314	EN12662:2008	17		-1.34	NO	-----	-----	
6325	EN12662:1998	18.36		-0.70	NO	-----	-----	

	normality	OK	
	n	15	
	outliers	1+(10ex)	Spike:
	mean (n)	19.839	16.5
	st.dev. (n)	2.7851	
	R(calc.)	7.798	
	st.dev.(EN12662:08)	2.1256	
	R(EN12662:08)	5.952	
Compare			
	R(EN12662:98)	5.952	

Lab 171 first reported >33

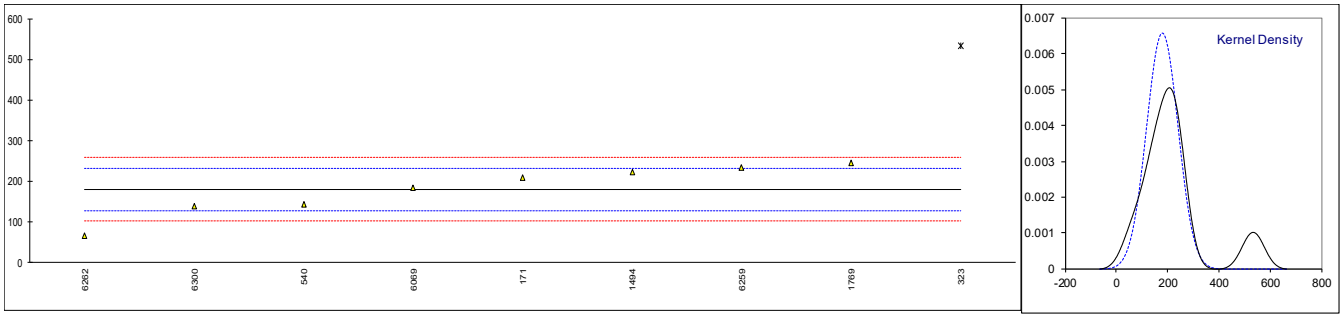
ex = excluded from statistical analysis. Test result has been excluded because EN12662:2014 is not applicable to FAME (B100) according to CEN/TC 19 Committee, instead either method EN12662:1998 or EN12662:2008 should be used. See also iis memo 1903. Or the reported test result was below the expected detectable value of the spike (11.1=Spike-R(Spike))



Determination of Filter Blocking Potential by Cold Soak Filterability Test (CSFT) on sample #20053; results in s

lab	method	value	mark	z(targ)	Vol. (mL) at time >720sec	Remarks
150		-----		-----	-----	
171	D7501	208		1.06	300	
323	D7501	533	D(0.01)	13.54	-----	
540	D7501	143		-1.44	0	
657		-----		-----	-----	
1026		-----		-----	-----	
1134		-----		-----	-----	
1135	D7501	> 720		>20.72	230	possibly a false positive test result?
1201		-----		-----	-----	
1320		-----		-----	-----	
1402		-----		-----	-----	
1457		-----		-----	-----	
1494	D7501	222		1.60	-----	
1510		-----		-----	-----	
1739		-----		-----	-----	
1769	D7501	246		2.52	-----	
6069	D7501	183.0		0.10	-----	
6201		-----		-----	-----	
6259	D7501	235		2.10	-----	
6262	D7501	67		-4.35	-----	
6265		-----		-----	-----	
6300	D7501	139		-1.59	-----	

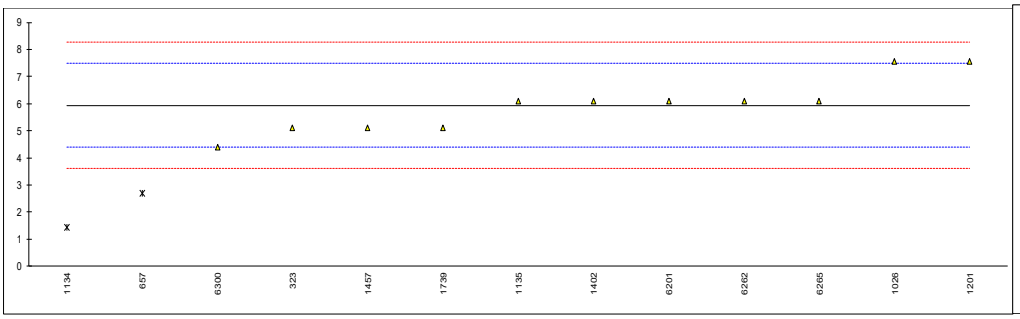
normality	OK
n	8
outliers	1
mean (n)	180.4
st.dev. (n)	60.66
R(calc.)	169.8
st.dev.(D7501:18a)	26.05
R(D7501:18a)	72.9

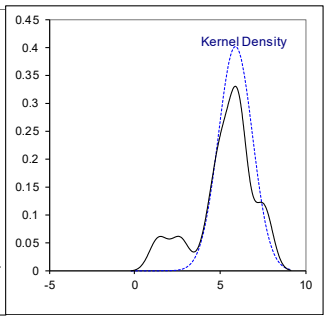


Determination of Filter Blocking Tendency (FBT) on sample #20053

lab	method	value	mark	z(targ)	press. end test (kPa)	vol. pumped mL	remarks
150		-----		-----	-----	-----	
171		-----		-----	-----	-----	
323	D2068-B	5.10		-1.07	105	60	
540		-----		-----	-----	-----	
657	IP387-B	2.69	C,D(0.01)	-4.19	105	130	fr. 2.52
1026	IP387-B	7.57		2.12	105	40	
1134	IP387-B	1.43	D(0.05)	-5.82	105	294	
1135	IP387-B	6.08		0.19	105	50	
1201	IP387-B	7.57		2.12	105	40	
1320		-----		-----	-----	-----	
1402	IP387-B	6.08		0.19	105	47.5	
1457	IP387-B	5.10		-1.07	105	60	
1494		-----		-----	-----	-----	
1510		-----		-----	-----	-----	
1739	IP387-B	5.10		-1.07	105	60	
1769		-----		-----	-----	-----	
6069		-----		-----	-----	-----	
6201	D2068-B	6.08		0.19	105	50	
6259		-----		-----	-----	-----	
6262	IP387-B	6.08		0.19	105	50	
6265	IP387-B	6.08		0.19	105	50	
6300	D2068-B	4.40		-1.98	105	70	

normality	OK
n	11
outliers	2
mean (n)	5.931
st.dev. (n)	0.9950
R(calc.)	2.786
st.dev.(D2068-B:17)	0.7739
R(D2068-B:17)	2.167





APPENDIX 2

Number of participants per country

2 labs in	ARGENTINA
4 labs in	BELGIUM
2 labs in	BRAZIL
1 lab in	BULGARIA
1 lab in	CHINA, People's Republic
4 labs in	COLOMBIA
1 lab in	ESTONIA
5 labs in	FRANCE
1 lab in	HONG KONG
1 lab in	INDONESIA
1 lab in	ITALY
6 labs in	NETHERLANDS
1 lab in	PERU
1 lab in	PHILIPPINES
1 lab in	POLAND
1 lab in	PORTUGAL
1 lab in	ROMANIA
1 lab in	SINGAPORE
1 lab in	SLOVAKIA
1 lab in	SOUTH AFRICA
1 lab in	SOUTH KOREA
4 labs in	SPAIN
2 labs in	SWEDEN
5 labs in	UNITED KINGDOM
2 labs in	UNITED STATES OF AMERICA
1 lab in	VIETNAM

APPENDIX 3

Abbreviations

C	= final test result after checking of first reported suspect test result
D(0.01)	= outlier in Dixon's outlier test
D(0.05)	= straggler in Dixon's outlier test
G(0.01), G(1)	= outlier in Grubbs' outlier test
G(0.05), G(5)	= straggler in Grubbs' outlier test
DG(0.01), DG(1)	= outlier in Double Grubbs' outlier test
DG(0.05), DG(5)	= straggler in Double Grubbs' outlier test
R(0.01), R(1)	= outlier in Rosner's outlier test
R(0.05), R(5)	= straggler in Rosner's outlier test
E	= possibly an error in calculations
W	= test result withdrawn on request of participant
ex	= test result excluded from statistical evaluation
n.a.	= not applicable
n.e.	= not evaluated
n.d.	= not detected
fr.	= first reported
SDS	= Safety Data Sheet

Literature

1 iis Interlaboratory Studies, Protocol for the Organisation, Statistics & Evaluation, June 2018
2 ASTM E178:16
3 ASTM E1301:95(2003)
4 ISO5725:86 (1994)
5 ISO5725, parts 1-6, 1994
6 ISO13528:05
7 M. Thompson and R. Wood, J. AOAC Int, 76, 926, (1993)
8 W.J. Youden and E.H. Steiner, Statistical Manual of the AOAC, (1975)
9 IP367:84
10 DIN38402 T41/42
11 P.L. Davies, Fr. Z. Anal. Chem, 331, 513, (1988)
12 J.N. Miller, Analyst, 118, 455, (1993)
13 Analytical Methods Committee Technical Brief, No 4, January 2001
14 P.J. Lowthian and M. Thompson, The Royal Society of Chemistry, Analyst, 127, 1359-1364, (2002)
15 Bernard Rosner, Percentage Points for a Generalized ESD Many-Outlier Procedure, Technometrics, 25(2), 165-172, (1983)
16 Horwitz, W and Albert, R, J. AOAC Int, 79, 3, 589, (1996)
17 Letter of CEN: CEN/TC 19 explanation on total contamination test result and applicability for FAME, dated 16-9-2015 and issued by Ortwin Costenoble on behalf of Liesbeth Jansen (CEN/TC 19 Chairman) and Nigel Elliot (CEN/TC 19/WG 24 Convenor).
18 iis memo 1903, Biodiesel B100 (100% FAME) for Total Contamination EN12662.