

NISTIR 7953

**Interlaboratory Analytical
Comparison Study of Total Fatty Acid
Concentrations in Human Serum:
Results for Exercise 01:
QA12FASER01**

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ABSTRACT

The National Institute of Standards and Technology (NIST), in conjunction with the Centers for Disease Control and Prevention (CDC) and NIH's Office of Dietary Supplements (ODS), initiated an interlaboratory analytical comparison study of total fatty acid concentrations in human serum in May 2012. The first sample was candidate Standard Reference Material (SRM) 2378. SRM 2378 consists of three levels of fatty acids in serum collected from: (1) donors who have not taken fish or flaxseed oil supplements for one month prior to collection; (2) donors who have taken flaxseed oil supplements for a minimum of one month prior to collection; and (3) donors who have taken fish oil supplements for a minimum of one month prior to collection. In addition, participants were requested to run SRM 1950 Metabolites in Human Plasma as a control sample. This is a performance-based program so participating laboratories were requested to use the analytical procedures that they typically use in their laboratories for these analyses and report data for those fatty acids that they typically quantify. The results from the first exercise are reported along with a summary of the analytical methods used.

Overview of Exercise 01: QA12FASER01

For the first exercise of Interlaboratory Analytical Comparison Study of Total Fatty Acid Concentrations in Human Serum, candidate Standard Reference Material (SRM) 2378 was distributed as the study sample along with SRM 1950 Metabolites in Human Plasma which was distributed as the control sample. Candidate SRM 2378 consists of three serum materials collected from: donors who have not taken fish or flaxseed oil supplements for one month prior to collection; donors who have taken flaxseed oil supplements for a minimum of one month prior to collection; and donors who have taken fish oil supplements for a minimum of one month prior to collection. SRM 1950 is designed to represent “normal” human plasma. Plasma was obtained from 100 individuals (equal number of men and women in a narrow age range (40 to 50 years) who had undergone an overnight fast prior to blood draw. Certified and reference values are provided for selected fatty acids on the Certificate of Analysis for SRM 1950(https://www-s.nist.gov/srmors/view_detail.cfm?srm=1950).

The laboratories were provided with four vials of each material and were requested to do triplicate measurements for each material (SRM 1950 and three levels of SRM 2378) using their laboratory's and/or program's analytical protocols, for the concentrations of the fatty acids currently being determined in their laboratory. A target list of compounds is presented in Table 1; however, participants did not need to quantify all of these compounds and could add additional compounds when reporting data. They were requested to report results, using three significant figures, in triplicate per analyte for each level of candidate SRM 2378 and for SRM 1950 in units of either $\mu\text{g/g}$ or $\mu\text{mol/L}$ and to provide brief descriptions of their cleanup and analytical procedures.

REPORTED RESULTS

Laboratories were assigned numerical identification codes in order of receipt of data with the exception of the NIST laboratory which is Lab 1 in this exercise. The laboratory mean replicate data are shown in Tables 2 to 5 for SRM 2378-1, SRM 2378-2, SRM 2378-3, and SRM 1950, respectively. Included in these tables are the laboratory mean values, standard deviations, and relative standard deviations both in the units that were reported and in a common unit, $\mu\text{mol/L}$. Summaries of the methods used by each laboratory are in Appendix A as well as charts of the mean numerical results reported by each laboratory for each analyte in the exercise materials.

DISCUSSION

NIST, CDC, and NIH's ODS contacted over 30 laboratories in early 2012 regarding participation in an interlaboratory analytical comparison study of total fatty acid concentrations in human serum. Of the laboratories contacted, 13 replied with interest in participating in this study and received samples in May 2012. The deadline for receipt of data was July 31, 2102. At that point, however, only seven laboratories had returned data so the deadline was extended with four additional laboratories submitting data. An alphabetical list of laboratories who returned data is given in Appendix B. Please note that the numerical codes in the following tables and figures are based on the receipt of the data and therefore do not follow the order in Appendix B.

Laboratories were requested to submit data for the fatty acids that they typically monitor in similar samples (suggested list in Table 1) for three subsamples of each sample received (SRM 1950 and three levels of candidate SRM 2378) in units of either $\mu\text{g/g}$ or $\mu\text{mol/L}$ along with the density of each sample. Summaries of the results submitted by each laboratory are presented in Tables 2 through 5 for SRM 2378-1, SRM 2378-2, SRM 2378-3, and SRM 1950, respectively. In Table 5, the certified and reference values for SRM 1950 are also summarized for comparison. The data from each laboratory are presented in the tables as the means, standard deviations, and relative standard deviations for the three values submitted. Four laboratories reported the data in $\mu\text{g/g}$ (shown in red in Tables 2 through 5). These data were converted to $\mu\text{mol/L}$ using the densities provided by each laboratory except for lab 9. Lab 9 did not report a density so the density was assumed to be 1 g/mL for the conversion to $\mu\text{mol/L}$.

The relative standard deviations (RSDs) for the laboratory data are generally < 20 %. Lab 3 had a few analytes with higher RSDs (up to 41 %) as did lab 4 (up to 36 %), lab 7 (up to 60 %), lab 8 (up to 31 %), and lab 9 (up to 27 %), but these were generally based on a limited number of analytes in each sample. Labs 3 and 4 reported data for three fatty acids not included in Table 1, Lab 7 reported data for nine additional fatty acids, and Lab 11 reported data for 10 additional fatty acids. The additional analytes and data are summarized in Table 6.

The data are plotted by analyte in material in the chart section of Appendix A. Each data point is the mean and associated standard deviation of the data reported by the laboratory of the indicated analyte in the indicated sample. The medians calculated from the data received for the fatty acid in each sample are summarized in Table 7 and included for each chart in a text box. Note that after an initial look at the data, Lab 8's data were not included in the median calculations since their data were substantially lower (in many cases an order of magnitude lower) than the consensus data from the other laboratories. The charts for SRM 1950 also include the reference or certified values in the chart title for comparison purposes.

In addition to nomenclature, Table 1 summarizes the number of laboratories reporting data for each fatty acid in each material, the range of mean values reported, and the lab number reporting the highest and lowest values for each fatty acid in each material. Note that lab 8 was included in the summation of the number of laboratories reporting data (including LOD and LOQ) but not in the range of values or identification of lab number reporting the lowest value. Excluding lab 8's data, there are no trends in the data across all fatty acids. There are a few trends with individual fatty acid as can be noted in Table 1. For example, lab 10 reported the lowest mean value for myristic acid and myristoleic acid, and lab 2 reported the highest mean value for *cis*-vaccenic acid and arachidic acid.

This information is also presented in Table 8 as the percent difference for each laboratory mean ($n=3$) from the median data for the particular analyte in the indicated sample. There do appear to be certain trends for individual fatty acids as noted above with data from one or more laboratories being high or low for a particular fatty acid in all of the materials studied. These results could be obtained by incomplete extraction (low), coelution with other fatty acids or matrix components on the analytical column used (high), or from some other method variations such as inaccurate calibration. The methods used by each laboratory are summarized in Appendix A with the procedures in Table A-1 and the

calibration information in Table A-2. The hydrolysis and extraction methods were generally different among the laboratories with the exception being labs 3 and 4 reporting the use of very similar procedures. All laboratories used gas chromatography (GC) with either flame ionization detection (FID) or mass spectrometry (MS) following a derivatization. For the calibration information (Table A-2), most laboratories used a linear regression with the exception of lab 6 which used a quadratic regression, lab 9 which reported only a weighting factor, lab 10 which did a one point calibration, and lab 11 used a mix of linear and quadratic regression tailored by analyte. Labs 5 and 7 did not report calibration information.

Intercomparison exercises provide an important mechanism for assessing the comparability, repeatability, and trueness of data being produced by the participating laboratories. Exercise materials similar in matrix, form, and analyte concentration to typical samples routinely analyzed by the laboratories are most useful for demonstrating the level of comparability and for revealing potential measurement and method problems. The data from this exercise can be used to assess the comparability across a limited number of international laboratories (see Appendix B). The data do not indicate specific method biases but do indicate the need for such intercomparisons and for the use of control materials to increase the comparability of data across laboratories.

Acknowledgments

The time and effort of the analysts and management of the participating laboratories are gratefully acknowledged.

Disclaimer

Certain commercial equipment, instruments, or materials are identified in this report to specify adequately the experimental procedure. Such identification does not imply recommendation or endorsement by the National Institute of Standards and Technology, nor does it imply that the materials or equipment identified are the best available for the purpose.

Table 1. Nomenclature used in this study and summary of values reported							
		mol wt		# Labs	range reported	lab reporting	lab reporting
		g/mol	material	reporting	(μ mol/L)	highest value ^a	lowest value ^a
C14:0	Myristic acid	228.38	SRM 2378-1	11	128-286	7	10
			SRM 2378-2	11	86.4-175	5	10
			SRM 2378-3	11	88.2-224	7	10
			SRM 1950	11	61.4-162	7	10
C14:1n5	Myristoleic acid	226.38	SRM 2378-1	8	7.31-28.5	7	10
			SRM 2378-2	8	5.49-19.3	2	10
			SRM 2378-3	8	5.69-24.5	7	10
			SRM 1950	8	4.31-16.5	7	10
C16:0	Palmitic acid	256.43	SRM 2378-1	11	1473-3884	7	2
			SRM 2378-2	11	1523-3680	5	2
			SRM 2378-3	11	1307-3186	7	2
			SRM 1950	11	1273-3058	7	2
C16:1n7	Palmitoleic acid	254.43	SRM 2378-1	11	55.1-252	5	7
			SRM 2378-2	11	63.9-333	5	7
			SRM 2378-3	11	58.6-228	5	7
			SRM 1950	11	61.6-338	5	7
C18:0	Stearic acid	284.48	SRM 2378-1	11	694-1154	7	2
			SRM 2378-2	11	696-1122	5	10
			SRM 2378-3	11	587-1069	7	10
			SRM 1950	11	526-932	7	10
C18:1n7	<i>cis</i> - Vaccenic acid	282.48	SRM 2378-1	9	118-234	2	3
			SRM 2378-2	9	109-264	2	3
			SRM 2378-3	9	92.5-212	2	3
			SRM 1950	9	129-295	2	1
C18:1n9	Oleic acid	282.48	SRM 2378-1	11	1113-2788	7	2
			SRM 2378-2	11	1303-3285	5	2
			SRM 2378-3	11	1077-2603	7	2
			SRM 1950	11	1113-2513	7	2
C18:2n6	Linoleic acid	280.48	SRM 2378-1	11	2631-4228	7	10
			SRM 2378-2	11	3180-5328	5	7
			SRM 2378-3	11	2331-4024	5	10
			SRM 1950	11	2081-3776	7	10
C18:3n3	<i>alpha</i> - Linolenic acid	278.48	SRM 2378-1	11	79.2-147	7	4
			SRM 2378-2	11	78.7-130	5	10
			SRM 2378-3	11	40.8-84.6	7	4
			SRM 1950	11	36.6-76.2	7	10
C18:3n6	<i>gamma</i> - Linolenic acid	278.48	SRM 2378-1	11	30.8-57.5	7	10
			SRM 2378-2	11	54.4-93.9	5	10
			SRM 2378-3	11	34.0-66.2	7	10
			SRM 1950	11	36.6-72.9	7	10
C20:0	Arachidic acid	312.54	SRM 2378-1	10	15.8-68.0	2	4
			SRM 2378-2	10	15.2-78.3	2	4
			SRM 2378-3	10	12.5-59.0	2	4
			SRM 1950	10	11.5-51.7	2	4
C20:1n9	11-Eicosenoic acid	310.54	SRM 2378-1	9	11.8-48.1	7	4
			SRM 2378-2	9	12.2-37.3	7	10
			SRM 2378-3	9	13.1-29.1	7	10
			SRM 1950	9	10.3-27.4	7	4

Table 1 (cont). Nomenclature used in this study and summary of values reported							
		mol wt		# Labs	range reported	reported	reported
		g/mol	material	reporting	(μmol/L)	highest value ^a	lowest value ^a
C20:2n6	11,14-Eicosadienoic acid	308.53	SRM 2378-1	8	8.50-19.8	3	7
			SRM 2378-2	8	5.98-25.8	5	7
			SRM 2378-3	8	6.59-22.5	5	7
			SRM 1950	8	7.78-22.4	5	7
C20:3n6	<i>homo-gamma</i> - Linolenic acid	306.53	SRM 2378-1	10	59.3-158	7	2
			SRM 2378-2	10	89.3-231	5	2
			SRM 2378-3	10	62.0-176	7	2
			SRM 1950	10	68.0-204	7	2
C20:4n6	Arachidonic acid	304.52	SRM 2378-1	11	493-987	2	4
			SRM 2378-2	11	646-1330	2	10
			SRM 2378-3	11	569-1127	2	10
			SRM 1950	11	540-1067	2	10
C20:5n3	Eicosapentaenoic acid (EPA)	302.52	SRM 2378-1	11	228-370	2	10
			SRM 2378-2	11	62.6-115	2	10
			SRM 2378-3	11	50.8-87.0	2 and 7	10
			SRM 1950	11	35.8-61.7	7	10
C22:0	Docosanoic acid	340.59	SRM 2378-1	11	5.02-67.1	10	7
			SRM 2378-2	11	2.37-92.7	11	7
			SRM 2378-3	11	3.53-61.0	11	7
			SRM 1950	11	2.95-52.1	11	7
C22:1n9	Docosenoic acid	338.59	SRM 2378-1	7	3.24-19	9	10
			SRM 2378-2	7	2.20-16.3	9	10
			SRM 2378-3	7	2.09-19.9	9	10
			SRM 1950	7	2.12-20.7	9	10
C22:4n6	Docosatetraenoic acid	332.57	SRM 2378-1	10	9.00-29.9	9	2
			SRM 2378-2	10	17.7-41.8	9	2
			SRM 2378-3	10	12.3-32.6	9	2
			SRM 1950	10	12.7-41.2	7	5
C22:5n3	Docosapentaenoic acid	330.57	SRM 2378-1	11	52.0-99.8	7	2 and 4
			SRM 2378-2	11	39.0-55.9	5	4
			SRM 2378-3	11	27.0-50.6	7	4
			SRM 1950	11	32.7-59.5	7	2
C22:5n6	Docosapentaenoic acid	330.57	SRM 2378-1	9	6.00-12.8	7	2
			SRM 2378-2	9	9.67-16.7	7	2
			SRM 2378-3	9	8.67-21.1	7	2
			SRM 1950	9	11.7-27.3	7	2
C22:6n3	Docosahexaenoic acid (DHA)	328.57	SRM 2378-1	11	241-450	7	4
			SRM 2378-2	11	136-195	7	10
			SRM 2378-3	11	124-251	7	4
			SRM 1950	11	82.3-170	7	10
C24:0	Lignoceric acid	368.64	SRM 2378-1	11	3.77-70.0	10	7
			SRM 2378-2	11	2.61-81.9	10	7
			SRM 2378-3	11	4.10-56.5	10	7
			SRM 1950	11	2.47-47.3	10	7
C24:1n9	Nervonic acid	366.63	SRM 2378-1	10	18.2-104	10	3
			SRM 2378-2	10	20.4-86.4	11	4
			SRM 2378-3	10	13.1-63.8	10	4
			SRM 1950	10	16.0-72.1	10	3
^a Excluding data submitted by Lab 8							

units reported	µg/g Lab 1			µmol/L Lab 2			µmol/L Lab 3			µmol/L Lab 4			µg/g Lab 5		
	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd
C14:0	47.2	1.7	3.68%	196	4	2.04%	188	5	2.81%	155	5	2.94%	50.5	0.8	1.49%
C14:1n5	4.12	0.20	4.77%	21.7	1.2	5.33%	NA						3.22	0.09	2.80%
C16:0	918	26	2.83%	1473	15	1.04%	2650	62	2.35%	2822	59	2.10%	936	18	1.92%
C16:1n7	53.1	3.8	7.16%	207	12	5.59%	187	8	4.21%	196	6	3.26%	65.3	1.5	2.30%
C18:0	240	5	1.91%	694	14	2.05%	737	20	2.69%	761	18	2.39%	280	4.2	1.50%
C18:1n7	46.7	4.0	8.51%	234	12	5.00%	118	5	4.41%	NA			57.9	1.0	1.73%
C18:1n9	550	14	2.59%	1113	25	2.26%	1776	34	1.90%	1830	67	3.66%	691	11	1.59%
C18:2n6	1099	6	0.51%	3403	68	2.00%	3092	55	1.79%	2738	163	5.95%	1150	20	1.74%
C18:3n3	35.1	3.1	8.93%	104	1	0.55%	89.0	2.7	3.04%	79.2	1.2	1.50%	34.5	0.7	1.88%
C18:3n6	13.3	0.7	5.12%	42.0	1.0	2.38%	38.7	1.5	3.91%	37.7	1.9	5.00%	14.7	0.3	1.97%
C20:0	6.65	0.34	5.07%	68.0	2.0	2.94%	27.2	1.2	4.29%	15.8	0.9	5.79%	6.56	0.15	2.29%
C20:1n9	5.48	0.35	6.43%	NA			18.0	3.9	21.85%	11.8	0.7	5.57%	5.35	0.05	0.93%
C20:2n6	NA			NA			19.8	0.9	4.55%	19.7	1.3	6.58%	6.19	0.28	4.52%
C20:3n6	NA			59.3	1.5	2.57%	101	5	5.36%	87.8	3.4	3.85%	37.7	0.3	0.66%
C20:4n6	209	8	3.98%	987	10	1.03%	528	15	2.91%	493	29	5.84%	223	2	0.94%
C20:5n3	93.8	1.7	1.84%	370	7	1.99%	244	11	4.57%	236	10	4.33%	94.3	0.7	0.70%
C22:0	14.9	0.1	0.91%	42.3	0.6	1.30%	16.0	1.0	6.52%	21.5	4.3	20.27%	14.6	1.0	7.12%
C22:1n9	2.51	0.24	9.66%	7.33	0.58	7.87%	NA			NA			2.52	0.49	19.44%
C22:4n6	NA			9.00	0.00	0.00%	11.5	1.1	9.56%	10.3	0.7	6.83%	5.53	0.70	12.66%
C22:5n3	20.4	0.8	3.90%	52.0	7.5	14.52%	65.0	4.2	6.44%	52.0	1.8	3.44%	24.4	0.5	2.05%
C22:5n6	NA			6.00	0.00	0.00%	7.32	2.54	34.66%	8.00	0.73	9.15%	3.10	0.08	2.58%
C22:6n3	108	3	2.66%	356	3	0.74%	287	7	2.40%	241	8	3.47%	111	2	1.35%
C24:0	14.3	0.7	5.16%	46.5	0.3	0.62%	12.4	2.3	18.36%	9.42	1.16	12.28%	14.3	0.9	6.29%
C24:1n9	21.3	1.2	5.45%	63.3	1.5	2.41%	18.2	2.9	15.90%	21.7	6.4	29.69%	21.0	1.6	7.62%

units reported	µmol/L Lab 6			µg/g Lab 7			µmol/L Lab 8			µg/g Lab 9			µmol/L Lab 10			µmol/L Lab 11		
	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd
C14:0	189	4	2.20%	65.6	2.4	3.67%	17.3	0.3	1.93%	44.8	0.493821	1.10%	128	3	2.72%	198	1	0.54%
C14:1n5	NA			6.48	0.66	10.14%	<LOD			3.51	0.07	1.91%	7.31	0.66	8.98%	12.3	0.3	2.58%
C16:0	2977	74	2.48%	1000	13	1.30%	387	29	7.61%	774	7	0.84%	2290	37	1.62%	3113	20	0.64%
C16:1n7	210	4	1.98%	14.1	1.4	9.94%	6.04	0.93	15.39%	53.1	0.5	1.00%	150	3	2.26%	207	2	0.74%
C18:0	806	4	0.45%	330	8	2.30%	102	5	5.25%	240	2	0.71%	696	15	2.18%	714	9	1.26%
C18:1n7	143	3	1.85%	42.6	11.3	26.54%	43.3	7.4	17.12%	ND			138	3	2.19%	136	3	1.97%
C18:1n9	2017	55	2.73%	791	25	3.12%	71.7	5.6	7.80%	636	5	0.71%	1602	23	1.42%	2076	19	0.92%
C18:2n6	3387	112	3.32%	1191	2	0.13%	130	41	31.08%	955	7	0.77%	2631	29	1.10%	3422	32	0.94%
C18:3n3	104	2	2.01%	41.1	0.5	1.14%	<LOD			30.5	0.2	0.78%	80.6	0.4	0.51%	112	1	0.46%
C18:3n6	40.8	0.9	2.23%	16.1	0.8	4.94%	5.18	0.96	18.45%	12.1	0.0	0.11%	30.8	0.3	1.03%	40.3	0.2	0.48%
C20:0	NA			8.76	0.46	5.25%	<LOD			8.59	0.66	7.64%	25.9	0.6	2.48%	24.9	0.5	1.89%
C20:1n9	NA			15.0	8.7	57.67%	<LOD			4.96	0.27	5.36%	16.2	0.3	1.71%	16.3	0.2	1.21%
C20:2n6	NA			2.63	0.58	22.14%	<LOD			6.04	0.25	4.19%	14.0	0.6	4.04%	17.4	0.4	2.41%
C20:3n6	104	2	1.46%	48.8	0.2	0.39%	6.53	0.96	14.68%	32.8	0.2	0.54%	94.8	2.5	2.61%	102	1	1.37%
C20:4n6	625	13	2.06%	277	3	0.99%	29.9	2.3	7.55%	194	1	0.41%	533	9	1.68%	634	3	0.53%
C20:5n3	257	5	2.06%	112	0	0.13%	9.83	1.09	11.13%	81.4	0.6	0.71%	228	2	0.96%	272	7	2.41%
C22:0	44.5	1.1	2.47%	1.72	0.35	20.38%	<LOD			15.7	1.3	8.08%	67.1	0.8	1.24%	58.7	0.8	1.29%
C22:1n9	NA						<LOD			6.42	0.71	10.99%	3.24	0.26	7.91%	4.21	0.62	14.70%
C22:4n6	12.4	0.2	1.40%	7.18	0.66	9.19%	<LOD			9.93	0.91	9.19%	13.1	0.1	0.97%	12.4	0.11	0.85%
C22:5n3	66.2	1.4	2.12%	33.1	1.0	3.14%	<LOQ			21.8	0.5	2.30%	65.7	2.3	3.50%	70.5	0.5	0.64%
C22:5n6	NA			4.26	0.23	5.40%	<LOD			3.01	0.09	3.12%	8.00	0.32	4.00%	8.37	0.26	3.06%
C22:6n3	283	7	2.47%	149	2	1.31%	13.0	0.8	6.34%	98.2	2.5	2.56%	276	7	2.45%	320	6	1.96%
C24:0	42.2	0.5	1.09%	1.39	0.24	17.00%	<LOD			15.7	1.5	9.78%	70.0	1.1	1.55%	56.2	0.4	0.39%
C24:1n9	62.5	2.7	4.28%				<LOD			21.0	1.6	7.66%	104	1	1.43%	87.1	0.8	0.80%
NOTE for Lab 9:																		
C18:1n9 Oleic acid Total 18:1 determined & entered																		
C20:1n9 11-Eicosenoic acid Total 20:1 determined & entered																		
C22:1n9 Docosenoic acid Total 22:1 determined & entered																		

Table 2 (Continued) Interlaboratory data received for SRM 2378-1															
	Lab 1			Lab 2			Lab 3			Lab 4			Lab 5		
	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd
density (g/mL)	1.02	0.00	0.01%	not reported			0.989	0.030	3.06%	not reported			0.983	0.035	3.56%
CONVERT ALL TO µmol/L															
	Lab 1			Lab 2			Lab 3			Lab 4			Lab 5		
	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd
C14:0	211	8	3.68%	196	4	2.04%	188	5	2.81%	155	5	2.94%	217	3	1.49%
C14:1n5	18.6	0.9	4.77%	21.7	1.2	5.33%	NA						14.0	0.4	2.80%
C16:0	3661	103	2.83%	1473	15	1.04%	2650	62	2.35%	2822	59	2.10%	3588	69	1.92%
C16:1n7	213	15	7.16%	207	12	5.59%	187	8	4.21%	196	6	3.26%	252	6	2.30%
C18:0	863	16	1.91%	694	14	2.05%	737	20	2.69%	761	18	2.39%	968	15	1.50%
C18:1n7	169	14	8.51%	234	12	5.00%	118	5	4.41%	NA			201	3	1.73%
C18:1n9	1990	51	2.59%	1113	25	2.26%	1776	34	1.90%	1830	67	3.66%	2405	38	1.59%
C18:2n6	4007	20	0.51%	3403	68	2.00%	3092	55	1.79%	2738	163	5.95%	4030	70	1.74%
C18:3n3	129	12	8.93%	104	1	0.55%	89.0	2.7	3.04%	79.2	1.2	1.50%	122	2	1.88%
C18:3n6	48.9	2.5	5.12%	42.0	1.0	2.38%	38.7	1.5	3.91%	37.7	1.9	5.00%	51.9	1.0	1.97%
C20:0	21.7	1.1	5.07%	68.0	2.0	2.94%	27.2	1.2	4.29%	15.8	0.9	5.79%	20.6	0.5	2.29%
C20:1n9	18.1	1.2	6.43%	NA			18.0	3.9	21.85%	11.8	0.7	5.57%	16.9	0.2	0.93%
C20:2n6	NA			NA			19.8	0.9	4.55%	19.7	1.3	6.58%	19.7	0.9	4.52%
C20:3n6	NA			59.3	1.5	2.57%	101	5	5.36%	87.8	3.4	3.85%	121	1	0.66%
C20:4n6	703	28	3.98%	987	10	1.03%	528	15	2.91%	493	29	5.84%	720	7	0.94%
C20:5n3	317	6	1.84%	370	7	1.99%	244	11	4.57%	236	10	4.33%	306	2	0.70%
C22:0	44.8	0.4	0.91%	42.3	0.6	1.30%	16.0	1.0	6.52%	21.5	4.3	20.27%	42.1	3.0	7.12%
C22:1n9	7.57	0.73	9.66%	7.33	0.58	7.87%	NA			NA			7.32	1.42	19.44%
C22:4n6	NA			9.00	0.00	0.00%	11.5	1.1	9.56%	10.3	0.7	6.83%	16.3	2.1	12.66%
C22:5n3	63.2	2.5	3.90%	52.0	7.5	14.52%	65.0	4.2	6.44%	52.0	1.8	3.44%	72.6	1.5	2.05%
C22:5n6	NA			6.00	0.00	0.00%	7.32	2.54	34.66%	8.00	0.73	9.15%	9.22	0.24	2.58%
C22:6n3	337	9	2.66%	356	3	0.74%	287	7	2.40%	241	8	3.47%	332	4	1.35%
C24:0	39.6	2.0	5.16%	46.5	0.3	0.62%	12.4	2.3	18.36%	9.42	1.16	12.28%	38.1	2.4	6.29%
C24:1n9	59.3	3.2	5.45%	63.3	1.5	2.41%	18.2	2.9	15.90%	21.7	6.4	29.69%	56.3	4.3	7.62%

Table 2 (Continued) Interlaboratory data received for SRM 2378-1																		
	Lab 6			Lab 7			Lab 8			Lab 9			Lab 10			Lab 11		
	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd
density (g/mL)	1.04	0.00	0.41%	0.996	0.010	0.95%	1.00	0.00	0.01%	not reported use 1						0.967	0.005	0.52%
CONVERT ALL TO µmol/L																		
	Lab 6			Lab 7			Lab 8			Lab 9			Lab 10			Lab 11		
	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd
C14:0	189	4	2.20%	286	11	3.67%	17.3	0.3	1.93%	196	2	1.10%	128	3	2.72%	198	1	0.54%
C14:1n5	NA			28.5	2.9	10.14%	<LOD			15.5	0.3	1.91%	7.31	0.66	8.98%	12.3	0.3	2.58%
C16:0	2977	74	2.48%	3884	50	1.30%	387	29	7.61%	3019	25	0.84%	2290	37	1.62%	3113	20	0.64%
C16:1n7	210	4	1.98%	55.1	5.5	9.94%	6.04	0.93	15.39%	209	2	1.00%	150	3	2.26%	207	2	0.74%
C18:0	806	4	0.45%	1154	27	2.30%	102	5	5.25%	842	6	0.71%	696	15	2.18%	714	9	1.26%
C18:1n7	143	3	1.85%	150	40	26.54%	43.3	7.4	17.12%	NA			138	3	2.19%	136	3	1.97%
C18:1n9	2017	55	2.73%	2788	87	3.12%	71.7	5.6	7.80%	2250	16	0.71%	1602	23	1.42%	2076	19	0.92%
C18:2n6	3387	112	3.32%	4228	6	0.13%	130	41	31.08%	3403	26	0.77%	2631	29	1.10%	3422	32	0.94%
C18:3n3	104	2	2.01%	147	2	1.14%	<LOD			110	1	0.78%	80.6	0.4	0.51%	112	1	0.46%
C18:3n6	40.8	0.9	2.23%	57.5	2.8	4.94%	5.18	0.96	18.45%	43.5	0.0	0.11%	30.8	0.3	1.03%	40.3	0.2	0.48%
C20:0	NA			27.9	1.5	5.25%	<LOD			27.5	2.1	7.64%	25.9	0.6	2.48%	24.9	0.5	1.89%
C20:1n9	NA			48.1	27.7	57.67%	<LOD			16.0	0.9	5.36%	16.2	0.3	1.71%	16.3	0.2	1.21%
C20:2n6	NA			8.50	1.88	22.14%	<LOD			19.6	0.8	4.19%	14.0	0.6	4.04%	17.4	0.4	2.41%
C20:3n6	104	2	1.46%	158	1	0.39%	6.53	0.96	14.68%	107	1	0.54%	94.8	2.5	2.61%	102	1	1.37%
C20:4n6	625	13	2.06%	908	9	0.99%	29.9	2.3	7.55%	637	3	0.41%	533	9	1.68%	634	3	0.53%
C20:5n3	257	5	2.06%	368	0	0.13%	9.83	1.09	11.13%	269	2	0.71%	228	2	0.96%	272	7	2.41%
C22:0	44.5	1.1	2.47%	5.02	1.02	20.38%	<LOD			46.2	3.7	8.08%	67.1	0.8	1.24%	58.7	0.8	1.29%
C22:1n9	NA						<LOD			19.0	2.1	10.99%	3.24	0.26	7.91%	4.21	0.62	14.70%
C22:4n6	12.4	0.2	1.40%	21.5	2.0	9.19%	<LOD			29.9	2.7	9.19%	13.1	0.1	0.97%	12.4	0.11	0.85%
C22:5n3	66.2	1.4	2.12%	99.8	3.1	3.14%	<LOQ			66.1	1.5	2.30%	65.7	2.3	3.50%	70.5	0.5	0.64%
C22:5n6	NA			12.8	0.7	5.40%	<LOD			9.12	0.28	3.12%	8.00	0.32	4.00%	8.37	0.26	3.06%
C22:6n3	283	7	2.47%	450	6	1.31%	13.0	0.8	6.34%	299	8	2.56%	276	7	2.45%	320	6	1.96%
C24:0	42.2	0.5	1.09%	3.77	0.64	17.00%	<LOD			42.5	4.2	9.78%	70.0	1.1	1.55%	56.2	0.4	0.39%
C24:1n9	62.5	2.7	4.28%				<LOD			57.3	4.4	7.66%	104	1	1.43%	87.1	0.8	0.80%
NOTE for Lab 9:																		
C18:1n9 Oleic acid										Total 18:1 determined & entered								
C20:1n9 11-Eicosenoic acid										Total 20:1 determined & entered								
C22:1n9 Docosenoic acid										Total 22:1 determined & entered								

units reported	µg/g Lab 1			µmol/L Lab 2			µmol/L Lab 3			µmol/L Lab 4			µg/g Lab 5		
	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd
C14:0	35.4	2.4	6.82%	158	1	0.45%	153	8	5.41%	126	8	6.13%	39.6	2.0	5.16%
C14:1n5	3.38	0.28	8.18%	19.3	0.6	2.99%	NA						2.55	0.12	4.71%
C16:0	719	22	3.13%	1523	32	2.11%	2811	122	4.35%	2762	142	5.15%	935	26	2.78%
C16:1n7	71.5	1.9	2.72%	264	13	4.74%	262	16	5.99%	242	11	4.57%	84.0	2.1	2.46%
C18:0	246	7	2.88%	785	22	2.80%	864	29	3.41%	848	55	6.49%	316	10	3.01%
C18:1n7	31.5	1.4	4.48%	264	4	1.33%	109	7	6.46%	NA			62.0	0.8	1.32%
C18:1n9	707	10	1.36%	1303	64	4.93%	2611	152	5.81%	2461	214	8.68%	919	13	1.41%
C18:2n6	1194	51	4.24%	4067	64	1.58%	4378	255	5.83%	3615	415	11.48%	1480	20	1.35%
C18:3n3	31.0	1.2	3.77%	116	5	3.88%	96.6	6.8	7.04%	86.6	9.5	10.99%	36.0	0.5	1.25%
C18:3n6	20.4	1.0	4.82%	82.0	4.6	5.59%	71.3	7.7	10.81%	65.0	5.6	8.58%	25.9	0.3	1.24%
C20:0	7.05	0.37	5.20%	78.3	2.3	2.95%	28.7	3.8	13.15%	15.2	3.5	23.05%	7.39	0.66	8.93%
C20:1n9	4.92	0.23	4.63%	NA			20.7	2.4	11.59%	12.3	1.2	9.45%	5.24	0.20	3.72%
C20:2n6	NA			NA			24.5	1.8	7.40%	17.4	0.8	4.82%	7.90	0.15	1.90%
C20:3n6	NA			89.3	1.2	1.29%	200	11	5.42%	167	14	8.36%	70.1	0.6	0.84%
C20:4n6	225	8	3.61%	1330	56	4.19%	746	36	4.88%	668	72	10.74%	293	3	0.86%
C20:5n3	21.9	0.6	2.67%	115	3	2.79%	64.4	9.1	14.10%	76.2	6.3	8.28%	24.7	0.2	0.81%
C22:0	21.1	1.3	5.99%	59.2	0.3	0.54%	27.8	6.2	22.35%	33.9	5.2	15.32%	21.2	2.0	9.42%
C22:1n9	2.50	0.06	2.54%	7.00	0.00	0.00%	NA			NA			3.15	0.12	3.81%
C22:4n6	NA			17.7	0.6	3.27%	21.0	3.2	15.04%	17.8	2.3	12.94%	7.66	1.03	13.45%
C22:5n3	17.8	0.2	0.87%	45.3	4.0	8.91%	49.3	3.8	7.81%	39.0	1.7	4.30%	18.3	0.5	2.73%
C22:5n6	NA			9.67	1.53	15.80%	12.0	1.5	12.18%	13.4	0.7	4.84%	5.13	0.20	3.90%
C22:6n3	58.0	3.0	5.19%	184	13	7.11%	163	10	6.28%	145	2	1.43%	59.3	0.4	0.61%
C24:0	16.1	1.9	11.57%	60.2	1.5	2.45%	18.4	7.2	39.06%	21.2	0.9	4.42%	17.1	2.2	13.01%
C24:1n9	17.6	1.0	5.83%	67.3	2.1	3.09%	21.9	9.0	41.35%	20.4	6.0	29.67%	18.8	1.9	9.88%

units reported	µmol/L Lab 6			µg/g Lab 7			µmol/L Lab 8			µg/g Lab 9			µmol/L Lab 10			µmol/L Lab 11		
	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd
C14:0	142	3	2.11%	35.0	3.4	9.60%	19.9	1.0	4.80%	34.3	1.1	3.20%	86.4	0.8	0.88%	152	1	0.63%
C14:1n5	NA			3.42	0.31	8.95%	<LOD			2.75	0.19	6.86%	5.49	0.62	11.35%	9.24	0.16	1.68%
C16:0	2963	87	2.95%	717	85	11.81%	299	16	5.24%	768	31	4.07%	2057	15	0.72%	3151	20	0.62%
C16:1n7	266	7	2.56%	16.3	1.7	10.47%	8.08	0.81	10.07%	65.7	2.8	4.20%	182	3	1.80%	264	4	1.48%
C18:0	905	12	1.33%	285	27	9.47%	102	10	9.86%	264	12	4.69%	696	4	0.64%	808	3	0.38%
C18:1n7	146	0	0.00%	33.5	3.1	9.13%	36.2	2.4	6.55%	ND			130	8	6.06%	140	1	0.90%
C18:1n9	2680	85	3.19%	702	87	12.45%	127	7	5.79%	827	29	3.51%	1984	23	1.17%	2764	23	0.84%
C18:2n6	4353	172	3.96%	896	100	11.12%	100	6	6.44%	1221	41	3.38%	3200	40	1.24%	4479	37	0.81%
C18:3n3	108	2	1.85%	29.9	4.7	15.80%	<LOD			31.2	1.7	5.36%	78.7	0.7	0.85%	118	1	1.25%
C18:3n6	74.3	1.2	1.62%	15.3	2.3	14.92%	5.47	0.29	5.26%	21.2	0.7	3.54%	54.4	1.1	2.07%	76.3	0.7	0.87%
C20:0	NA			7.84	1.12	14.25%	<LOD			10.6	1.6	15.29%	26.1	0.4	1.64%	29.4	0.3	0.84%
C20:1n9	NA			11.6	3.82	32.85%	<LOD			4.46	0.53	11.95%	12.2	0.4	3.13%	16.0	0.3	1.96%
C20:2n6	NA			1.86	0.51	27.55%	<LOD			7.66	0.45	5.92%	19.4	0.5	2.82%	23.1	0.2	0.87%
C20:3n6	189	3	1.52%	64.5	7.1	11.06%	7.94	0.50	6.32%	58.1	3.3	5.62%	156	2	1.25%	196	7	3.35%
C20:4n6	823	17	2.07%	239	26	10.89%	33.9	1.8	5.20%	247	15	6.03%	646	9	1.42%	856	8	0.94%
C20:5n3	68.5	1.1	1.55%	20.7	1.9	8.95%	<LOD			20.4	1.5	7.59%	62.6	0.2	0.30%	71.9	0.5	0.73%
C22:0	69.7	1.9	2.66%	0.810	0.072	8.89%	<LOD			22.7	3.8	16.55%	88.6	1.6	1.85%	92.7	1.2	1.30%
C22:1n9	NA						<LOD			5.52	1.11	20.05%	2.20	0.31	14.02%	4.46	0.32	7.19%
C22:4n6	21.3	0.8	3.79%	9.14	0.85	9.24%	<LOD			13.9	0.7	5.23%	20.2	0.5	2.55%	23.0	1.3	5.81%
C22:5n3	48.3	1.1	2.28%	17.8	2.7	15.16%	<LOD			15.3	0.9	6.03%	44.3	0.3	0.69%	52.1	1.2	2.35%
C22:5n6	NA			5.54	1.17	21.13%	<LOD			4.39	1.17	26.73%	14.5	0.3	2.35%	16.1	0.5	3.14%
C22:6n3	156	3	1.85%	64.3	5.4	8.45%	4.53	0.61	13.44%	52.5	3.3	6.27%	136	2	1.31%	179	1	0.33%
C24:0	58.3	2.5	4.23%	0.966	0.065	6.73%	<LOD			20.0	3.6	17.87%	81.9	2.7	3.29%	78.0	1.0	1.33%
C24:1n9	61.6	3.4	5.44%				<LOD			19.4	3.7	19.12%	84.4	1.7	1.99%	86.4	2.6	2.95%
NOTE for Lab 9:																		
C18:1n9 Oleic acid Total 18:1 determined & entered																		
C20:1n9 11-Eicosenoic acid Total 20:1 determined & entered																		
C22:1n9 Docosenoic acid Total 22:1 determined & entered																		

Table 3 (continued) Interlaboratory data received for SRM 2378-2															
	Lab 1			Lab 2			Lab 3			Lab 4			Lab 5		
	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd
density (g/mL)	1.02	0.00	0.01%	not reported			1.06	0.04	3.45%	not reported			1.01	0.02	2.03%
CONVERT ALL TO µmol/L															
	Lab 1			Lab 2			Lab 3			Lab 4			Lab 5		
	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd
C14:0	158	11	6.82%	158	1	0.45%	153	8	5.41%	126	8	6.13%	175	9	5.16%
C14:1n5	15.3	1.2	8.18%	19.3	0.6	2.99%	NA						11.4	0.5	4.71%
C16:0	2870	90	3.13%	1523	32	2.11%	2811	122	4.35%	2762	142	5.15%	3680	102	2.78%
C16:1n7	288	8	2.72%	264	13	4.74%	262	16	5.99%	242	11	4.57%	333	8	2.46%
C18:0	886	26	2.88%	785	22	2.80%	864	29	3.41%	848	55	6.49%	1122	34	3.01%
C18:1n7	114	5	4.48%	264	4	1.33%	109	7	6.46%	NA			222	3	1.32%
C18:1n9	2561	35	1.36%	1303	64	4.93%	2611	152	5.81%	2461	214	8.68%	3285	46	1.41%
C18:2n6	4355	185	4.24%	4067	64	1.58%	4378	255	5.83%	3615	415	11.48%	5328	72	1.35%
C18:3n3	114	4	3.77%	116	5	3.88%	96.6	6.8	7.04%	86.6	9.5	10.99%	130	2	1.25%
C18:3n6	74.8	3.6	4.82%	82.0	4.6	5.59%	71.3	7.7	10.81%	65.0	5.6	8.58%	93.9	1.2	1.24%
C20:0	23.1	1.2	5.20%	78.3	2.3	2.95%	28.7	3.8	13.15%	15.2	3.5	23.05%	23.9	2.1	8.93%
C20:1n9	16.2	0.8	4.63%	NA			20.7	2.4	11.59%	12.3	1.2	9.45%	17.0	0.6	3.72%
C20:2n6	NA			NA			24.5	1.8	7.40%	17.4	0.8	4.82%	25.8	0.5	1.90%
C20:3n6	NA			89.3	1.2	1.29%	200	11	5.42%	167	14	8.36%	231	2	0.84%
C20:4n6	757	27	3.61%	1330	56	4.19%	746	36	4.88%	668	72	10.74%	972	8	0.86%
C20:5n3	74.0	2.0	2.67%	115	3	2.79%	64.4	9.1	14.10%	76.2	6.3	8.28%	82.4	0.7	0.81%
C22:0	63.5	3.8	5.99%	59.2	0.3	0.54%	27.8	6.2	22.35%	33.9	5.2	15.32%	62.9	5.9	9.42%
C22:1n9	7.54	0.19	2.54%	7.00	0.00	0.00%	NA			NA			9.39	0.36	3.81%
C22:4n6	NA			17.7	0.6	3.27%	21.0	3.2	15.04%	17.8	2.3	12.94%	23.3	3.1	13.45%
C22:5n3	55.0	0.5	0.87%	45.3	4.0	8.91%	49.3	3.8	7.81%	39.0	1.7	4.30%	55.9	1.5	2.73%
C22:5n6	NA			9.67	1.53	15.80%	12.0	1.5	12.18%	13.4	0.7	4.84%	15.7	0.6	3.90%
C22:6n3	181	9	5.19%	184	13	7.11%	163	10	6.28%	145	2	1.43%	182	1	0.61%
C24:0	44.7	5.2	11.57%	60.2	1.5	2.45%	18.4	7.2	39.06%	21.2	0.9	4.42%	46.8	6.1	13.01%
C24:1n9	49.2	2.9	5.83%	67.3	2.1	3.09%	21.9	9.0	41.35%	20.4	6.0	29.67%	51.9	5.1	9.88%

Table 3 (continued) Interlaboratory data received for SRM 2378-2																		
	Lab 6			Lab 7			Lab 8			Lab 9			Lab 10			Lab 11		
	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd
density (g/mL)	1.04	0.00	0.14%	0.995	0.016	1.60%	1.00	0.00	0.01%	not reported use 1						0.983	0.006	0.64%
CONVERT ALL TO µmol/L																		
	Lab 6			Lab 7			Lab 8			Lab 9			Lab 10			Lab 11		
	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd
C14:0	142	3	2.11%	152	15	9.60%	19.9	1.0	4.80%	150	5	3.20%	86.4	0.8	0.88%	152	1	0.63%
C14:1n5	NA			15.0	1.3	8.95%	<LOD			12.1	0.8	6.86%	5.49	0.62	11.35%	9.24	0.16	1.68%
C16:0	2963	87	2.95%	2782	329	11.81%	299	16	5.24%	2995	122	4.07%	2057	15	0.72%	3151	20	0.62%
C16:1n7	266	7	2.56%	63.9	6.7	10.47%	8.08	0.81	10.07%	258	11	4.20%	182	3	1.80%	264	4	1.48%
C18:0	905	12	1.33%	997	94	9.47%	102	10	9.86%	928	44	4.69%	696	4	0.64%	808	3	0.38%
C18:1n7	146	0	0.00%	118	11	9.13%	36.2	2.4	6.55%	NA			130	8	6.06%	140	1	0.90%
C18:1n9	2680	85	3.19%	2473	308	12.45%	127	7	5.79%	2927	103	3.51%	1984	23	1.17%	2764	23	0.84%
C18:2n6	4353	172	3.96%	3180	354	11.12%	100	6	6.44%	4354	147	3.38%	3200	40	1.24%	4479	37	0.81%
C18:3n3	108	2	1.85%	107	17	15.80%	<LOD			112	6	5.36%	78.7	0.7	0.85%	118	1	1.25%
C18:3n6	74.3	1.2	1.62%	54.5	8.1	14.92%	5.47	0.29	5.26%	76.1	2.7	3.54%	54.4	1.1	2.07%	76.3	0.7	0.87%
C20:0	NA			25.0	3.6	14.25%	<LOD			34.0	5.2	15.29%	26.1	0.4	1.64%	29.4	0.3	0.84%
C20:1n9	NA			37.3	12.2	32.85%	<LOD			14.4	1.7	11.95%	12.2	0.4	3.13%	16.0	0.3	1.96%
C20:2n6	NA			5.98	1.65	27.55%	<LOD			24.8	1.5	5.92%	19.4	0.5	2.82%	23.1	0.2	0.87%
C20:3n6	189	3	1.52%	209	23	11.06%	7.94	0.50	6.32%	190	11	5.62%	156	2	1.25%	196	7	3.35%
C20:4n6	823	17	2.07%	780	85	10.89%	33.9	1.8	5.20%	813	49	6.03%	646	9	1.42%	856	8	0.94%
C20:5n3	68.5	1.1	1.55%	68.0	6.1	8.95%	<LOD			67.4	5.1	7.59%	62.6	0.2	0.30%	71.9	0.5	0.73%
C22:0	69.7	1.9	2.66%	2.37	0.21	8.89%	<LOD			66.7	11.0	16.55%	88.6	1.6	1.85%	92.7	1.2	1.30%
C22:1n9	NA						<LOD			16.3	3.3	20.05%	2.20	0.31	14.02%	4.46	0.32	7.19%
C22:4n6	21.3	0.8	3.79%	27.3	2.5	9.24%	<LOD			41.8	2.2	5.23%	20.2	0.5	2.55%	23.0	1.3	5.81%
C22:5n3	48.3	1.1	2.28%	53.5	8.1	15.16%	<LOD			46.4	2.8	6.03%	44.3	0.3	0.69%	52.1	1.2	2.35%
C22:5n6	NA			16.7	3.5	21.13%	<LOD			13.3	3.6	26.73%	14.5	0.3	2.35%	16.1	0.5	3.14%
C22:6n3	156	3	1.85%	195	16	8.45%	4.53	0.61	13.44%	160	10	6.27%	136	2	1.31%	179	1	0.33%
C24:0	58.3	2.5	4.23%	2.61	0.18	6.73%	<LOD			54.3	9.7	17.87%	81.9	2.7	3.29%	78.0	1.0	1.33%
C24:1n9	61.6	3.4	5.44%				<LOD			52.9	10.1	19.12%	84.4	1.7	1.99%	86.4	2.6	2.95%
NOTE for Lab 9:																		
C18:1n9 Oleic acid											Total 18:1 determined & entered							
C20:1n9 11-Eicosenoic acid											Total 20:1 determined & entered							
C22:1n9 Docosenoic acid											Total 22:1 determined & entered							

units reported	µg/g			µmol/L			µmol/L			µmol/L			µg/g		
	Lab 1			Lab 2			Lab 3			Lab 4			Lab 5		
	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd
C14:0	34.1	2.0	5.75%	158	3	1.60%	163	2	1.52%	129	6	4.58%	40.1	0.7	1.84%
C14:1n5	4.02	0.29	7.31%	19.3	0.6	2.99%	NA						2.81	0.18	6.41%
C16:0	774	11	1.47%	1307	29	2.21%	2401	28	1.16%	2495	141	5.66%	780	7	0.83%
C16:1n7	49.4	1.7	3.51%	174	8	4.83%	180	2	1.13%	175	5	3.02%	56.7	0.5	0.79%
C18:0	207	10	4.88%	663	10	1.44%	742	8	1.08%	736	31	4.26%	265	2	0.87%
C18:1n7	36.3	3.2	8.94%	212	5	2.33%	92.5	2.4	2.59%	NA			51.3	0.7	1.36%
C18:1n9	603	16	2.57%	1077	61	5.68%	1841	26	1.43%	1769	108	6.12%	649	7	1.11%
C18:2n6	931	27	2.91%	3327	107	3.21%	3282	53	1.63%	2689	200	7.44%	1103	6	0.53%
C18:3n3	16.9	0.2	1.36%	61.0	1.7	2.84%	51.6	1.1	2.20%	40.8	2.4	5.89%	19.3	0.4	1.87%
C18:3n6	15.1	0.4	2.41%	50.3	0.6	1.15%	46.6	1.8	3.86%	41.9	1.9	4.44%	17.8	0.4	2.24%
C20:0	10.1	0.2	1.57%	59.0	1.0	1.69%	30.6	4.1	13.29%	12.5	1.8	14.17%	6.06	0.27	4.41%
C20:1n9	5.49	0.09	1.64%	NA			20.7	1.4	6.73%	14.4	1.9	13.24%	5.62	0.30	5.34%
C20:2n6	NA			NA			20.5	0.4	2.11%	16.6	1.8	10.98%	6.79	0.12	1.77%
C20:3n6	NA			62.0	1.0	1.61%	126	2	1.31%	102	7	6.42%	43.5	0.6	1.47%
C20:4n6	245	12	5.10%	1127	12	1.02%	691	13	1.89%	596	36	5.97%	264	2	0.76%
C20:5n3	21.0	0.5	2.61%	87.0	7.2	8.29%	59.8	3.2	5.40%	61.4	2.2	3.63%	21.5	0.5	2.10%
C22:0	14.8	0.3	2.02%	42.2	1.0	2.34%	20.7	5.0	24.11%	28.0	2.2	7.97%	14.6	0.9	5.83%
C22:1n9	2.83	0.07	2.36%	6.00	0.00	0.00%	NA			NA			3.07	0.07	2.28%
C22:4n6	NA			12.3	0.6	4.68%	19.7	2.7	13.82%	13.1	0.5	3.62%	4.51	0.46	10.08%
C22:5n3	10.5	0.1	0.63%	28.7	0.6	2.01%	36.7	1.3	3.67%	27.0	2.1	7.96%	12.7	1.0	8.19%
C22:5n6	NA			8.67	0.58	6.66%	12.7	2.6	20.27%	11.5	2.4	20.79%	4.84	0.05	1.05%
C22:6n3	51.1	0.6	1.13%	157	7	4.18%	173	2	1.03%	124	3	2.04%	59.9	0.4	0.70%
C24:0	12.5	0.1	0.70%	43.4	1.0	2.32%	16.5	3.4	20.60%	16.3	1.2	7.33%	11.0	0.6	5.55%
C24:1n9	13.6	0.9	6.60%	48.3	2.1	4.31%	15.9	1.0	6.39%	13.1	1.9	14.58%	14.2	0.4	2.82%

units reported	µmol/L			µg/g			µmol/L			µg/g			µmol/L			µmol/L		
	Lab 6			Lab 7			Lab 8			Lab 9			Lab 10			Lab 11		
	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd
C14:0	149	3	1.69%	51.7	1.5	2.98%	22.9	1.9	8.24%	35.8	2.3	6.36%	88.2	1.2	1.40%	157	2	1.12%
C14:1n5	NA			5.62	0.72	12.73%	<LOD			2.82	0.09	3.14%	5.69	0.28	4.97%	10.4	0.1	0.79%
C16:0	2473	67	2.69%	827	18	2.22%	300	19	6.22%	644	27	4.27%	1719	15	0.85%	2592	23	0.88%
C16:1n7	181	5	2.49%	15.1	0.5	3.44%	8.23	1.02	12.35%	44.7	1.9	4.36%	120	3	2.30%	177	0	0.27%
C18:0	781	10	1.26%	308	5	1.48%	93.6	12.5	13.32%	221	11	4.75%	587	7	1.24%	657	12	1.81%
C18:1n7	118	2	1.69%	34.9	12.6	36.00%	39.6	2.7	6.81%	ND			107	4	3.77%	110	1	0.95%
C18:1n9	1927	40	2.10%	744	21	2.85%	101	7	7.13%	585	31	5.31%	1386	4	0.31%	1938	16	0.82%
C18:2n6	3343	121	3.61%	1128	50	4.43%	115	9	7.94%	906	47	5.16%	2331	16	0.68%	3328	21	0.64%
C18:3n3	57.8	1.4	2.40%	23.9	1.6	6.88%	<LOD			17.4	0.6	3.49%	41.3	0.2	0.59%	62.6	0.6	0.93%
C18:3n6	50.3	1.6	3.08%	18.7	0.8	4.16%	<LOD			14.4	0.9	6.25%	34.0	0.1	0.38%	51.3	0.7	1.35%
C20:0	NA			10.3	0.5	4.93%	<LOD			8.64	1.80	20.81%	19.2	0.4	1.88%	21.2	0.4	1.87%
C20:1n9	NA			9.16	3.54	38.65%	<LOD			4.10	0.07	1.59%	13.1	0.3	2.02%	16.8	0.1	0.57%
C20:2n6	NA			2.06	0.43	20.84%	<LOD			6.62	0.31	4.72%	16.0	0.3	2.00%	19.6	0.1	0.61%
C20:3n6	117	2	1.31%	54.6	1.5	2.67%	5.04	0.29	5.73%	36	1	3.78%	95.4	1.2	1.31%	121	0	0.29%
C20:4n6	799	17	2.07%	322	11	3.45%	32.1	2.0	6.10%	222	11	4.81%	569	3	0.60%	768	7	0.92%
C20:5n3	62.9	1.0	1.66%	26.6	0.6	2.06%	<LOD			18.1	0.7	4.05%	50.8	0.7	1.35%	62.2	1.0	1.65%
C22:0	47.0	1.1	2.37%	1.22	0.64	52.34%	<LOD			15.9	0.2	1.25%	59.8	0.9	1.55%	61.0	0.2	0.29%
C22:1n9	NA						<LOD			6.74	1.07	15.83%	2.09	0.08	3.79%	5.03	0.51	10.20%
C22:4n6	17.0	0.2	1.36%	9.91	0.10	0.96%	<LOD			10.8	1.2	10.78%	16.1	0.2	1.17%	18.6	0.3	1.78%
C22:5n3	33.1	0.7	2.09%	16.9	0.9	5.35%	<LOD			10.24	0.36	3.48%	29.3	0.6	2.05%	36.4	1.1	2.98%
C22:5n6	NA			7.06	0.41	5.78%	<LOD			4.57	0.55	12.02%	13.8	0.5	3.48%	16.0	0.5	3.28%
C22:6n3	157	3	1.69%	83.6	3.2	3.85%	5.89	0.35	5.89%	51.6	2.7	5.19%	134	0	0.35%	177	2	1.27%
C24:0	39.5	0.4	1.10%	1.53	0.28	18.51%	<LOD			15.2	0.8	5.03%	56.5	1.8	3.13%	53.2	0.3	0.58%
C24:1n9	43.6	1.8	4.05%				<LOD			15.4	0.3	1.90%	63.8	1.3	2.05%	63.5	1.1	1.68%
NOTE for Lab 9:																		
C18:1n9 Oleic acid Total 18:1 determined & entered																		
C20:1n9 11-Eicosenoic acid Total 20:1 determined & entered																		
C22:1n9 Docosenoic acid Total 22:1 determined & entered																		

Table 4 (continued) Interlaboratory data received for SRM 2378-3															
	Lab 1			Lab 2			Lab 3			Lab 4			Lab 5		
	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd
density (g/mL)	1.02	0.00	0.00%	not reported			1.08	0.02	1.86%	not reported			1.02	0.01	0.56%
CONVERT ALL TO µmol/L															
	Lab 1			Lab 2			Lab 3			Lab 4			Lab 5		
	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd
C14:0	152	9	5.75%	158	3	1.60%	163	2	1.52%	129	6	4.58%	180	3	1.84%
C14:1n5	18.2	1.3	7.31%	19.3	0.6	2.99%	NA						12.7	0.8	6.41%
C16:0	3085	45	1.47%	1307	29	2.21%	2401	28	1.16%	2495	141	5.66%	3113	26	0.83%
C16:1n7	199	7	3.51%	174	8	4.83%	180	2	1.13%	175	5	3.02%	228	2	0.79%
C18:0	745	36	4.88%	663	10	1.44%	742	8	1.08%	736	31	4.26%	953	8	0.87%
C18:1n7	131	12	8.94%	212	5	2.33%	92.5	2.4	2.59%	NA			186	3	1.36%
C18:1n9	2183	56	2.57%	1077	61	5.68%	1841	26	1.43%	1769	108	6.12%	2351	26	1.11%
C18:2n6	3393	99	2.91%	3327	107	3.21%	3282	53	1.63%	2689	200	7.44%	4024	21	0.53%
C18:3n3	62.2	0.8	1.36%	61.0	1.7	2.84%	51.6	1.1	2.20%	40.8	2.4	5.89%	70.9	1.3	1.87%
C18:3n6	55.5	1.3	2.41%	50.3	0.6	1.15%	46.6	1.8	3.86%	41.9	1.9	4.44%	65.5	1.5	2.24%
C20:0	33.1	0.5	1.57%	59.0	1.0	1.69%	30.6	4.1	13.29%	12.5	1.8	14.17%	19.8	0.9	4.41%
C20:1n9	18.1	0.3	1.64%	NA			20.7	1.4	6.73%	14.4	1.9	13.24%	18.5	1.0	5.34%
C20:2n6	NA			NA			20.5	0.4	2.11%	16.6	1.8	10.98%	22.5	0.4	1.77%
C20:3n6	NA			62.0	1.0	1.61%	126	2	1.31%	102	7	6.42%	145	2	1.47%
C20:4n6	822	42	5.10%	1127	12	1.02%	691	13	1.89%	596	36	5.97%	887	7	0.76%
C20:5n3	70.9	1.8	2.61%	87.0	7.2	8.29%	59.8	3.2	5.40%	61.4	2.2	3.63%	72.6	1.5	2.10%
C22:0	44.4	0.9	2.02%	42.2	1.0	2.34%	20.7	5.0	24.11%	28.0	2.2	7.97%	43.8	2.6	5.83%
C22:1n9	8.53	0.20	2.36%	6.00	0.00	0.00%	NA			NA			9.28	0.21	2.28%
C22:4n6	NA			12.3	0.6	4.68%	19.7	2.7	13.82%	13.1	0.5	3.62%	13.9	1.4	10.08%
C22:5n3	32.3	0.2	0.63%	28.7	0.6	2.01%	36.7	1.3	3.67%	27.0	2.1	7.96%	39.3	3.2	8.19%
C22:5n6	NA			8.67	0.58	6.66%	12.7	2.6	20.27%	11.5	2.4	20.79%	15.0	0.2	1.05%
C22:6n3	159	2	1.13%	157	7	4.18%	173	2	1.03%	124	3	2.04%	186	1	0.70%
C24:0	34.7	0.2	0.70%	43.4	1.0	2.32%	16.5	3.4	20.60%	16.3	1.2	7.33%	30.5	1.7	5.55%
C24:1n9	37.9	2.5	6.60%	48.3	2.1	4.31%	15.9	1.0	6.39%	13.1	1.9	14.58%	39.5	1.1	2.82%

Table 4 (continued) Interlaboratory data received for SRM 2378-3																		
	Lab 6			Lab 7			Lab 8			Lab 9			Lab 10			Lab 11		
	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd
density (g/mL)	1.04	0.00	0.47%	0.988	0.010	1.00%	1.02	0.00	0.01%	not reported use 1						0.987	0.001	0.06%
CONVERT ALL TO µmol/L																		
	Lab 6			Lab 7			Lab 8			Lab 9			Lab 10			Lab 11		
	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd
C14:0	149	3	1.69%	224	7	2.98%	22.9	1.9	8.24%	157	10	6.36%	88.2	1.2	1.40%	157	2	1.12%
C14:1n5	NA			24.5	3.1	12.73%	<LOD			12.4	0.4	3.14%	5.69	0.28	4.97%	10.4	0.1	0.79%
C16:0	2473	67	2.69%	3186	71	2.22%	300	19	6.22%	2511	107	4.27%	1719	15	0.85%	2592	23	0.88%
C16:1n7	181	5	2.49%	58.6	2.0	3.44%	8.23	1.02	12.35%	176	8	4.36%	120	3	2.30%	177	0	0.27%
C18:0	781	10	1.26%	1069	16	1.48%	93.6	12.5	13.32%	777	37	4.75%	587	7	1.24%	657	12	1.81%
C18:1n7	118	2	1.69%	122	44	36.00%	39.6	2.7	6.81%	NA			107	4	3.77%	110	1	0.95%
C18:1n9	1927	40	2.10%	2603	74	2.85%	101	7	7.13%	2071	110	5.31%	1386	4	0.31%	1938	16	0.82%
C18:2n6	3343	121	3.61%	3973	176	4.43%	115	9	7.94%	3231	167	5.16%	2331	16	0.68%	3328	21	0.64%
C18:3n3	57.8	1.4	2.40%	84.6	5.8	6.88%	<LOD			62.6	2.2	3.49%	41.3	0.2	0.59%	62.6	0.6	0.93%
C18:3n6	50.3	1.6	3.08%	66.2	2.8	4.16%	<LOD			51.7	3.2	6.25%	34.0	0.1	0.38%	51.3	0.7	1.35%
C20:0	NA			32.4	1.6	4.93%	<LOD			27.6	5.8	20.81%	19.2	0.4	1.88%	21.2	0.4	1.87%
C20:1n9	NA			29.1	11.3	38.65%	<LOD			13.2	0.2	1.59%	13.1	0.3	2.02%	16.8	0.1	0.57%
C20:2n6	NA			6.59	1.37	20.84%	<LOD			21.5	1.0	4.72%	16.0	0.3	2.00%	19.6	0.1	0.61%
C20:3n6	117	2	1.31%	176	5	2.67%	5.04	0.29	5.73%	116	4	3.78%	95.4	1.2	1.31%	121	0	0.29%
C20:4n6	799	17	2.07%	1045	36	3.45%	32.1	2.0	6.10%	728	35	4.81%	569	3	0.60%	768	7	0.92%
C20:5n3	62.9	1.0	1.66%	87.00	1.80	2.06%	<LOD			59.7	2.4	4.05%	50.8	0.7	1.35%	62.2	1.0	1.65%
C22:0	47.0	1.1	2.37%	3.53	1.85	52.34%	<LOD			46.7	0.6	1.25%	59.8	0.9	1.55%	61.0	0.2	0.29%
C22:1n9	NA			<LOD			<LOD			19.9	3.1	15.83%	2.09	0.08	3.79%	5.03	0.51	10.20%
C22:4n6	17.0	0.2	1.36%	29.4	0.3	0.96%	<LOD			32.6	3.5	10.78%	16.1	0.2	1.17%	18.6	0.3	1.78%
C22:5n3	33.1	0.7	2.09%	50.6	2.7	5.35%	<LOD			31.0	1.1	3.48%	29.3	0.6	2.05%	36.4	1.1	2.98%
C22:5n6	NA			21.1	1.2	5.78%	<LOD			13.8	1.7	12.02%	13.8	0.5	3.48%	16.0	0.5	3.28%
C22:6n3	157	3	1.69%	251	10	3.85%	5.89	0.35	5.89%	157	8	5.19%	134	0	0.35%	177	2	1.27%
C24:0	39.5	0.4	1.10%	4.10	0.76	18.51%	<LOD			41.2	2.1	5.03%	56.5	1.8	3.13%	53.2	0.3	0.58%
C24:1n9	43.6	1.8	4.05%	<LOD			<LOD			41.9	0.8	1.90%	63.8	1.3	2.05%	63.5	1.1	1.68%
NOTE for Lab 9:																		
C18:1n9 Oleic acid										Total 18:1 determined & entered								
C20:1n9 11-Eicosenoic acid										Total 20:1 determined & entered								
C22:1n9 Docosenoic acid										Total 22:1 determined & entered								

Table 5. Interlaboratory data received for SRM 1950

units reported	μmol/L COA			μg/g Lab 1			μmol/L Lab 2			μmol/L Lab 3			μmol/L Lab 4			μg/g Lab 5		
	Cert/ref	unc	rel unc	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd
C14:0	80.1	17	21.22%	26.2	0.3	1.02%	115	4	3.06%	111	4	3.50%	98.7	2.2	2.25%	26.7	0.4	1.35%
C14:1n5	7.1	0.1	1.41%	1.90	0.03	1.69%	16.3	0.6	3.53%	NA						1.80	0.08	4.17%
C16:0	2364	77	3.26%	624	14	2.28%	1273	25	1.98%	2210	105	4.73%	2532	70	2.77%	737	7	0.90%
C16:1n7	215	26	12.09%	56.1	0.8	1.43%	252	2	0.69%	271	13	4.98%	271	2	0.58%	84.8	1.0	1.12%
C18:0	644	41	6.37%	174	8	4.36%	612	16	2.59%	652	45	6.91%	707	23	3.20%	237	2	0.88%
C18:1n7	136	3	2.21%	35.6	0.9	2.39%	295	4	1.22%	131	7	5.05%	NA			64.8	0.6	0.94%
C18:1n9	1614	154	9.54%	451	12	2.59%	1113	21	1.87%	1717	63	3.70%	1868	40	2.13%	643	5	0.80%
C18:2n6	2838	143	5.04%	879	9	1.08%	3030	98	3.25%	2806	104	3.69%	2607	110	4.22%	991	10	0.98%
C18:3n3	54.6	3.6	6.59%	16.8	0.4	2.63%	52.7	0.6	1.10%	44.7	1.2	2.68%	43.2	0.9	2.07%	17.2	0.3	1.86%
C18:3n6	39.9	8.5	21.30%	13.4	0.1	0.97%	55.3	1.5	2.76%	46.5	2.6	5.49%	47.5	2.8	5.93%	18.1	0.1	0.32%
C20:0	18.0	0.5	2.78%	5.57	0.05	0.81%	51.7	1.2	2.23%	21.1	4.2	19.70%	11.5	1.2	10.42%	4.44	0.50	11.26%
C20:1n9	11.5	0.5	4.35%	3.44	0.19	5.57%	NA			15.5	4.4	28.53%	10.3	0.9	8.85%	4.14	0.21	5.07%
C20:2n6	18.8	0.6	3.19%	NA			NA			19.1	1.3	6.65%	18.8	1.1	6.09%	6.82	0.07	1.03%
C20:3n6	139	4	2.88%	NA			68.0	2.0	2.94%	141	4	2.78%	124	2	1.49%	50.3	0.7	1.33%
C20:4n6	984	180	18.29%	274	13	4.71%	1067	15	1.43%	627	23	3.74%	625	10	1.59%	253	3	0.99%
C20:5n3	38.6	0.5	1.30%	12.3	0.5	4.01%	60.7	2.1	3.43%	37.4	2.1	5.56%	53.0	6.1	11.59%	14.3	0.3	1.82%
C22:0	47.8	6.0	12.55%	12.3	0.4	3.01%	37.1	0.6	1.48%	16.6	4.7	28.07%	30.4	3.8	12.56%	11.1	1.2	10.48%
C22:1n9	3.4	1.3	38.24%	1.79	0.08	4.49%	8.00	0.00	0.00%	NA			NA			2.27	0.36	15.86%
C22:4n6	25.5	0.6	2.35%	NA			17.3	0.6	3.33%	25.7	3.5	13.53%	20.7	1.3	6.20%	4.17	0.17	4.08%
C22:5n3	38.5	0.7	1.82%	12.5	0.3	2.78%	32.7	1.2	3.53%	38.7	4.4	11.35%	33.4	2.2	6.72%	15.1	0.2	0.99%
C22:5n6	19.5	0.4	2.05%	NA			11.7	0.6	4.95%	16.5	2.1	12.90%	18.4	0.9	4.84%	6.74	0.20	2.97%
C22:6n3	118	21	17.80%	38.1	0.9	2.24%	94.3	2.9	3.06%	109	5	4.58%	89.8	2.0	2.26%	37.3	0.2	0.46%
C24:0	46.6	2.6	5.58%	15.7	0.3	1.63%	38.0	1.1	2.77%	10.9	4.0	36.37%	13.0	1.5	11.21%	10.2	0.7	6.55%
C24:1n9	71.3	3.2	4.49%	17.1	0.3	1.64%	51.7	3.1	5.91%	16.0	3.4	20.96%	19.3	3.8	19.64%	14.7	1.4	9.82%

Table 5 (Continued) Interlaboratory data received for SRM 1950

units reported	μmol/L Lab 6			μg/g Lab 7			μmol/L Lab 8			μg/g Lab 9			μmol/L Lab 10			μmol/L Lab 11		
	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd
C14:0	103	1	0.97%	37.3	3.9	10.45%	11.9	0.5	4.56%	25.0	0.3	1.06%	61.4	5.0	8.14%	112	3	2.36%
C14:1n5	NA			3.77	0.06	1.64%	<LOD			2.22	0.12	5.37%	4.31	0.66	15.24%	7.46	0.14	1.85%
C16:0	2343	58	2.46%	793	58	7.31%	341	6	1.87%	612	8	1.33%	1643	53	3.22%	2571	71	2.76%
C16:1n7	272	3	1.10%	15.9	0.7	4.26%	12.4	2.0	16.47%	75.2	1.9	2.58%	184	10	5.26%	277	6	2.17%
C18:0	679	8	1.11%	268	16	5.90%	113	4	3.31%	205	1	0.27%	526	6	1.21%	609	19	3.15%
C18:1n7	133	4	3.12%	54.0	14.0	25.86%	45.4	1.7	3.76%	ND			134	10	7.62%	131	3	2.61%
C18:1n9	1837	47	2.57%	718	65	9.03%	116	5	4.50%	608	3	0.46%	1363	80	5.90%	1906	38	2.01%
C18:2n6	2897	110	3.79%	1071	112	10.46%	134	5	3.96%	822	0	0.02%	2081	112	5.39%	3066	66	2.15%
C18:3n3	53.3	1.8	3.31%	21.5	1.9	8.99%	<LOD			15.6	0.1	0.82%	36.6	2.1	5.84%	57.6	1.0	1.67%
C18:3n6	52.5	1.8	3.37%	20.5	2.4	11.44%	4.48	0.52	11.62%	15.0	0.7	4.96%	36.6	2.8	7.66%	54.3	0.7	1.36%
C20:0	NA			11.7	0.7	6.11%	<LOD			7.97	0.45	5.61%	16.1	0.2	1.41%	18.1	0.5	2.74%
C20:1n9	NA			8.62	4.32	50.13%	<LOD			4.02	0.38	9.54%	10.5	1.0	9.56%	12.4	0.2	1.29%
C20:2n6	NA			2.43	0.27	11.00%	<LOQ			6.15	0.34	5.53%	15.9	0.2	1.04%	19.4	0.3	1.66%
C20:3n6	139	2	1.25%	63.2	3.7	5.84%	12.0	0.7	6.14%	41.9	0.3	0.83%	111	1	1.27%	146	2	1.45%
C20:4n6	704	14	2.04%	314	24	7.59%	57.4	1.0	1.68%	212	2	0.71%	540	16	2.97%	752	18	2.37%
C20:5n3	42.0	1.3	3.10%	18.9	1.8	9.59%	<LOD			12.3	0.5	4.34%	35.8	1.4	3.90%	42.2	2.0	4.72%
C22:0	37.5	0.6	1.61%	1.02	0.14	13.86%	<LOD			13.4	1.1	8.31%	49.1	0.5	1.10%	52.1	1.2	2.32%
C22:1n9	NA						<LOD			7.01	0.81	11.49%	2.12	0.11	5.03%	4.75	0.47	9.81%
C22:4n6	24.1	0.5	1.87%	13.9	1.0	7.46%	1.67	0.06	3.88%	13.0	0.6	4.39%	22.4	0.6	2.50%	28.1	1.1	4.07%
C22:5n3	38.3	0.8	1.96%	19.9	0.8	4.08%	2.97	0.27	8.94%	12.7	0.1	0.55%	34.6	0.2	0.68%	42.2	1.5	3.54%
C22:5n6	NA			9.14	0.44	4.81%	<LOD			5.73	0.60	10.45%	18.0	1.3	7.21%	21.5	0.4	1.73%
C22:6n3	95.8	2.9	3.02%	56.4	4.6	8.14%	8.12	0.66	8.17%	32.8	1.3	4.00%	82.3	0.5	0.57%	113	3	2.66%
C24:0	32.1	0.7	2.08%	0.921	0.168	18.24%	<LOD			12.1	1.3	10.38%	47.3	0.2	0.48%	45.5	1.0	2.25%
C24:1n9	48.2	1.2	2.45%				<LOD			16.4	1.2	7.44%	72.1	3.1	4.32%	71.4	1.9	2.62%
NOTE for Lab 9:																		
										C18:1n9	Oleic acid		Total 18:1 determined & entered					
										C20:1n9	11-Eicosenoic acid		Total 20:1 determined & entered					
										C22:1n9	Docosenoic acid		Total 22:1 determined & entered					

Table 5 (Continued) Interlaboratory data received for SRM 1950																					
		Lab 1				Lab 2				Lab 3				Lab 4				Lab 5			
		mean	stdev	rsd		mean	stdev	rsd		mean	stdev	rsd		mean	stdev	rsd		mean	stdev	rsd	
density (g/mL)		1.02	0.00	0.00		not reported				1.04	0.02	1.78%		not reported				1.01	0.02	2.11%	
CONVERT ALL TO µmol/L																					
		Lab 1				Lab 2				Lab 3				Lab 4				Lab 5			
COA	Cert/ref	unc	rel unc	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd
C14:0	80.1	17	21.22%	117	1	1.02%	115	4	3.06%	111	4	3.50%	98.7	2.2	2.25%	118	2	1.35%			
C14:1n5	7.1	0.1	1.41%	8.55	0.14	1.69%	16.3	0.6	3.53%	NA			2532	70	2.77%	8.04	0.34	4.17%			
C16:0	2364	77	3.26%	2483	56	2.28%	1273	25	1.98%	2210	105	4.73%	271	2	0.58%	2911	26	0.90%			
C16:1n7	215	26	12.09%	225	3	1.43%	252	2	0.69%	271	13	4.98%	271	2	0.58%	338	4	1.12%			
C18:0	644	41	6.37%	623	27	4.36%	612	16	2.59%	652	45	6.91%	707	23	3.20%	844	7	0.88%			
C18:1n7	136	3	2.21%	129	3	2.39%	295	4	1.22%	131	7	5.05%	NA			232	2	0.94%			
C18:1n9	1614	154	9.54%	1629	42	2.59%	1113	21	1.87%	1717	63	3.70%	1868	40	2.13%	2305	18	0.80%			
C18:2n6	2838	143	5.04%	3198	34	1.08%	3030	98	3.25%	2806	104	3.69%	2607	110	4.22%	3578	35	0.98%			
C18:3n3	54.6	3.6	6.59%	61.5	1.6	2.63%	52.7	0.6	1.10%	44.7	1.2	2.68%	43.2	0.9	2.07%	62.5	1.2	1.86%			
C18:3n6	39.9	8.5	21.30%	49.2	0.5	0.97%	55.3	1.5	2.76%	46.5	2.6	5.49%	47.5	2.8	5.93%	65.7	0.2	0.32%			
C20:0	18.0	0.5	2.78%	18.2	0.1	0.81%	51.7	1.2	2.23%	21.1	4.2	19.70%	11.5	1.2	10.42%	14.4	1.6	11.26%			
C20:1n9	11.5	0.5	4.35%	11.3	0.6	5.57%	NA			15.5	4.4	28.53%	10.3	0.9	8.85%	13.5	0.7	5.07%			
C20:2n6	18.8	0.6	3.19%	NA			NA			19.1	1.3	6.65%	18.8	1.1	6.09%	22.4	0.2	1.03%			
C20:3n6	139	4	2.88%	NA			68.0	2.0	2.94%	141	4	2.78%	124	2	1.49%	166	2	1.33%			
C20:4n6	984	180	18.29%	917	43	4.71%	1067	15	1.43%	627	23	3.74%	625	10	1.59%	842	8	0.99%			
C20:5n3	38.6	0.5	1.30%	41.5	1.7	4.01%	60.7	2.1	3.43%	37.4	2.1	5.56%	53.0	6.1	11.59%	47.9	0.9	1.82%			
C22:0	47.8	6.0	12.55%	36.7	1.1	3.01%	37.1	0.6	1.48%	16.6	4.7	28.07%	30.4	3.8	12.56%	32.9	3.5	10.48%			
C22:1n9	3.4	1.3	38.24%	5.39	0.24	4.49%	8.00	0.00	0.00%	NA			NA			6.79	1.08	15.86%			
C22:4n6	25.5	0.6	2.35%	NA			17.3	0.6	3.33%	25.7	3.5	13.53%	20.7	1.3	6.20%	12.7	0.5	4.08%			
C22:5n3	38.5	0.7	1.82%	38.5	1.1	2.78%	32.7	1.2	3.53%	38.7	4.4	11.35%	33.4	2.2	6.72%	46.3	0.5	0.99%			
C22:5n6	19.5	0.4	2.05%	NA			11.7	0.6	4.95%	16.5	2.1	12.90%	18.4	0.9	4.82%	20.7	0.6	2.97%			
C22:6n3	118	21	17.80%	118	3	2.24%	94.3	2.9	3.06%	109	5	4.58%	89.8	2.0	2.26%	115	1	0.46%			
C24:0	46.6	2.6	5.58%	43.6	0.7	1.63%	38.0	1.1	2.77%	10.9	4.0	36.37%	13.0	1.5	11.21%	27.9	1.8	6.55%			
C24:1n9	71.3	3.2	4.49%	47.7	0.8	1.64%	51.7	3.1	5.91%	16.0	3.4	20.96%	19.3	3.8	19.64%	40.5	4.0	9.82%			

Table 5 (Continued) Interlaboratory data received for SRM 1950																		
	Lab 6			Lab 7			Lab 8			Lab 9			Lab 10			Lab 11		
	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd
density (g/mL)	1.04	0.00	0.21%	0.989	0.016	1.59%	0.997	0.000	0.01%	not reported use 1						0.973	0.008	0.86%
CONVERT ALL TO µmol/L																		
	Lab 6 mean	stdev	rsd	Lab 7 mean	stdev	rsd	Lab 8 mean	stdev	rsd	Lab 9 mean	stdev	rsd	Lab 10 mean	stdev	rsd	Lab 11 mean	stdev	rsd
C14:0	103	1	0.97%	162	17	10.45%	11.9	0.5	4.56%	109	1	1.06%	61.4	5.0	8.14%	112	3	2.36%
C14:1n5	NA			16.5	0.3	1.64%	<LOD			9.8	0.5	5.37%	4.31	0.66	15.24%	7.46	0.14	1.85%
C16:0	2343	58	2.46%	3058	224	7.31%	341	6	1.87%	2388	32	1.33%	1643	53	3.22%	2571	71	2.76%
C16:1n7	272	3	1.10%	61.6	2.6	4.26%	12.4	2.0	16.47%	296	8	2.58%	184	10	5.26%	277	6	2.17%
C18:0	679	8	1.11%	932	55	5.90%	113	4	3.31%	722	2	0.27%	526	6	1.21%	609	19	3.15%
C18:1n7	133	4	3.12%	189	49	25.86%	45.4	1.7	3.76%	NA			134	10	7.62%	131	3	2.61%
C18:1n9	1837	47	2.57%	2513	227	9.03%	116	5	4.50%	2152	10	0.46%	1363	80	5.90%	1906	38	2.01%
C18:2n6	2897	110	3.79%	3776	395	10.46%	134	5	3.96%	2932	1	0.02%	2081	112	5.39%	3066	66	2.15%
C18:3n3	53.3	1.8	3.31%	76.2	6.9	8.99%	<LOD			56.2	0.5	0.82%	36.6	2.1	5.84%	57.6	1.0	1.67%
C18:3n6	52.5	1.8	3.37%	72.9	8.3	11.44%	4.48	0.52	11.62%	53.9	2.7	4.96%	36.6	2.8	7.66%	54.3	0.7	1.36%
C20:0	NA			36.9	2.3	6.11%	<LOD			25.5	1.4	5.61%	16.1	0.2	1.41%	18.1	0.5	2.74%
C20:1n9	NA			27.4	13.8	50.13%	<LOD			12.9	1.2	9.54%	10.5	1.0	9.56%	12.4	0.2	1.29%
C20:2n6	NA			7.78	0.86	11.00%	<LOQ			19.9	1.1	5.53%	15.9	0.2	1.04%	19.4	0.3	1.66%
C20:3n6	139	2	1.25%	204	12	5.84%	12.0	0.7	6.14%	137	1	0.83%	111	1	1.27%	146	2	1.45%
C20:4n6	704	14	2.04%	1019	77	7.59%	57.4	1.0	1.68%	696	5	0.71%	540	16	2.97%	752	18	2.37%
C20:5n3	42.0	1.3	3.10%	61.7	5.9	9.59%	<LOD			40.6	1.8	4.34%	35.8	1.4	3.90%	42.2	2.0	4.72%
C22:0	37.5	0.6	1.61%	2.95	0.41	13.86%	<LOD			39.4	3.3	8.31%	49.1	0.5	1.10%	52.1	1.2	2.32%
C22:1n9	NA						<LOD			20.7	2.4	11.49%	2.12	0.11	5.03%	4.75	0.47	9.81%
C22:4n6	24.1	0.5	1.87%	41.2	3.1	7.46%	1.67	0.06	3.88%	38.9	1.7	4.39%	22.4	0.6	2.50%	28.1	1.1	4.07%
C22:5n3	38.3	0.8	1.96%	59.5	2.4	4.08%	2.97	0.27	8.94%	38.3	0.2	0.55%	34.6	0.2	0.68%	42.2	1.5	3.54%
C22:5n6	NA			27.3	1.3	4.81%	<LOD			17.3	1.8	10.45%	18.0	1.3	7.21%	21.5	0.4	1.73%
C22:6n3	95.8	2.9	3.02%	170	14	8.14%	8.12	0.66	8.17%	100	4	4.00%	82.3	0.5	0.57%	113	3	2.66%
C24:0	32.1	0.7	2.08%	2.47	0.45	18.24%	<LOD			33.0	3.4	10.38%	47.3	0.2	0.48%	45.5	1.0	2.25%
C24:1n9	48.2	1.2	2.45%				<LOD			44.7	3.3	7.44%	72.1	3.1	4.32%	71.4	1.9	2.62%
NOTE for Lab 9:																		
C18:1n9 Oleic acid										Total 18:1 determined & entered								
C20:1n9 11-Eicosenoic acid										Total 20:1 determined & entered								
C22:1n9 Docosenoic acid										Total 22:1 determined & entered								

Table 6. Additional Data (μmol/L) Reported														
Lab			Candidate SRM 2378-1			Candidate SRM 2378-2			Candidate SRM 2378-3			SRM 1950		
reporting	fatty acid (nomenclature supplied by lab)		mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd	mean	stdev	rsd
11	C8:0	Caprylic (octanoic)	7.72	1.30	16.85%	1.51	0.87	57.50%	1.68	1.65	98.42%	2.80	4.53	161.54%
11	C10:0	Capric (decanoic)	21.1	0.1	0.41%	1.89	0.34	17.75%	5.27	0.37	6.96%	2.70	0.30	11.01%
7	C12:0		57.4	2.4	4.15%	22.8	2.2	9.81%	52.3	1.5	2.90%	26.9	4.0	14.76%
11	C12:0	Lauric (dodecanoic)	27.4	0.3	1.24%	11.3	0.4	3.76%	28.1	0.3	1.23%	9.27	0.04	0.47%
7	C15:0		41.4	6.0	14.58%	36.9	7.1	19.13%	41.1	0.8	1.98%	30.2	1.3	4.26%
11	C15:0	Pentadecanoic	21.7	0.3	1.25%	28.5	0.3	0.94%	20.7	0.2	1.02%	16.3	0.5	3.06%
7	iso-C16:0		10.2	1.4	14.10%	7.72	1.43	18.55%	10.3	0.8	8.22%	7.52	0.67	8.93%
3	C16:1n7t	Palmitelaidic Acid	12.7	1.7	13.50%	29.3	3.6	12.22%	21.7	1.0	4.55%	23.1	3.9	16.93%
4	C16:1n7t	Palmitelaidic Acid	152	7	4.32%	159	6	4.01%	148	4	2.90%	158	4	2.49%
7	C16:1n-9		16.4	3.4	20.63%	21.2	5.1	24.29%	17.2	1.0	5.59%	31.2	2.1	6.59%
7	C16:1n-5		285	6	1.99%	234	27	11.61%	244	9	3.51%	382	38	9.93%
7	iso-C17:0		16.8	2.5	14.92%	15.2	0.7	4.71%	16.7	1.2	7.00%	10.6	1.5	14.53%
11	C17:0	Margaric (heptadecanoic)	26.9	0.7	2.68%	33.4	0.3	0.97%	26.5	0.6	2.13%	25.0	0.4	1.54%
3	C18:1t	total 18:1t	56.5	2.4	4.33%	94.1	0.6	0.68%	84.3	1.7	1.98%	132	8	5.79%
4	C18:1t		58.1	4.1	7.05%	98.3	3.7	3.72%	85.9	2.3	2.69%	123	5	4.09%
7	9t,11c 18:2		15.0	1.2	7.76%	6.52	0.66	10.07%	6.57	0.61	9.22%	6.48	0.43	6.59%
3	C18:2n6t	total 18:2t	41.1	0.1	0.35%	54.0	7.1	13.22%	46.0	1.6	3.40%	62.0	4.4	7.11%
4	C18:2n6t		31.1	0.7	2.12%	37.1	0.5	1.47%	25.9	5.1	19.72%	44.9	1.5	3.31%
11	C18:4n3	Stearidonic	8.13	0.46	5.70%	4.11	0.22	5.33%	2.83	0.07	2.44%	2.57	0.06	2.37%
7	C20:3n-9		24.2	1.7	7.21%	23.9	4.9	20.34%	21.7	6.5	30.10%	25.5	2.4	9.45%
11	C20:3n9	5Z, 8Z, 11Z-Eicosatrienoic	4.67	0.12	2.49%	7.10	0.09	1.31%	7.54	0.04	0.56%	8.66	0.29	3.32%
11	C20:3n6	homo-gamma-Linolenic	102	1	1.37%	196	7	3.35%	121	0	0.29%	146	2	1.45%
7	C22 4n-3		17.2	0.7	3.84%	13.4	3.6	26.94%	10.7	0.2	2.19%	10.8	0.3	2.49%
11	C23:0	Tricosanoic	23.6	0.2	0.91%	37.9	0.6	1.57%	22.3	0.1	0.34%	21.2	0.4	1.92%
11	C26:0	Hexacosanoic (cerotic)	0.891	0.049	5.54%	0.632	0.045	7.12%	0.863	0.089	10.33%	0.549	0.073	13.25%

Table 7. Consensus Medians (μmol/L) (excluding data from Lab 8) for each sample								
Fatty acid	SRM 2378-1		SRM 2378-2		SRM 2378-3		SRM 1950	
	median	n	median	n	median	n	median	n
C14:0	193	10	152	10	157	10	112	10
C14:1n5	14.0	7	12.1	7	12.7	7	8.55	7
C16:0	2899	10	2841	10	2503	10	2435	10
C16:1n7	201	10	263	10	176	10	271	10
C18:0	749	10	875	10	743	10	665	10
C18:1n7	141	8	135	8	120	8	134	8
C18:1n9	1910	10	2586	10	1932	10	1852	10
C18:2n6	3395	10	4354	10	3327	10	2981	10
C18:3n3	104	10	110	10	61.6	10	54.7	10
C18:3n6	40.5	10	74.5	10	50.8	10	53.2	10
C20:0	24.9	9	26.1	9	27.6	9	18.2	9
C20:1n9	16.3	8	16.1	8	17.4	8	12.7	8
C20:2n6	17.4	7	23.1	7	19.6	7	19.1	7
C20:3n6	101	9	190	9	117	9	139	9
C20:4n6	630	10	797	10	784	10	728	10
C20:5n3	263	10	70.2	10	62.5	10	42.1	10
C22:0	42.2	10	63.2	10	44.1	10	36.9	10
C22:1n9	5.76	6	7.27	6	7.27	6	6.09	6
C22:4n6	12.4	9	21.3	9	17.0	9	24.1	9
C22:5n3	65.4	10	48.8	10	32.7	10	38.4	10
C22:5n6	8.00	8	14.0	8	13.8	8	18.2	8
C22:6n3	293	10	171	10	158	10	104	10
C24:0	38.9	10	50.5	10	37.1	10	32.5	10
C24:1n9	57.3	9	52.9	9	41.9	9	47.7	9

Table 8. Percent differences of the Laboratory Means (n=3) from Median of Interlaboratory Data (See Table 7)

Laboratory #	Fatty acid	SRM 2378-1	SRM 2378-2	SRM 2378-3	SRM 1950	
Lab 1	C14:0	9.59%	4.11%	-2.91%	4.92%	
	C14:1n5	33.0%	25.7%	43.0%	0.00%	
	C16:0	26.3%	1.04%	23.3%	1.95%	
	C16:1n7	6.02%	9.53%	12.6%	-16.9%	
	C18:0	15.2%	1.27%	0.19%	-6.35%	
	C18:1n7	20.1%	-15.5%	9.49%	-3.89%	
	C18:1n9	4.18%	-0.97%	13.0%	-12.1%	
	C18:2n6	18.0%	0.02%	1.97%	7.28%	
	C18:3n3	24.0%	3.58%	0.94%	12.3%	
	C18:3n6	20.5%	0.37%	9.19%	-7.48%	
	C20:0	-12.7%	-11.5%	19.8%	0.00%	
	C20:1n9	11.1%	0.56%	3.67%	-10.7%	
	C20:2n6					
	C20:3n6					
	C20:4n6	11.6%	-4.94%	4.94%	26.0%	
	C20:5n3	20.5%	5.42%	13.3%	-1.34%	
	C22:0	6.24%	0.45%	0.71%	-0.56%	
	C22:1n9	31.4%	3.75%	17.4%	-11.5%	
	C22:4n6					
	C22:5n3	-3.32%	12.8%	-1.21%	0.17%	
	C22:5n6					
	C22:6n3	15.0%	5.53%	0.62%	13.5%	
	C24:0	1.94%	-11.5%	-6.41%	34.0%	
	C24:1n9	3.47%	-6.97%	-9.58%	0.00%	
Lab 2	C14:0	1.73%	3.52%	0.44%	2.78%	
	C14:1n5	55.0%	59.3%	52.2%	91.0%	
	C16:0	-49.2%	-46.4%	-47.8%	-47.7%	
	C16:1n7	3.02%	0.41%	-1.49%	-7.00%	
	C18:0	-7.38%	-10.3%	-10.8%	-8.04%	
	C18:1n7	66.6%	95.8%	76.4%	121%	
	C18:1n9	-41.7%	-49.6%	-44.3%	-39.9%	
	C18:2n6	0.25%	-6.59%	-0.02%	1.64%	
	C18:3n3	0.32%	5.73%	-0.94%	-3.76%	
	C18:3n6	3.62%	10.0%	-0.97%	3.96%	
	C20:0	173%	201%	113%	184%	
	C20:1n9					
	C20:2n6					
	C20:3n6	-41.3%	-52.9%	-46.9%	-51.1%	
	C20:4n6	56.7%	67.0%	43.8%	46.6%	
	C20:5n3	40.6%	64.3%	39.1%	44.2%	
	C22:0	0.15%	-6.31%	-4.36%	0.56%	
	C22:1n9	27.2%	-3.75%	-17.4%	31.4%	
	C22:4n6	-27.4%	-17.2%	-27.6%	-28.0%	
	C22:5n3	-20.5%	-7.04%	-12.3%	-14.9%	
	C22:5n6	-25.0%	-30.9%	-37.3%	-35.8%	
	C22:6n3	21.4%	7.33%	-0.62%	-9.49%	
	C24:0	19.7%	19.1%	17.0%	16.9%	
	C24:1n9	10.6%	27.2%	15.3%	8.28%	

Table 8 (cont). Percent differences of the Laboratory Means (n=3) from Median of Interlaboratory Data (See Table 7)

Lab 3	C14:0	-2.50%	0.25%	3.86%	-0.39%	
	C14:1n5					
	C16:0	-8.62%	-1.04%	-4.07%	-9.27%	
	C16:1n7	-7.04%	-0.41%	1.92%	-0.16%	
	C18:0	-1.66%	-1.27%	-0.19%	-2.03%	
	C18:1n7	-16.0%	-19.5%	-23.0%	-2.12%	
	C18:1n9	-7.01%	0.97%	-4.75%	-7.30%	
	C18:2n6	-8.91%	0.56%	-1.37%	-5.87%	
	C18:3n3	-14.4%	-12.2%	-16.2%	-18.3%	
	C18:3n6	-4.53%	-4.31%	-8.39%	-12.6%	
	C20:0	9.34%	10.2%	10.7%	16.2%	
	C20:1n9	10.8%	28.1%	19.1%	22.3%	
	C20:2n6	13.7%	5.84%	4.63%	0.00%	
	C20:3n6	0.00%	5.73%	7.58%	1.35%	
	C20:4n6	-16.1%	-6.32%	-11.8%	-13.8%	
	C20:5n3	-7.37%	-8.29%	-4.31%	-11.1%	
	C22:0	-62.2%	-56.0%	-53.2%	-55.1%	
	C22:1n9					
	C22:4n6	-7.09%	-1.79%	15.7%	6.98%	
	C22:5n3	-0.53%	1.02%	12.1%	0.89%	
	C22:5n6	-8.47%	-14.1%	-7.80%	-9.23%	
	C22:6n3	-1.97%	-4.60%	9.76%	4.14%	
	C24:0	-68.0%	-63.6%	-55.7%	-66.4%	
	C24:1n9	-68.2%	-58.7%	-62.2%	-66.5%	
Lab 4	C14:0	-19.6%	-17.5%	-17.8%	-11.6%	
	C14:1n5					
	C16:0	-2.67%	-2.78%	-0.33%	3.98%	
	C16:1n7	-2.85%	-7.95%	-1.00%	0.16%	
	C18:0	1.66%	-3.07%	-1.03%	6.24%	
	C18:1n7					
	C18:1n9	-4.18%	-4.82%	-8.47%	0.85%	
	C18:2n6	-19.4%	-17.0%	-19.2%	-12.6%	
	C18:3n3	-23.8%	-21.3%	-33.8%	-21.1%	
	C18:3n6	-6.90%	-12.9%	-17.5%	-10.7%	
	C20:0	-36.7%	-41.8%	-54.8%	-37.0%	
	C20:1n9	-27.5%	-23.9%	-17.5%	-18.5%	
	C20:2n6	13.0%	-24.7%	-15.6%	-1.56%	
	C20:3n6	-13.2%	-11.8%	-12.9%	-10.6%	
	C20:4n6	-21.7%	-16.2%	-23.9%	-14.1%	
	C20:5n3	-10.3%	8.54%	-1.81%	25.9%	
	C22:0	-49.2%	-46.4%	-36.5%	-17.7%	
	C22:1n9					
	C22:4n6	-16.8%	-16.4%	-23.2%	-13.9%	
	C22:5n3	-20.5%	-20.0%	-17.5%	-13.1%	
	C22:5n6	0.00%	-3.84%	-16.9%	1.03%	
	C22:6n3	-17.8%	-15.3%	-21.6%	-13.9%	
	C24:0	-75.8%	-58.0%	-56.1%	-60.0%	
	C24:1n9	-62.1%	-61.5%	-68.8%	-59.6%	

Table 8 (cont). Percent differences of the Laboratory Means (n=3) from Median of Interlaboratory Data (See Table 7)

Lab 6	C14:0	-1.73%	-6.67%	-4.86%	-7.67%	
	C14:1n5					
	C16:0	2.67%	4.32%	-1.19%	-3.78%	
	C16:1n7	4.51%	1.17%	2.86%	0.38%	
	C18:0	7.62%	3.44%	5.09%	2.03%	
	C18:1n7	1.68%	8.15%	-1.68%	-0.30%	
	C18:1n9	5.59%	3.64%	-0.29%	-0.85%	
	C18:2n6	-0.25%	-0.01%	0.48%	-2.83%	
	C18:3n3	-0.32%	-1.84%	-6.20%	-2.67%	
	C18:3n6	0.58%	-0.37%	-1.10%	-1.36%	
	C20:0					
	C20:1n9					
	C20:2n6					
	C20:3n6	3.18%	-0.14%	0.00%	0.00%	
	C20:4n6	-0.69%	3.28%	2.00%	-3.32%	
	C20:5n3	-2.27%	-2.44%	0.55%	-0.28%	
	C22:0	5.44%	10.2%	6.60%	1.65%	
	C22:1n9					
	C22:4n6	0.00%	0.00%	0.00%	0.00%	
	C22:5n3	1.20%	-1.02%	1.21%	-0.19%	
	C22:5n6					
	C22:6n3	-3.47%	-8.64%	-0.62%	-8.11%	
	C24:0	8.52%	15.4%	6.41%	-1.36%	
	C24:1n9	9.05%	16.4%	4.09%	1.01%	
Lab 7	C14:0	48.5%	0.10%	42.5%	44.8%	
	C14:1n5	104%	23.8%	93.2%	92.6%	
	C16:0	34.0%	-2.08%	27.3%	25.6%	
	C16:1n7	-72.6%	-75.7%	-66.8%	-77.3%	
	C18:0	54.1%	13.9%	43.7%	40.0%	
	C18:1n7	6.73%	-12.5%	1.68%	41.4%	
	C18:1n9	46.0%	-4.35%	34.7%	35.7%	
	C18:2n6	24.5%	-27.0%	19.4%	26.7%	
	C18:3n3	41.2%	-2.77%	37.4%	39.3%	
	C18:3n6	41.9%	-26.9%	30.3%	37.1%	
	C20:0	12.0%	-4.23%	17.3%	103%	
	C20:1n9	196%	131%	67.3%	117%	
	C20:2n6	-51.2%	-74.1%	-66.4%	-59.2%	
	C20:3n6	56.7%	10.4%	50.9%	46.7%	
	C20:4n6	44.1%	-2.04%	33.3%	40.0%	
	C20:5n3	39.9%	-3.14%	39.2%	46.6%	
	C22:0	-88.1%	-96.3%	-92.0%	-92.0%	
	C22:1n9					
	C22:4n6	73.4%	28.2%	72.8%	71.2%	
	C22:5n3	52.7%	9.66%	54.9%	54.9%	
	C22:5n6	60.5%	19.2%	52.7%	50.5%	
	C22:6n3	53.5%	13.8%	59.0%	62.7%	
	C24:0	-90.3%	-94.8%	-89.0%	-92.4%	
	C24:1n9					

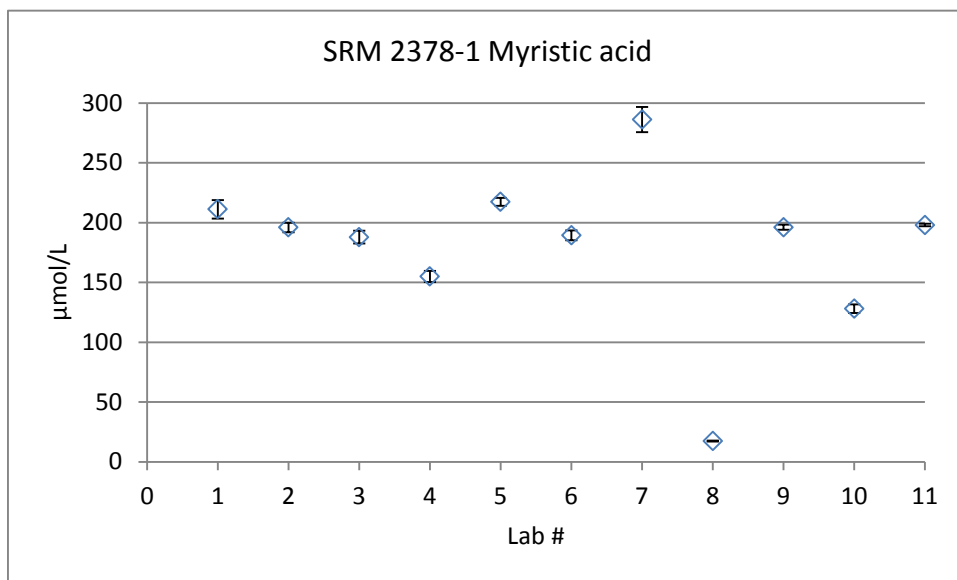
Table 8 (cont). Percent differences of the Laboratory Means (n=3) from Median of Interlaboratory Data (See Table 7)

Lab 9	C14:0	1.76%	-1.41%	-0.02%	-1.86%	
	C14:1n5	10.7%	0.00%	-2.09%	14.8%	
	C16:0	4.12%	5.42%	0.33%	-1.95%	
	C16:1n7	3.61%	-1.73%	-0.40%	9.12%	
	C18:0	12.4%	6.11%	4.49%	8.45%	
	C18:1n7					
	C18:1n9	17.8%	13.2%	7.19%	16.2%	
	C18:2n6	0.25%	0.01%	-2.90%	-1.64%	
	C18:3n3	5.47%	1.84%	1.71%	2.67%	
	C18:3n6	7.43%	2.02%	1.73%	1.36%	
	C20:0	10.4%	30.3%	0.00%	40.3%	
	C20:1n9	-1.76%	-11.0%	-24.2%	2.17%	
	C20:2n6	12.5%	7.33%	9.44%	4.65%	
	C20:3n6	5.93%	0.00%	-0.22%	-1.75%	
	C20:4n6	1.22%	2.04%	-7.14%	-4.31%	
	C20:5n3	2.27%	-3.99%	-4.46%	-3.63%	
	C22:0	9.37%	5.53%	5.93%	6.78%	
	C22:1n9	229%	124%	174%	240%	
	C22:4n6	141%	96.2%	91.3%	61.8%	
	C22:5n3	1.08%	-4.82%	-5.32%	-0.17%	
	C22:5n6	13.9%	-4.99%	0.09%	-4.61%	
	C22:6n3	1.97%	-6.64%	-0.66%	-4.14%	
	C24:0	9.31%	7.47%	11.1%	1.36%	
	C24:1n9	0.00%	0.00%	0.00%	-6.23%	
Lab 10	C14:0	-33.6%	-43.2%	-43.8%	-44.9%	
	C14:1n5	-47.8%	-54.8%	-55.2%	-49.6%	
	C16:0	-21.0%	-27.6%	-31.3%	-32.5%	
	C16:1n7	-25.3%	-30.6%	-31.7%	-32.1%	
	C18:0	-7.04%	-20.4%	-21.0%	-20.9%	
	C18:1n7	-1.68%	-3.71%	-10.9%	0.30%	
	C18:1n9	-16.1%	-23.3%	-28.3%	-26.4%	
	C18:2n6	-22.5%	-26.5%	-29.9%	-30.2%	
	C18:3n3	-22.5%	-28.5%	-33.0%	-33.1%	
	C18:3n6	-23.9%	-27.0%	-33.2%	-31.3%	
	C20:0	3.85%	0.00%	-30.7%	-11.4%	
	C20:1n9	-0.31%	-24.3%	-24.7%	-17.2%	
	C20:2n6	-19.4%	-16.2%	-18.6%	-16.6%	
	C20:3n6	-6.25%	-17.8%	-18.3%	-20.0%	
	C20:4n6	-15.3%	-18.9%	-27.4%	-25.8%	
	C20:5n3	-13.4%	-10.8%	-18.8%	-14.9%	
	C22:0	58.9%	40.1%	35.5%	32.9%	
	C22:1n9	-43.7%	-69.7%	-71.2%	-65.2%	
	C22:4n6	5.90%	-5.49%	-5.69%	-6.80%	
	C22:5n3	0.53%	-9.11%	-10.4%	-9.83%	
	C22:5n6	0.00%	3.84%	-0.09%	-1.03%	
	C22:6n3	-5.75%	-20.8%	-15.2%	-21.0%	
	C24:0	79.9%	62.1%	52.2%	45.5%	
	C24:1n9	80.7%	59.4%	52.1%	51.1%	

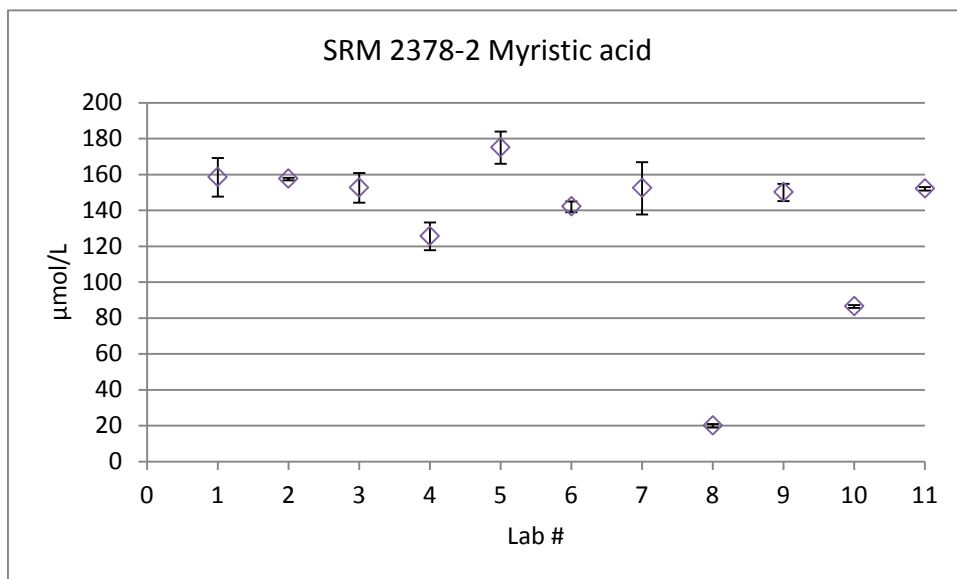
Table 8 (cont). Percent differences of the Laboratory Means (n=3) from Median of Interlaboratory Data (See Table 7)

Lab 11	C14:0	2.77%	-0.10%	0.02%	0.39%	
	C14:1n5	-12.0%	-23.9%	-18.0%	-12.8%	
	C16:0	7.37%	10.9%	3.55%	5.57%	
	C16:1n7	2.85%	0.53%	0.40%	2.22%	
	C18:0	-4.67%	-7.65%	-11.6%	-8.49%	
	C18:1n7	-3.29%	3.71%	-8.35%	-2.05%	
	C18:1n9	8.70%	6.89%	0.29%	2.89%	
	C18:2n6	0.80%	2.88%	0.02%	2.85%	
	C18:3n3	7.69%	7.25%	1.57%	5.18%	
	C18:3n6	-0.58%	2.36%	0.97%	1.94%	
	C20:0	0.00%	12.7%	-23.2%	-0.23%	
	C20:1n9	0.31%	-0.56%	-3.67%	-2.17%	
	C20:2n6	0.00%	0.00%	0.00%	1.80%	
	C20:3n6	0.87%	3.38%	3.60%	5.04%	
	C20:4n6	0.69%	7.47%	-2.00%	3.32%	
	C20:5n3	3.43%	2.44%	-0.55%	0.28%	
	C22:0	39.1%	46.7%	38.4%	41.1%	
	C22:1n9	-26.9%	-38.7%	-30.8%	-22.0%	
	C22:4n6	0.00%	8.00%	9.02%	16.9%	
	C22:5n3	7.83%	6.76%	11.4%	9.88%	
	C22:5n6	4.62%	15.0%	15.5%	18.0%	
	C22:6n3	9.15%	4.60%	12.2%	8.42%	
	C24:0	44.5%	54.4%	43.4%	39.9%	
	C24:1n9	52.1%	63.2%	51.5%	49.7%	

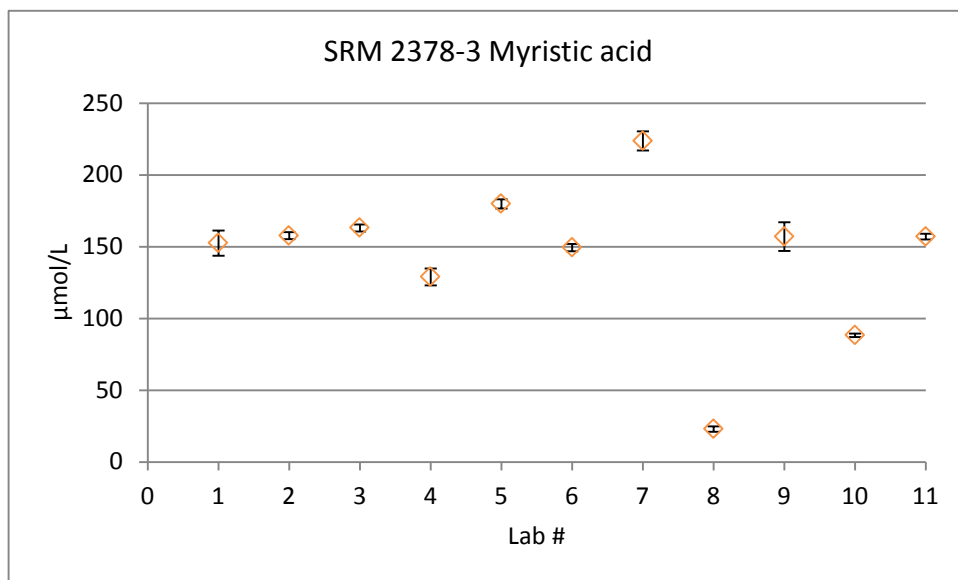
Appendix A. CHARTS by FATTY ACID and MATERIAL



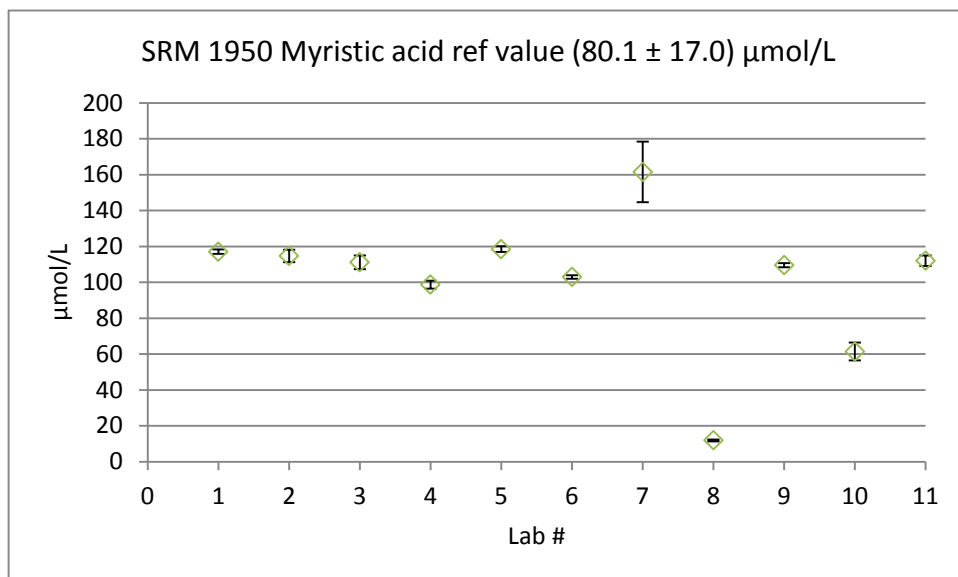
Median (excluding lab 8)
193 $\mu\text{mol/L}$



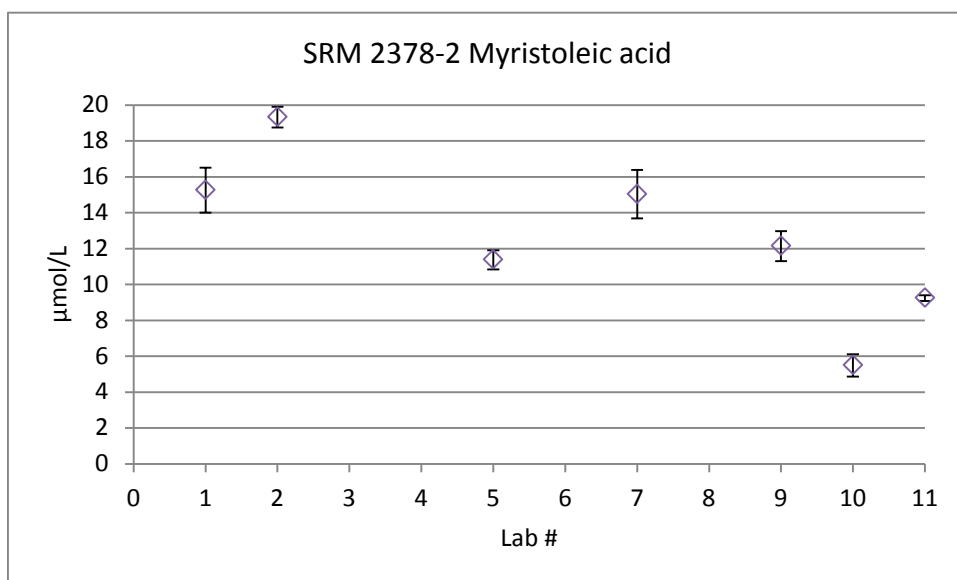
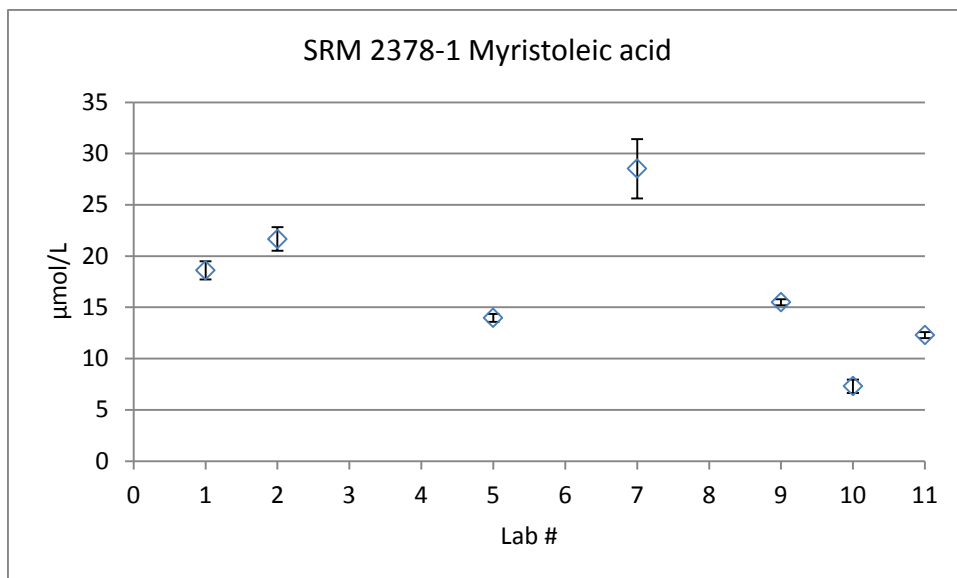
Median (excluding lab 8)
152 $\mu\text{mol/L}$

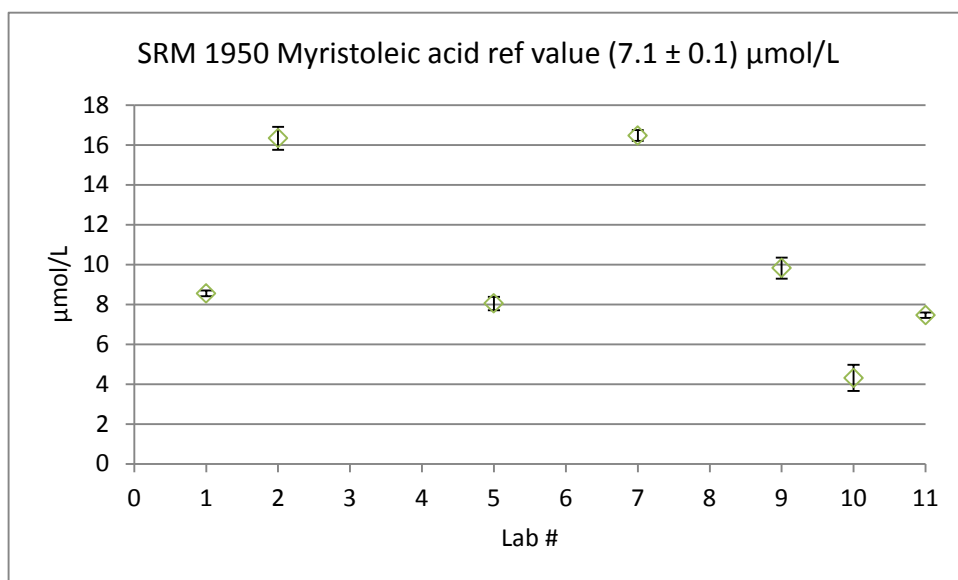
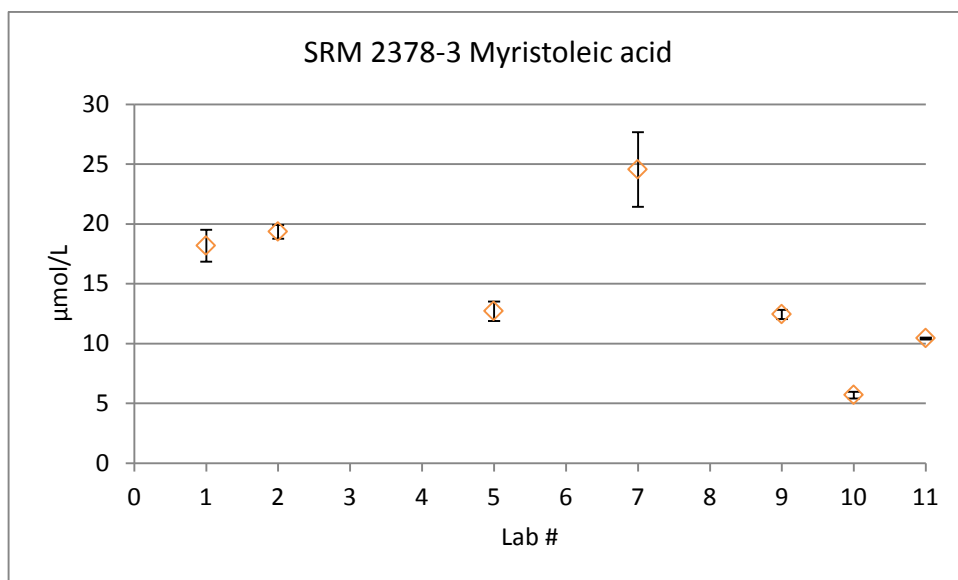


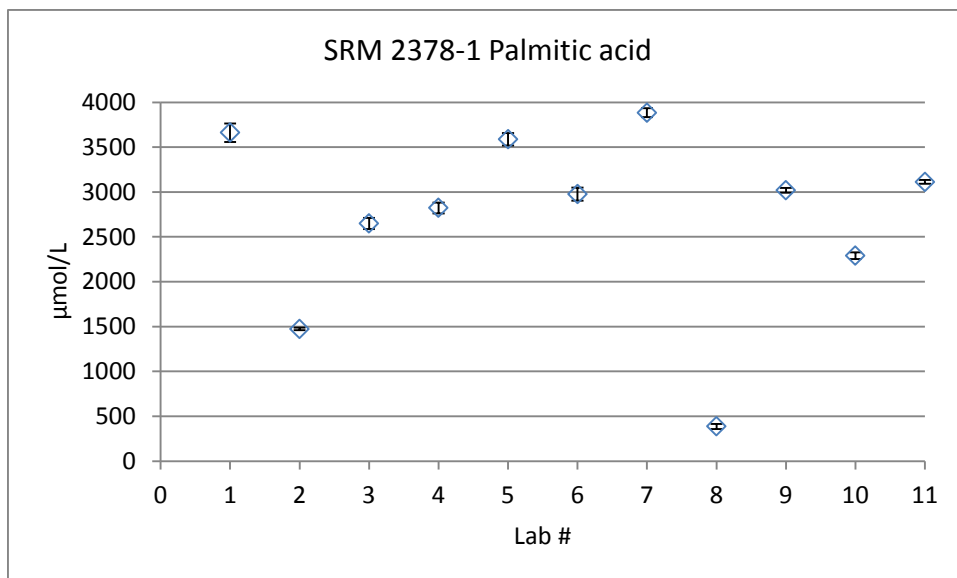
Median (excluding lab 8)
157 µmol/L



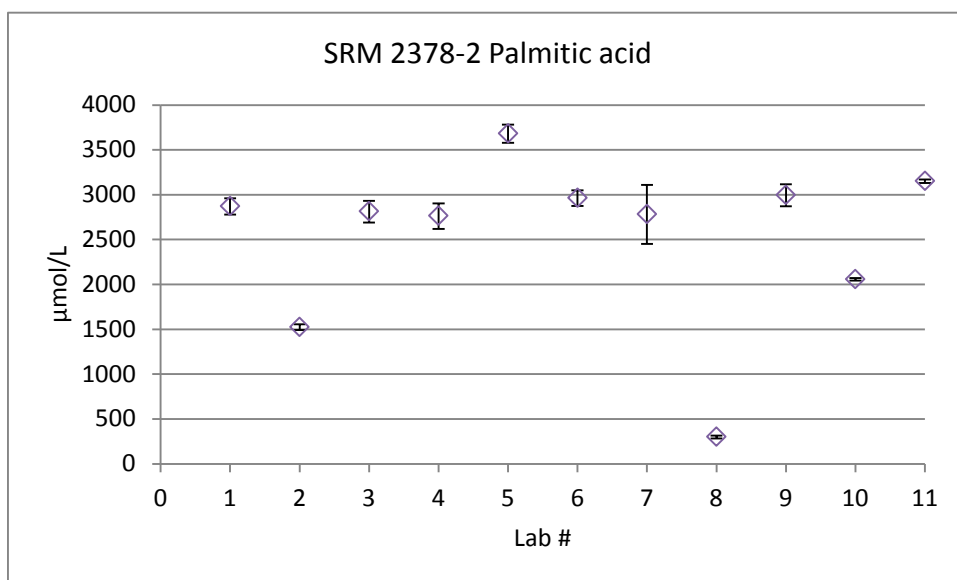
Median (excluding lab 8)
112 µmol/L



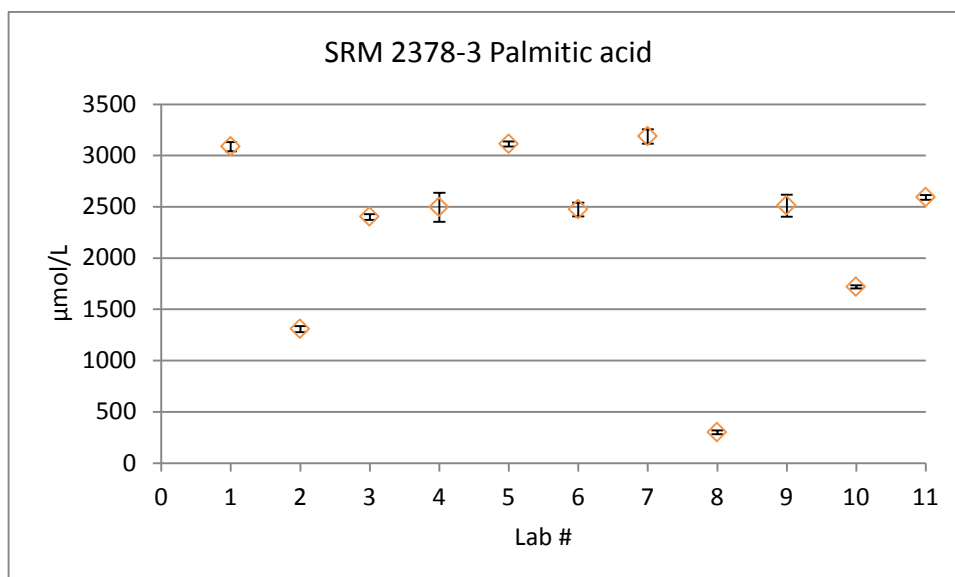




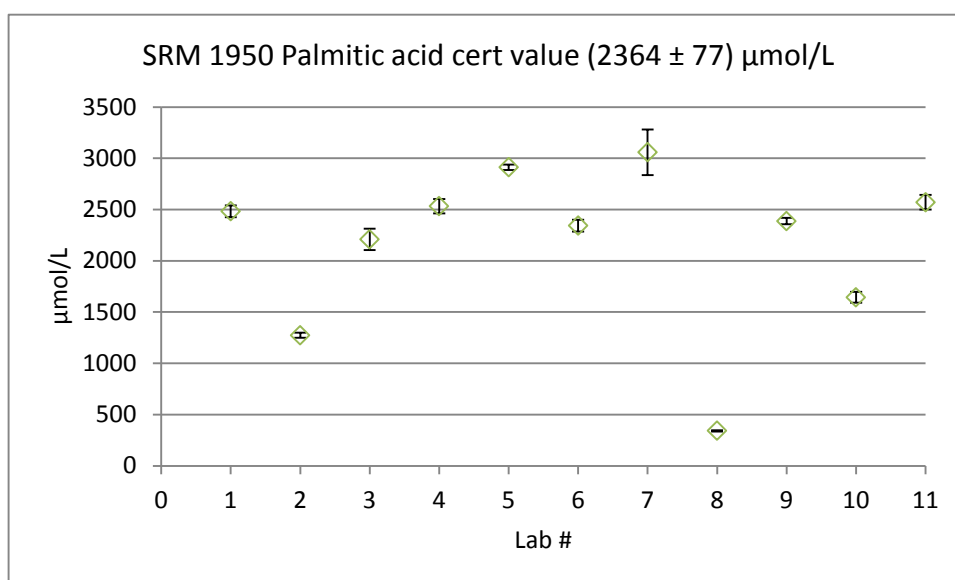
Median (excluding lab 8)
2900 µmol/L



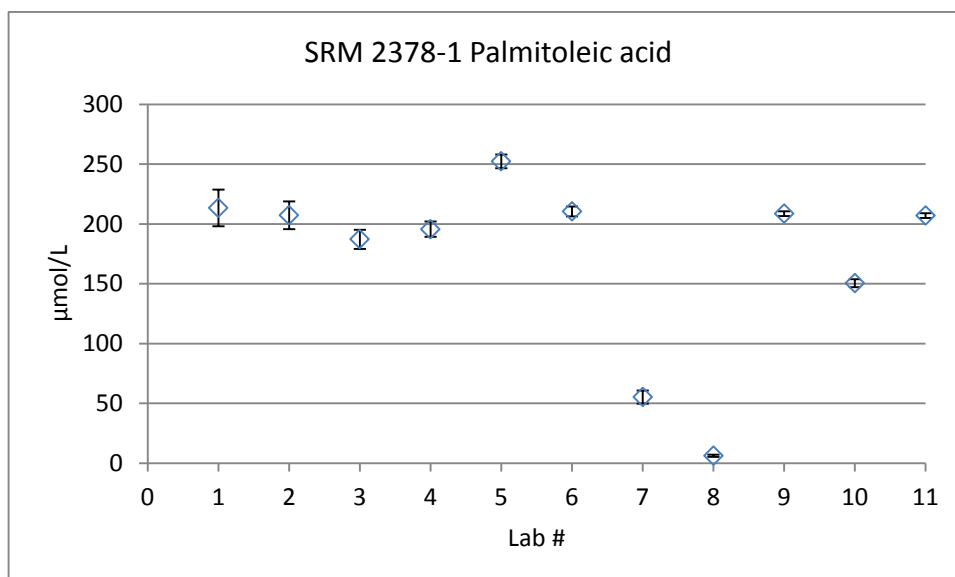
Median (excluding lab 8)
2840 µmol/L



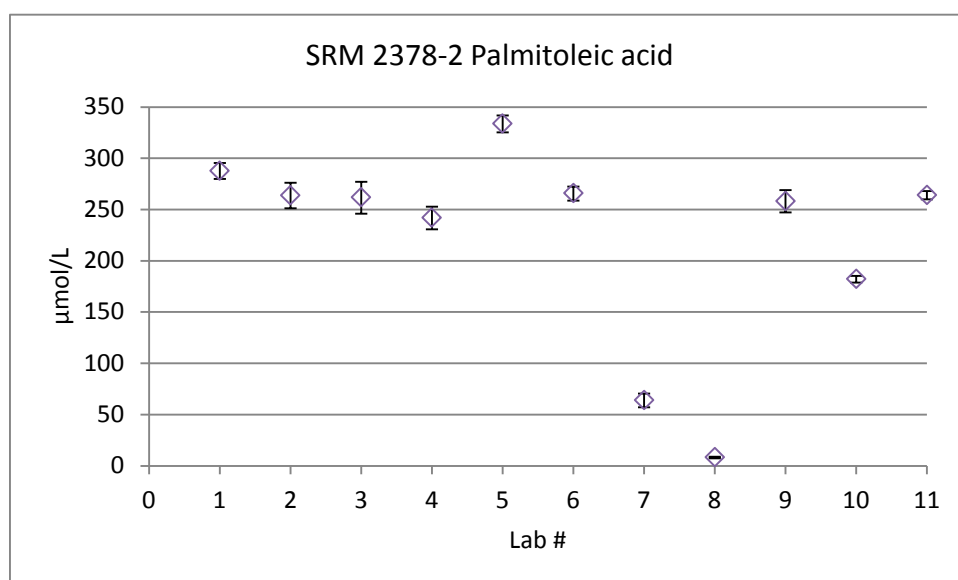
Median (excluding lab 8)
2500 µmol/L



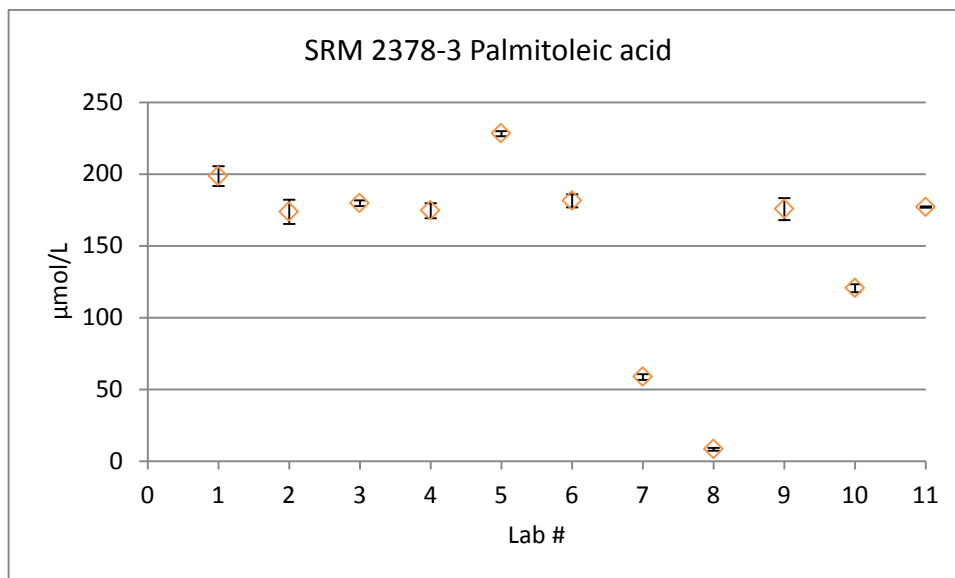
Median (excluding lab 8)
2440 µmol/L



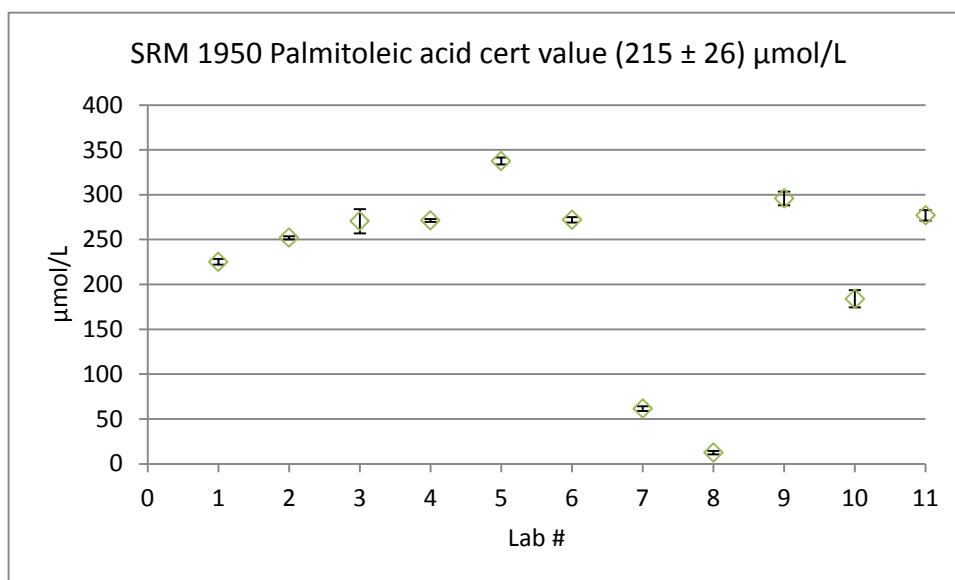
Median (excluding lab 8)
201 µmol/L



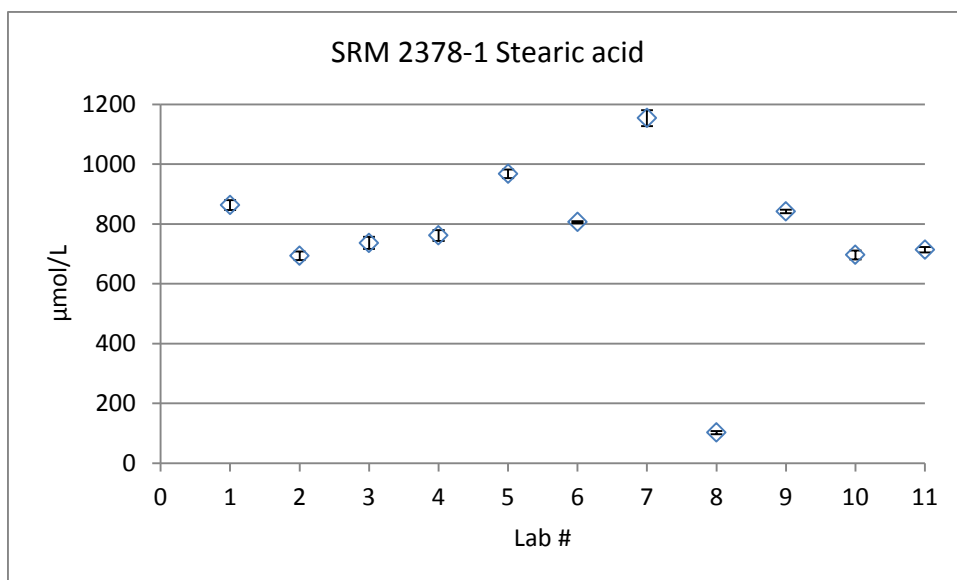
Median (excluding lab 8)
263 µmol/L



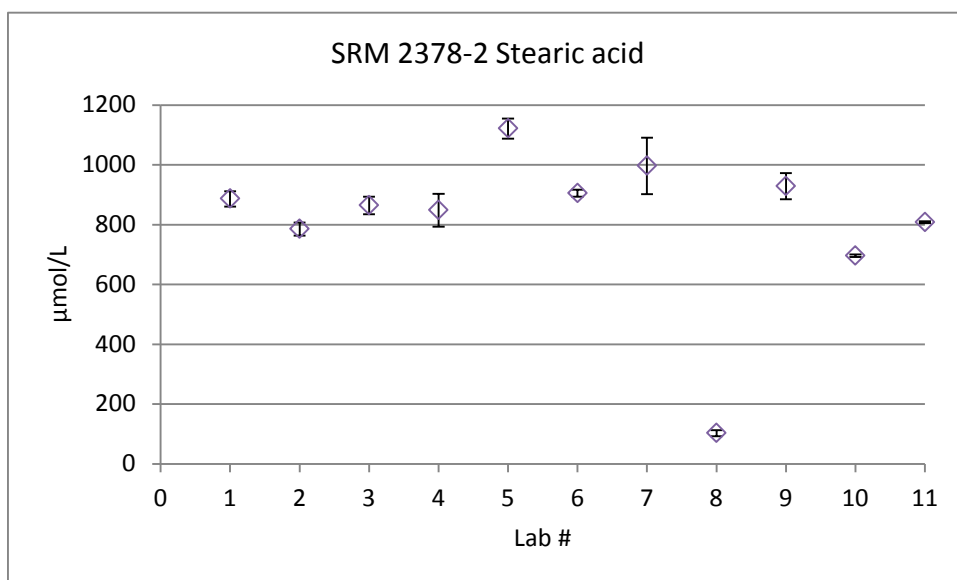
Median (excluding lab 8)
176 µmol/L



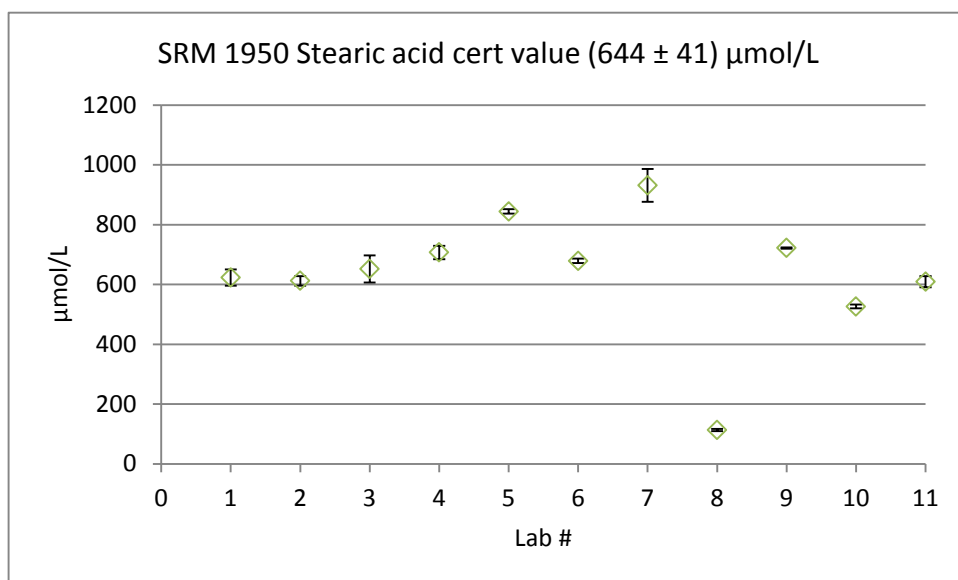
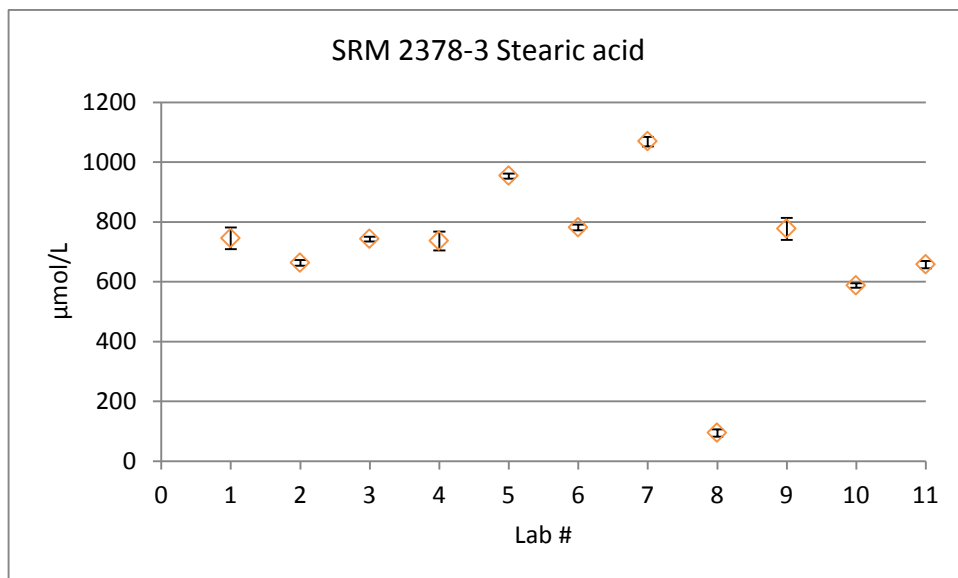
Median (excluding lab 8)
271 µmol/L

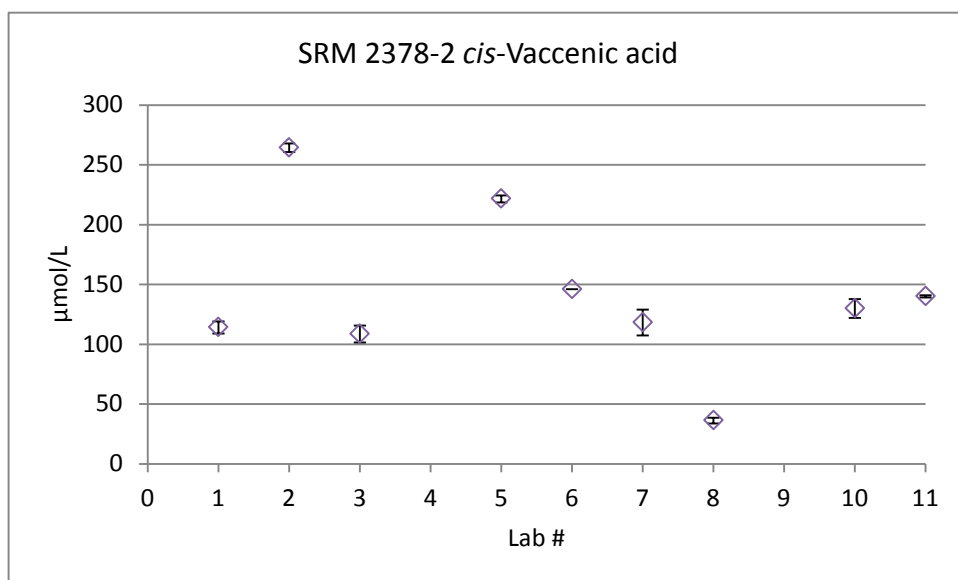
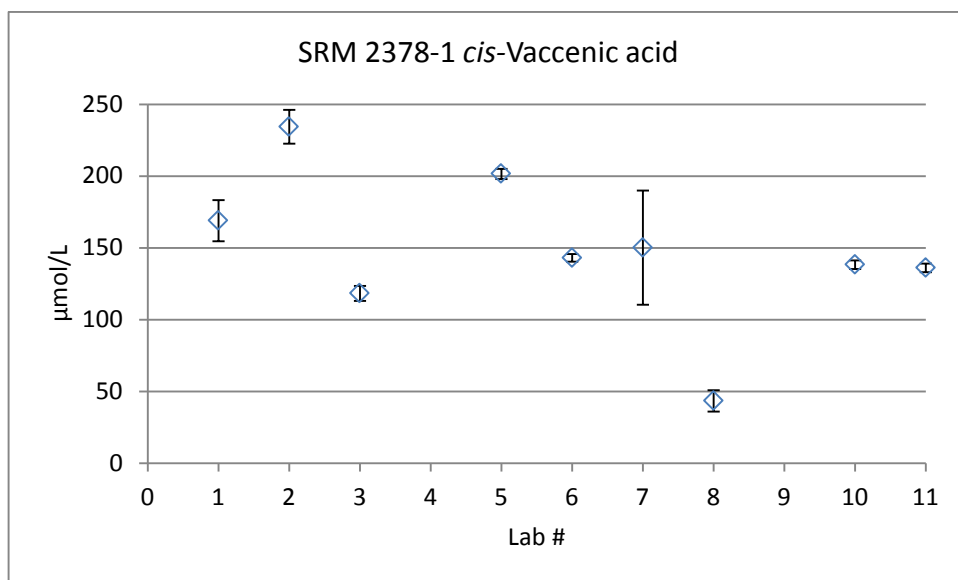


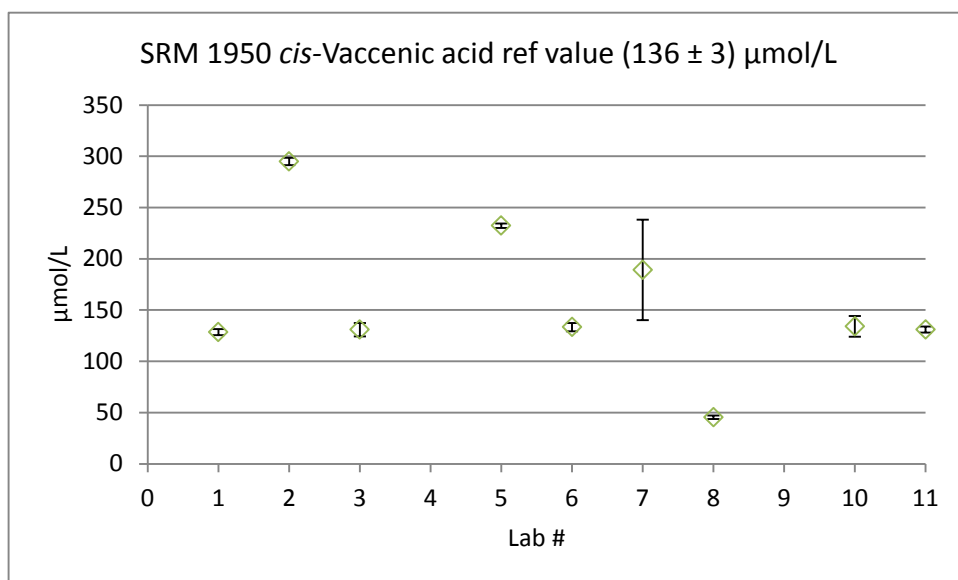
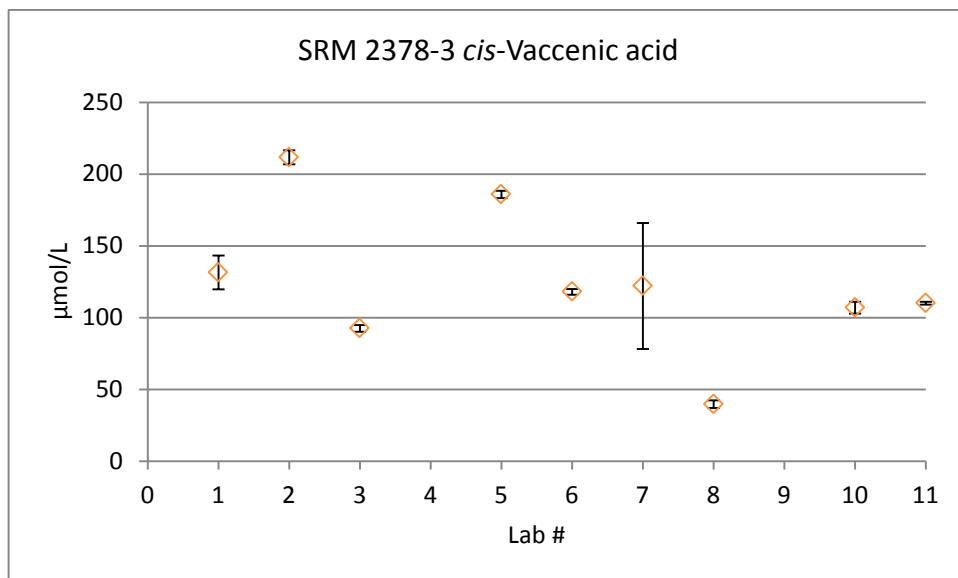
Median (excluding lab 8)
749 $\mu\text{mol/L}$

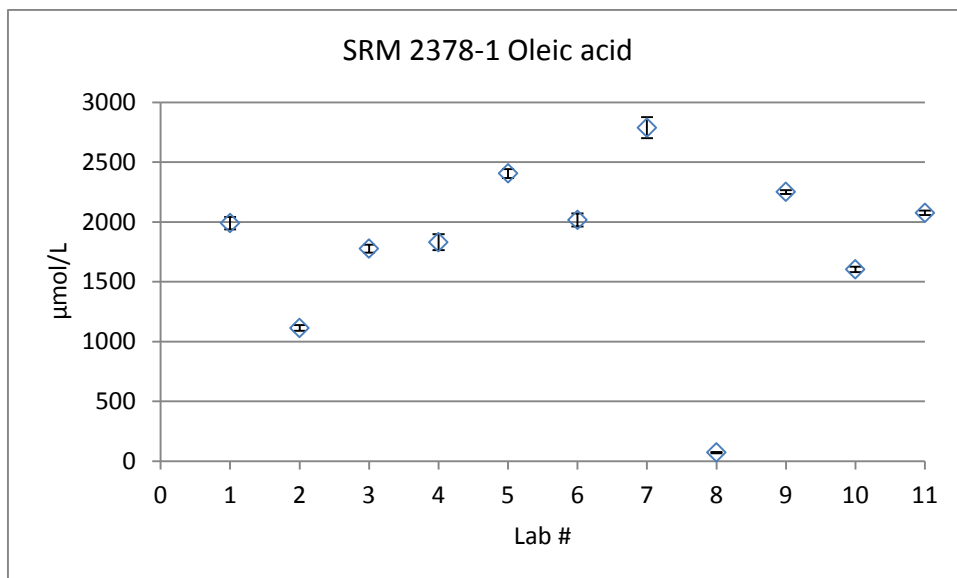


Median (excluding lab 8)
875 $\mu\text{mol/L}$

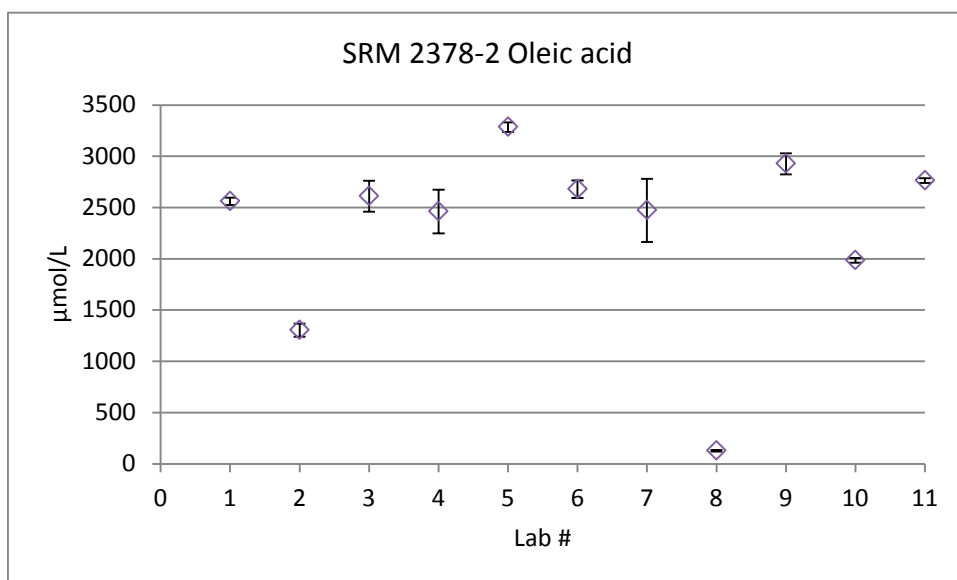




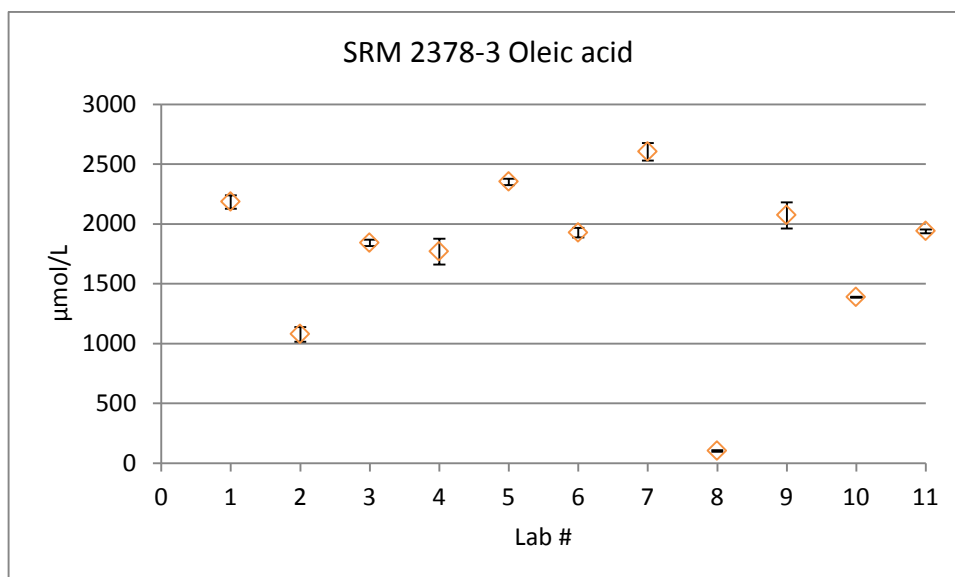




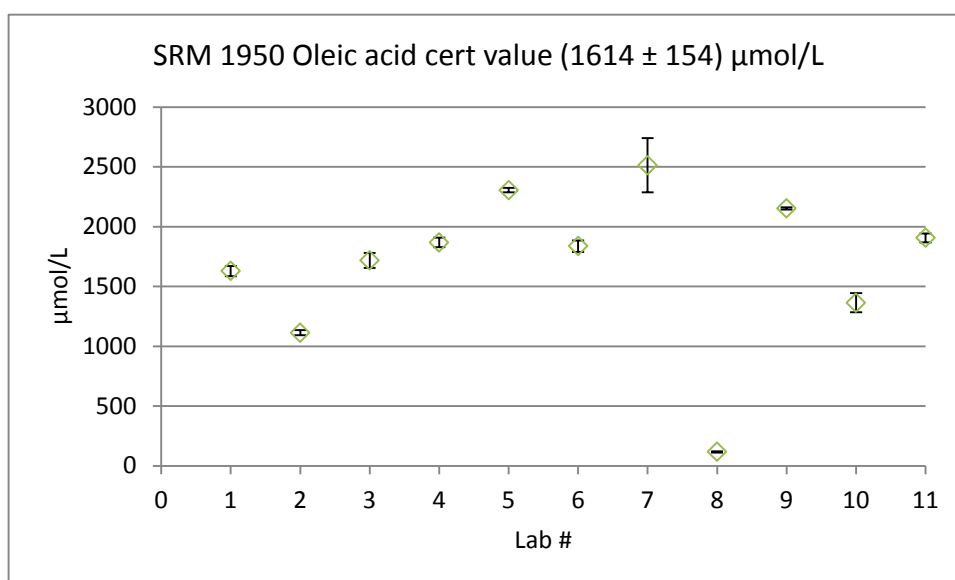
Median (excluding lab 8)
1910 $\mu\text{mol/L}$



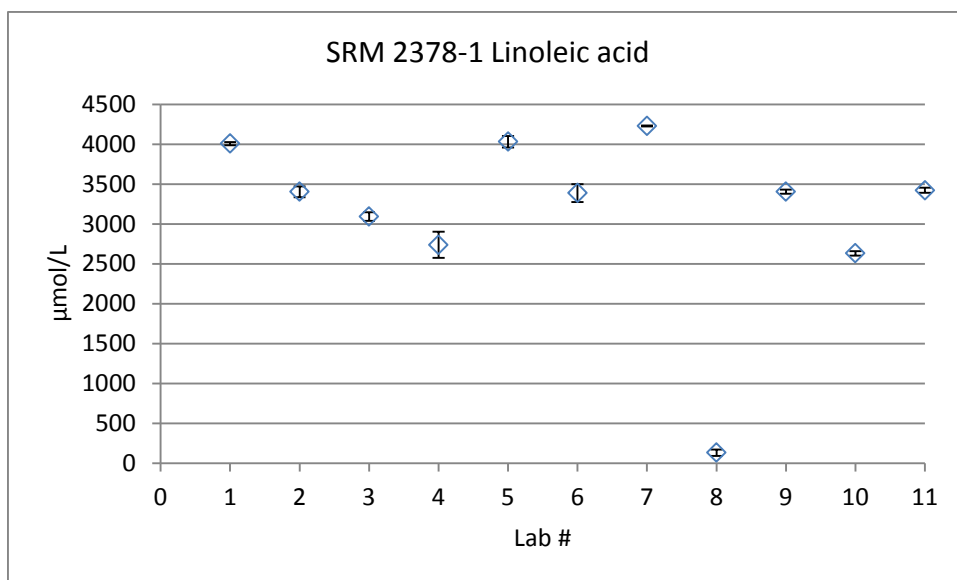
Median (excluding lab 8)
2590 $\mu\text{mol/L}$



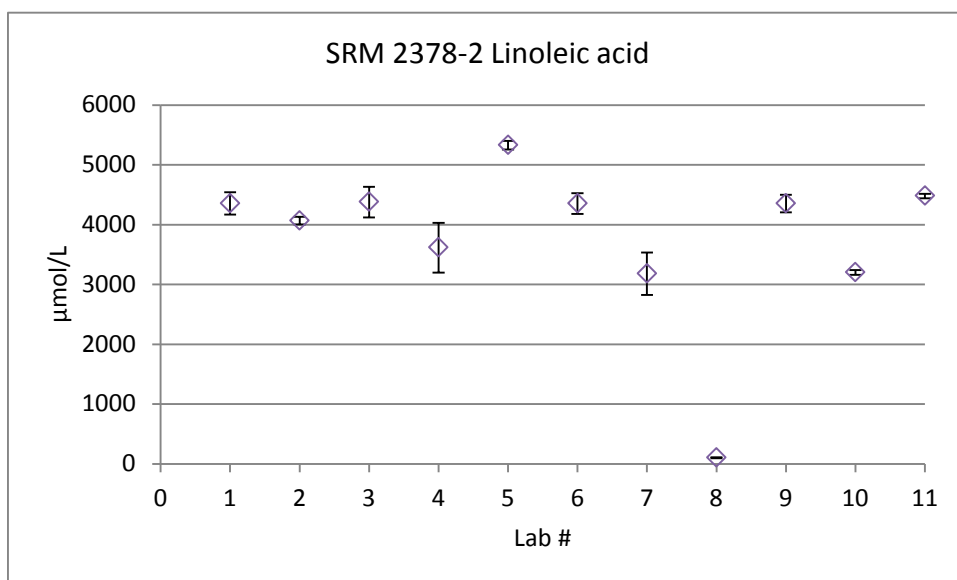
Median (excluding lab 8)
1930 µmol/L



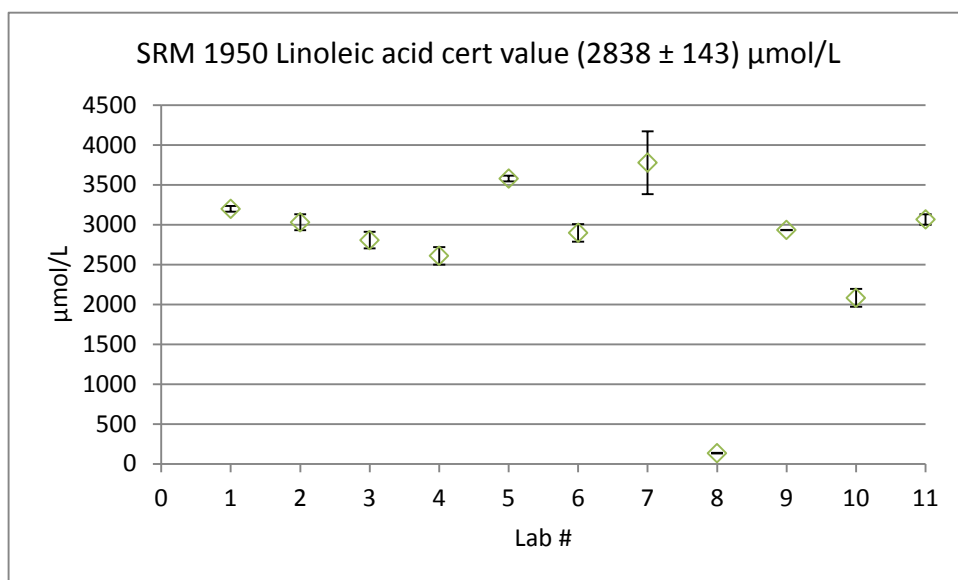
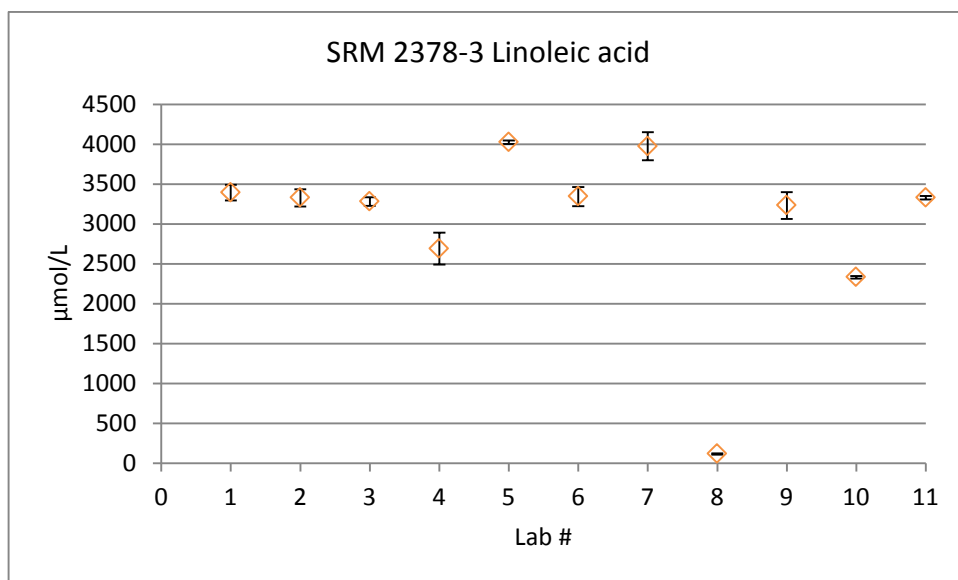
Median (excluding lab 8)
1850 µmol/L

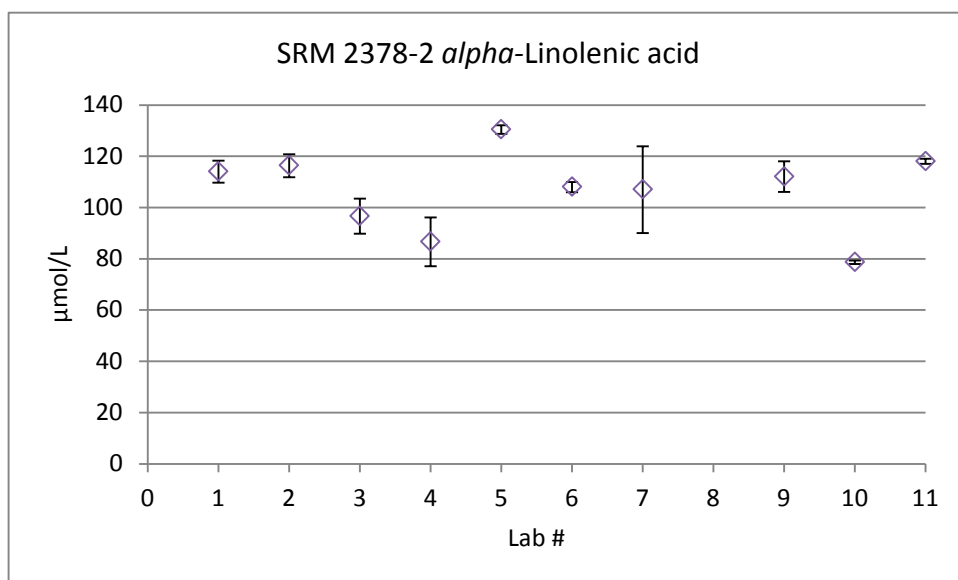
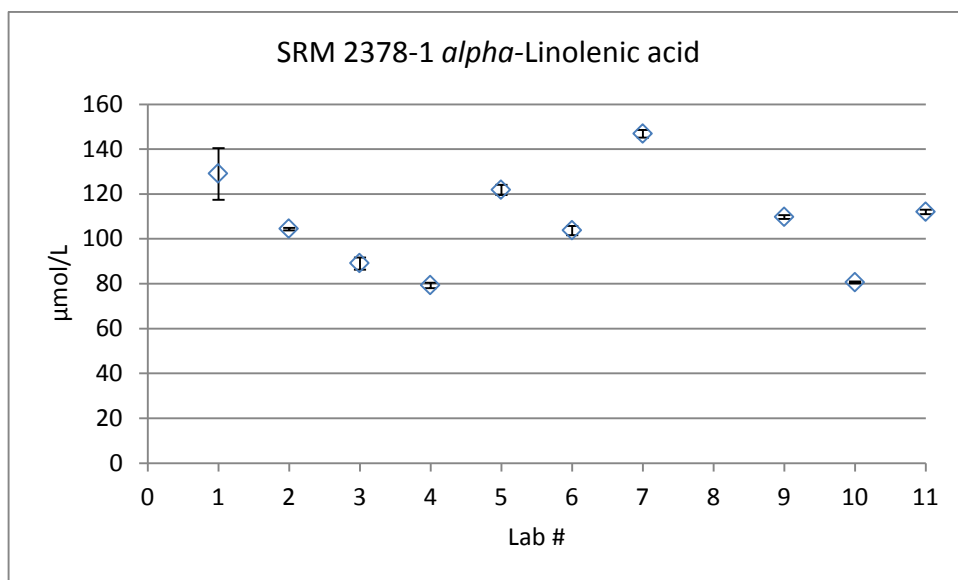


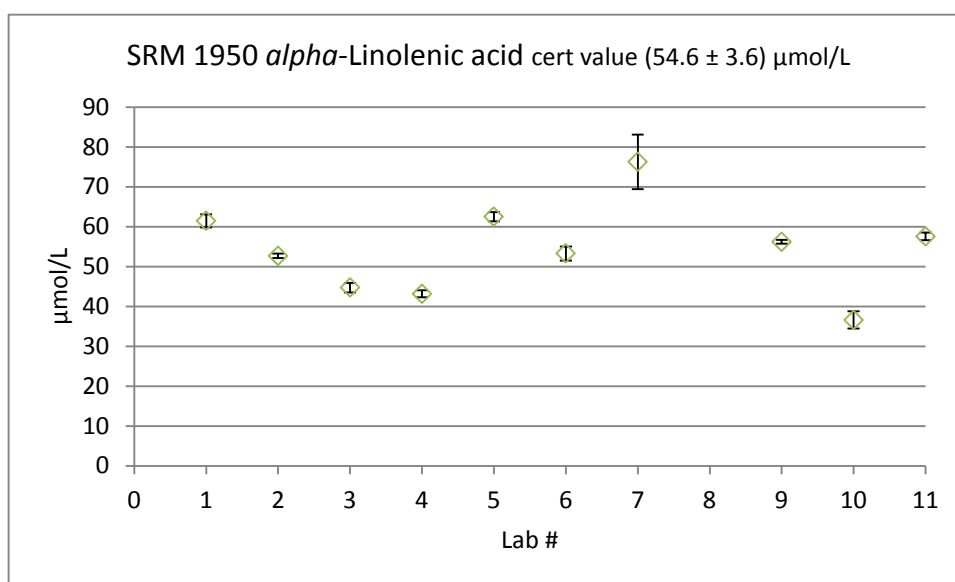
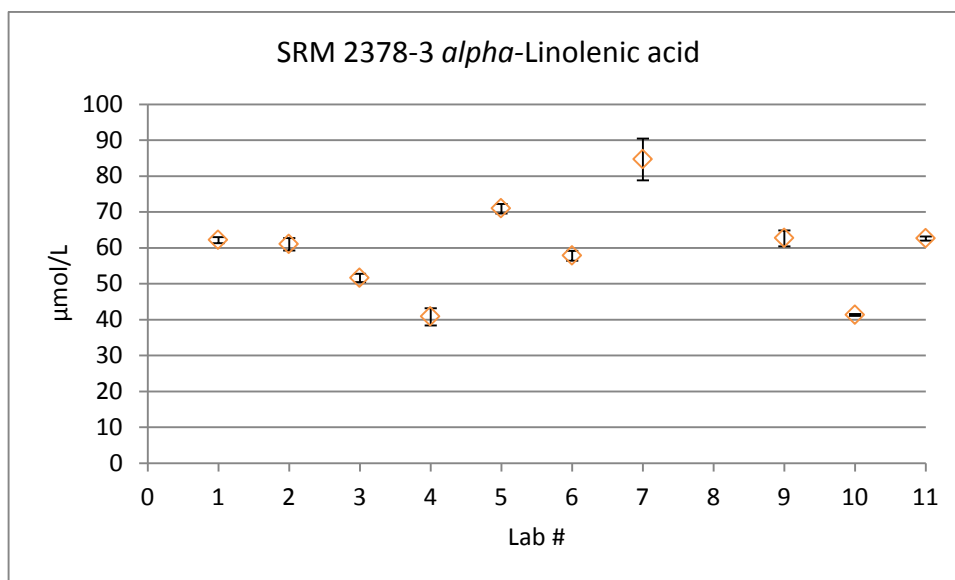
Median (excluding lab 8)
3400 $\mu\text{mol/L}$

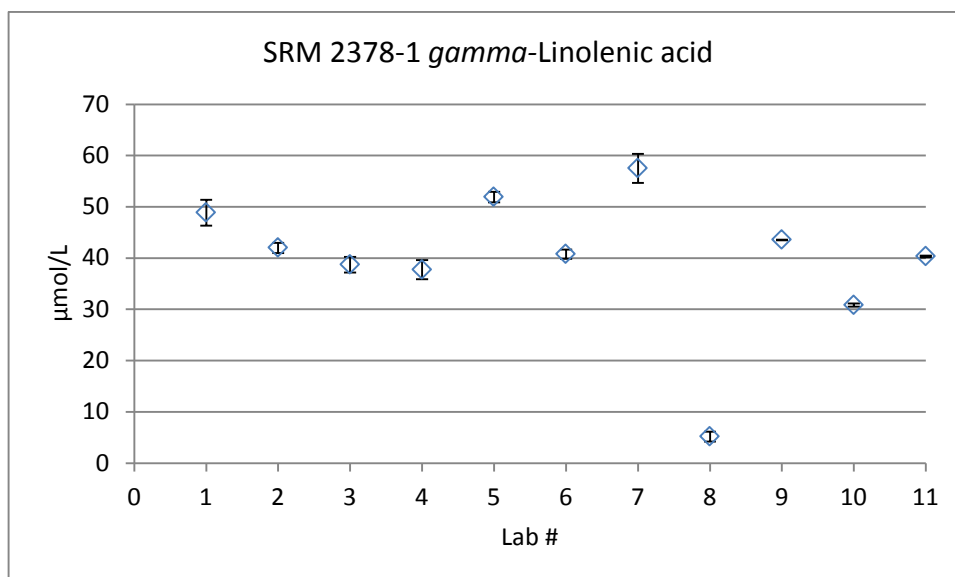


Median (excluding lab 8)
4350 $\mu\text{mol/L}$

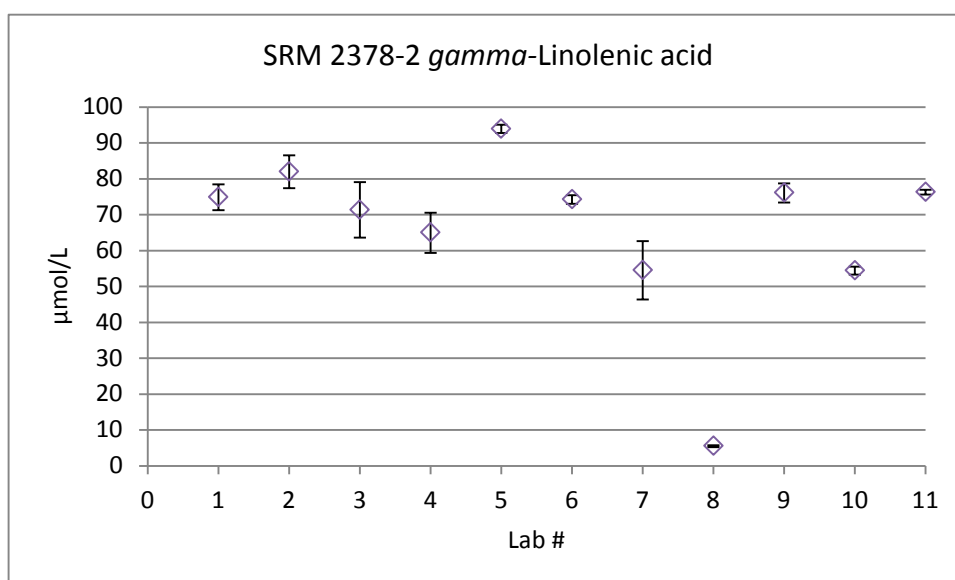




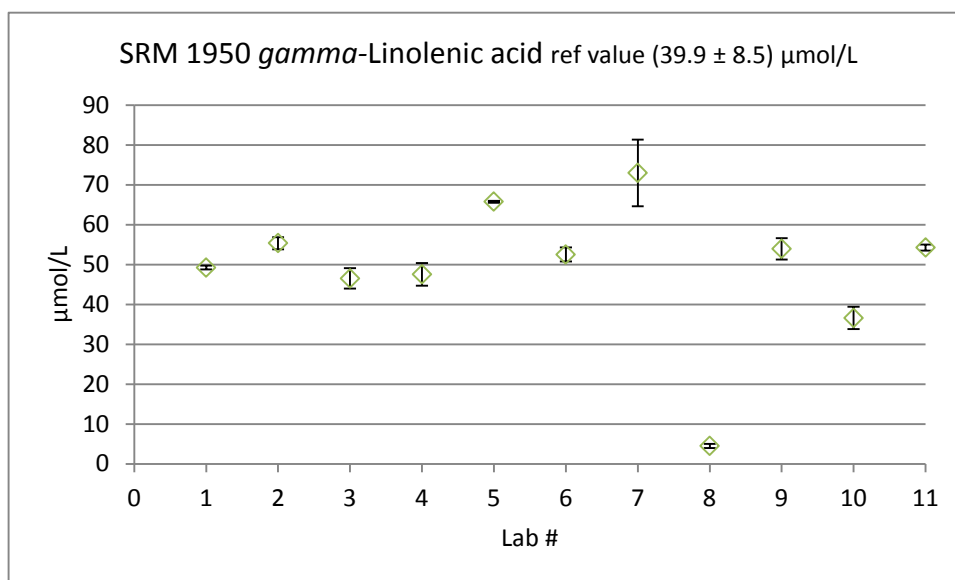
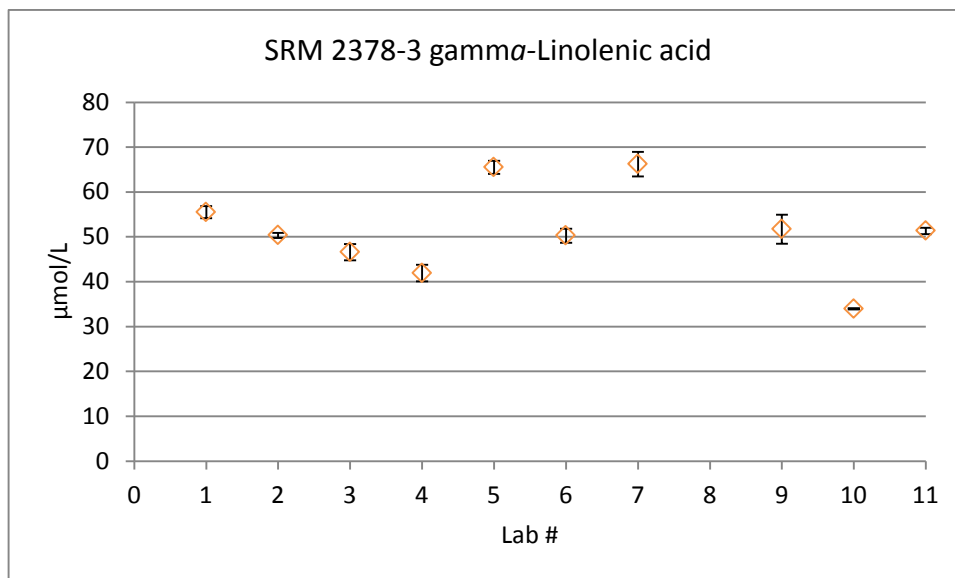


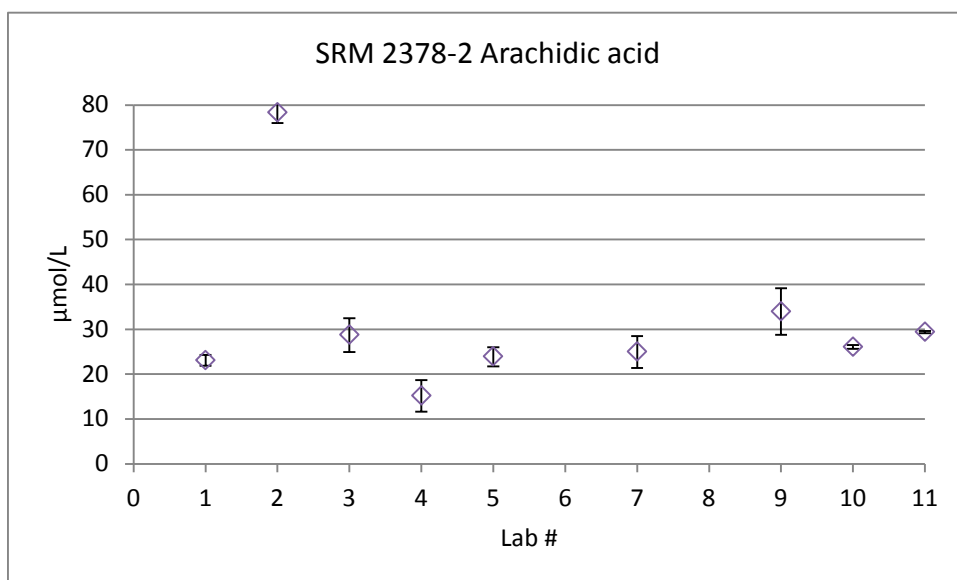
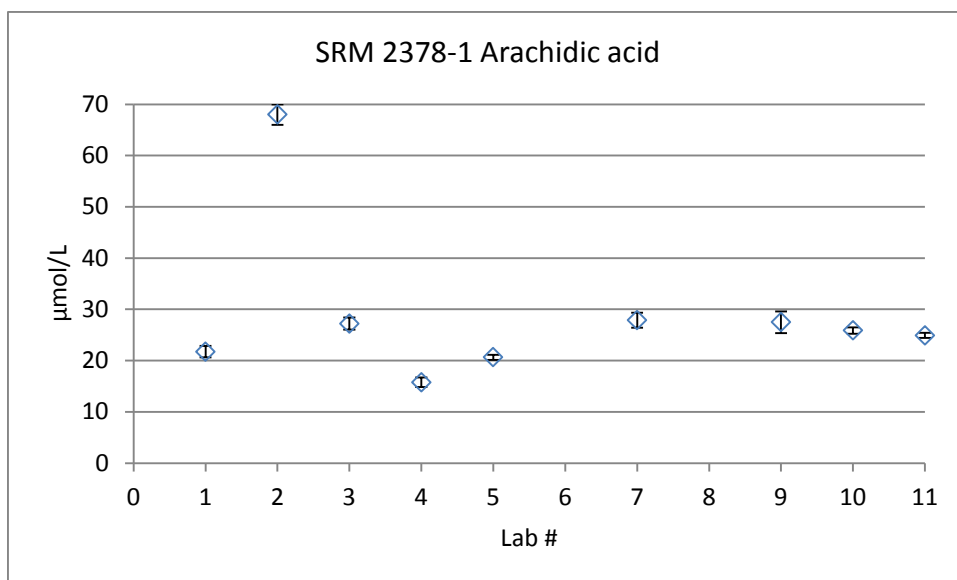


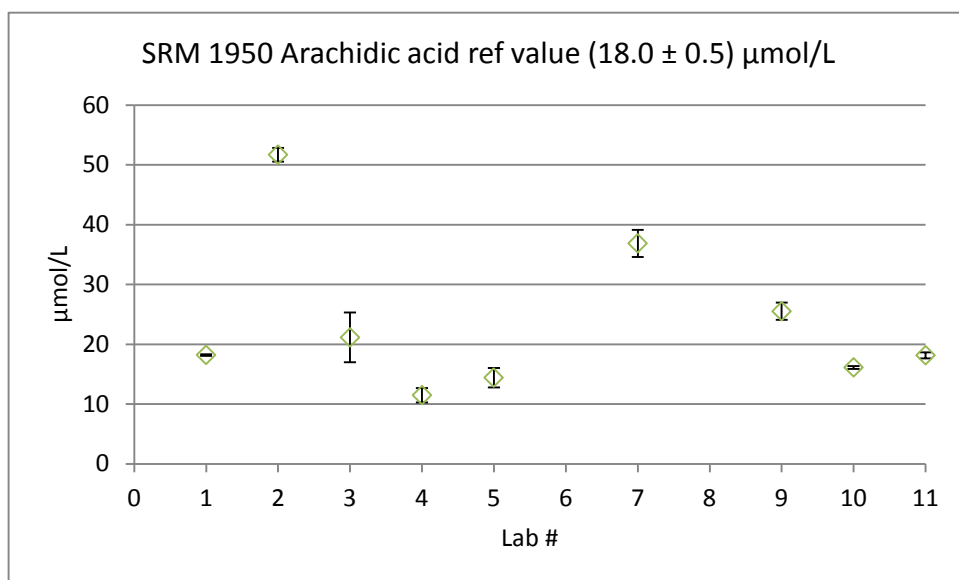
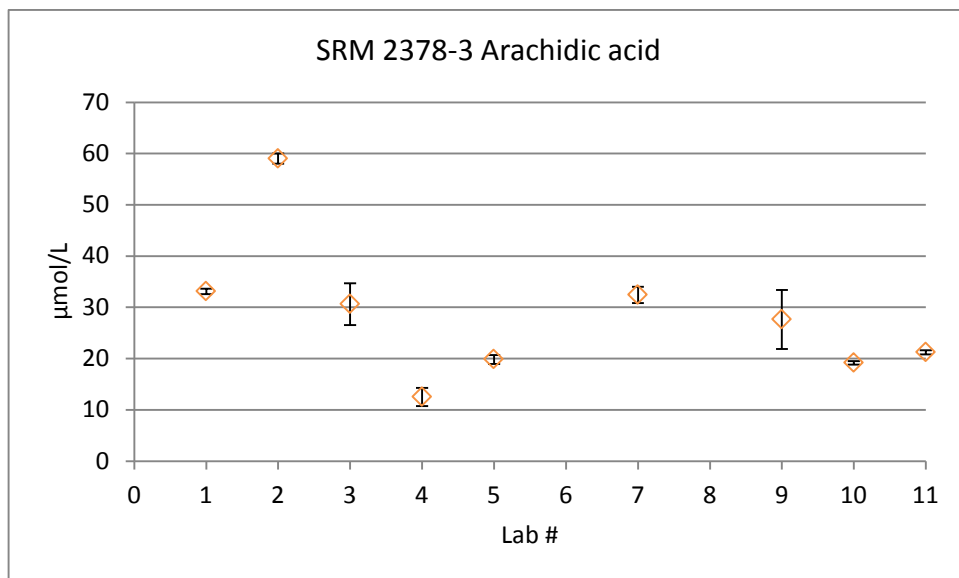
Median (excluding lab 8)
40.5 $\mu\text{mol/L}$

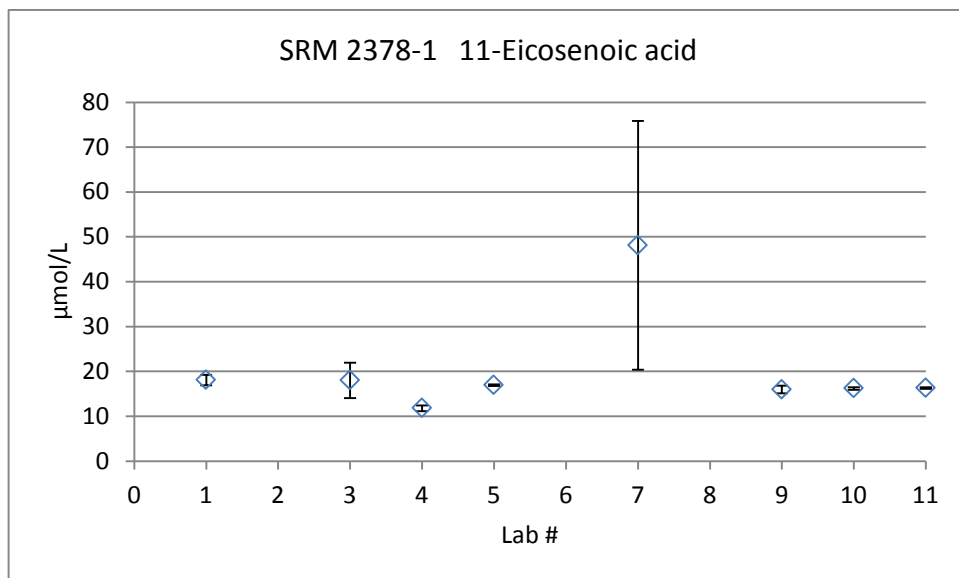


Median (excluding lab 8)
74.5 $\mu\text{mol/L}$

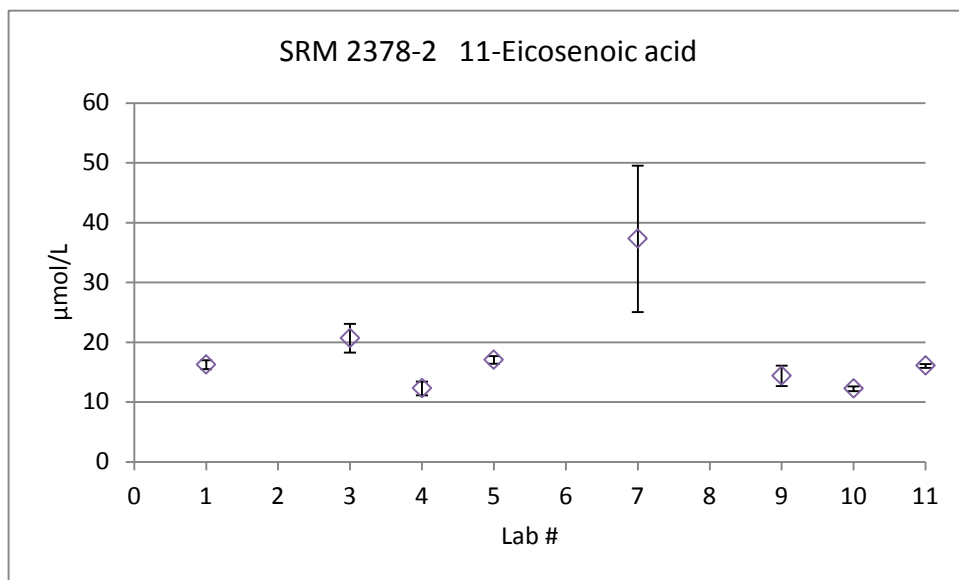




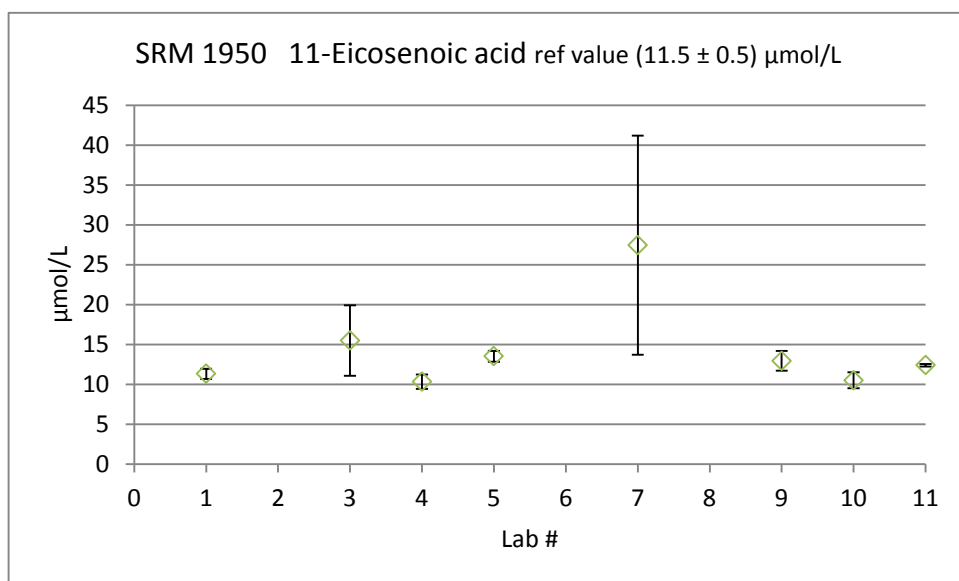
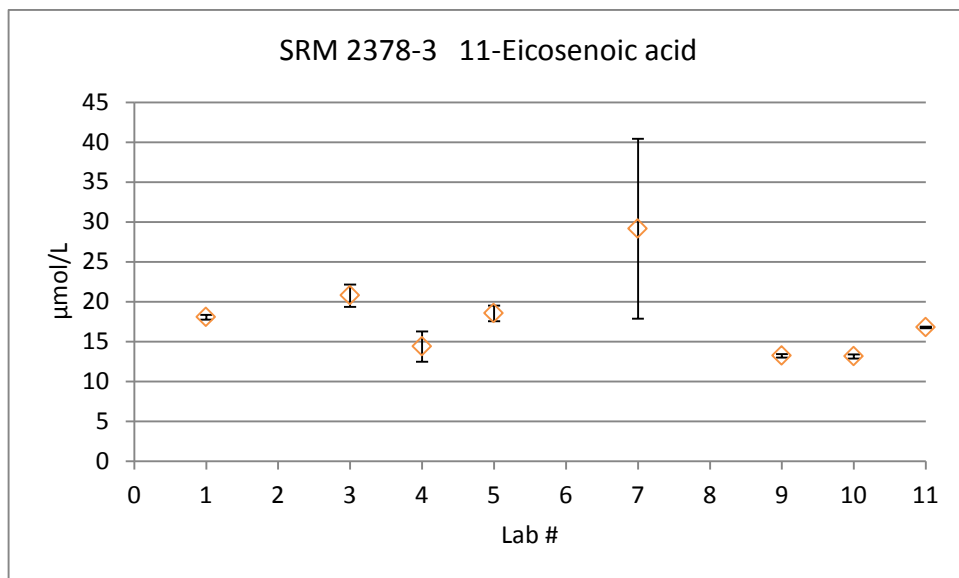


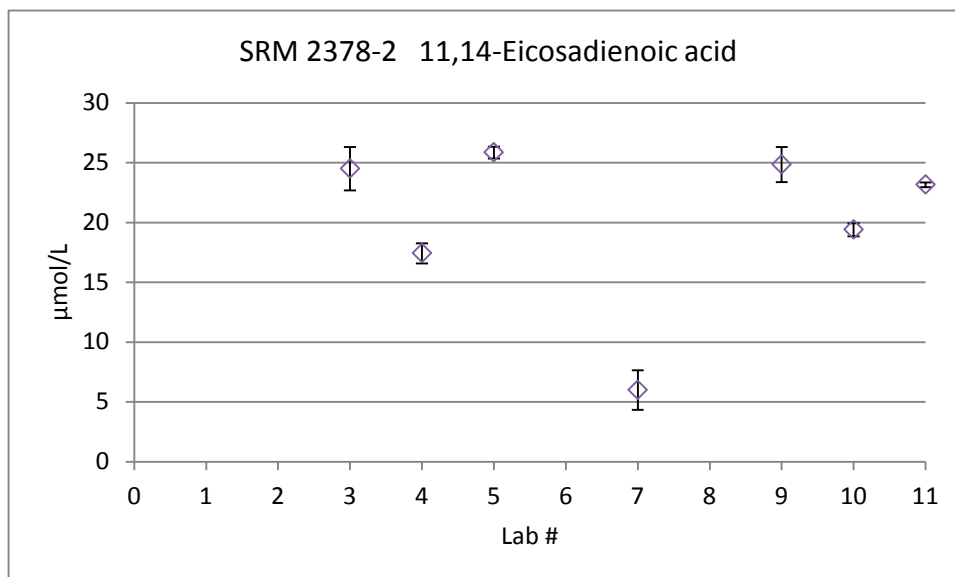
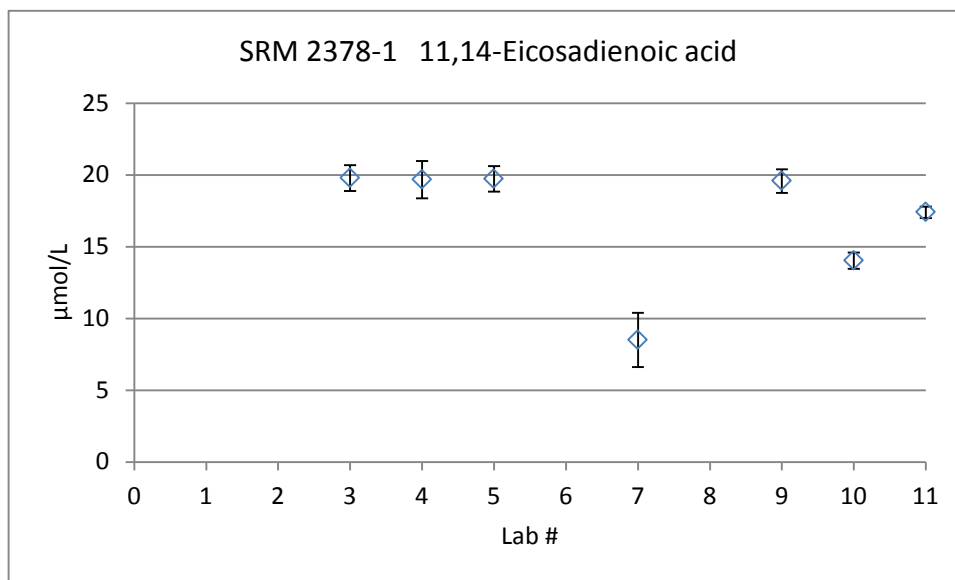


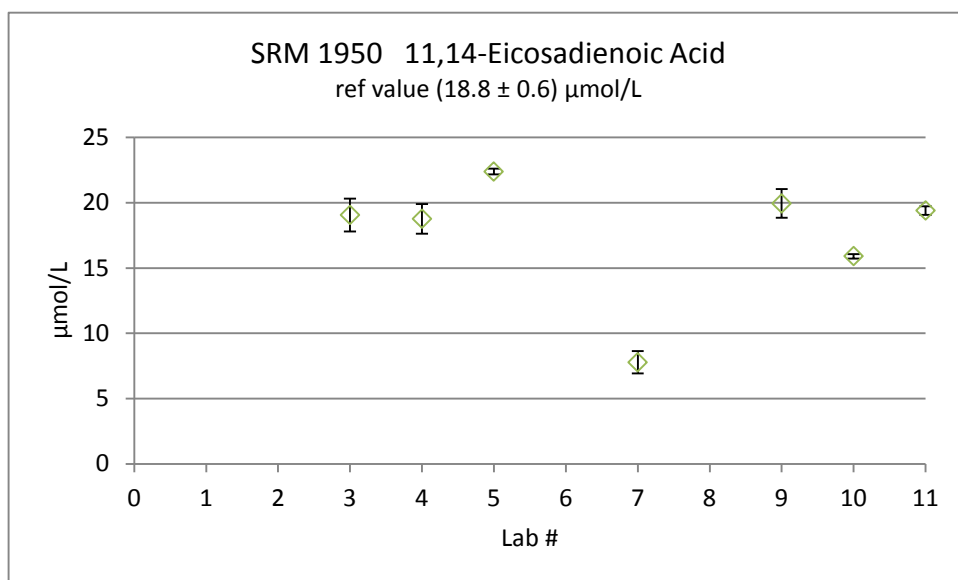
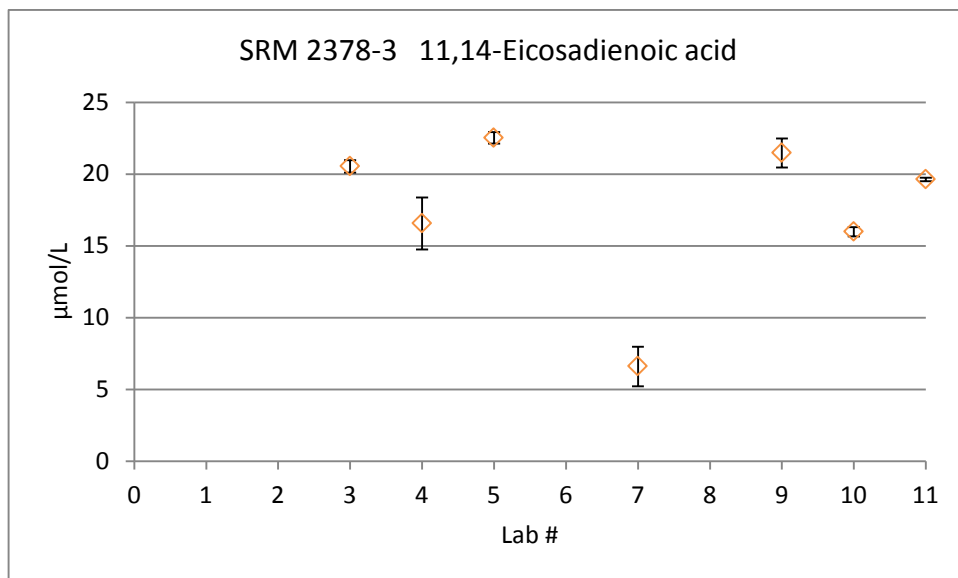
Median 16.3 µmol/L

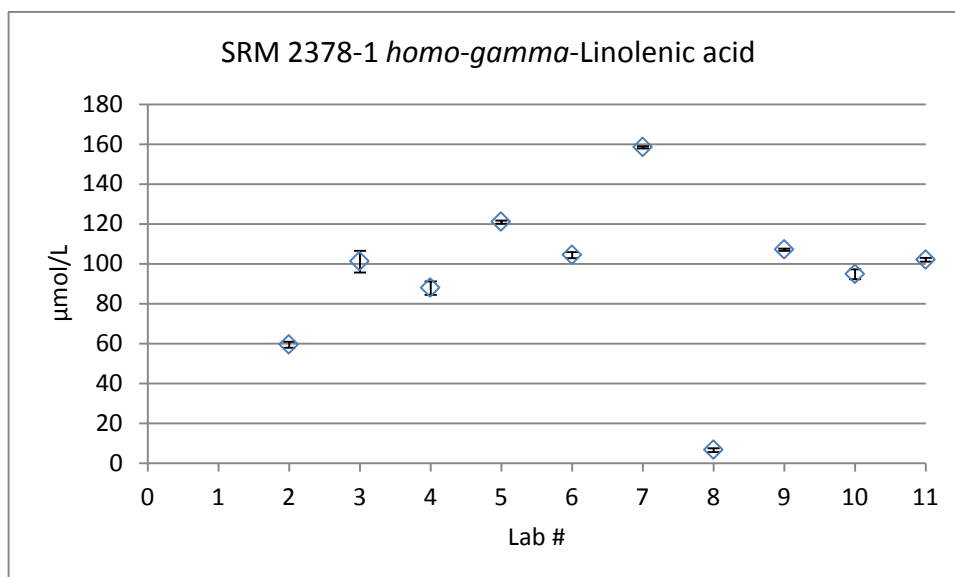


Median 16.1 µmol/L

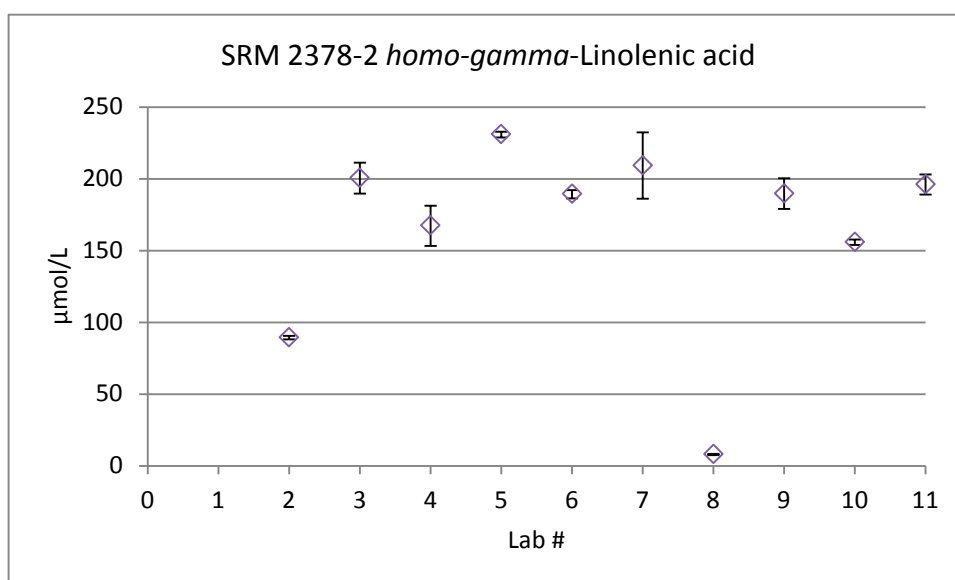




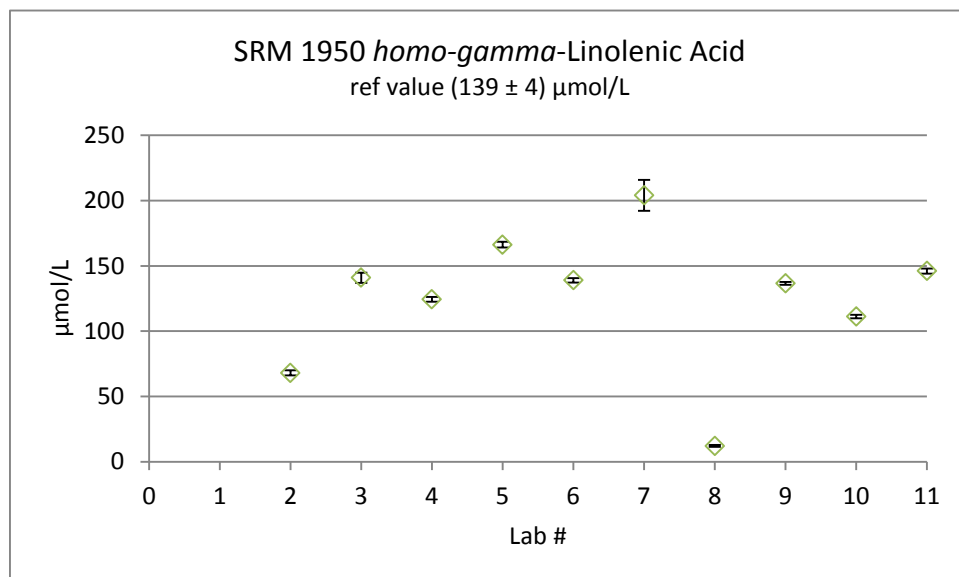
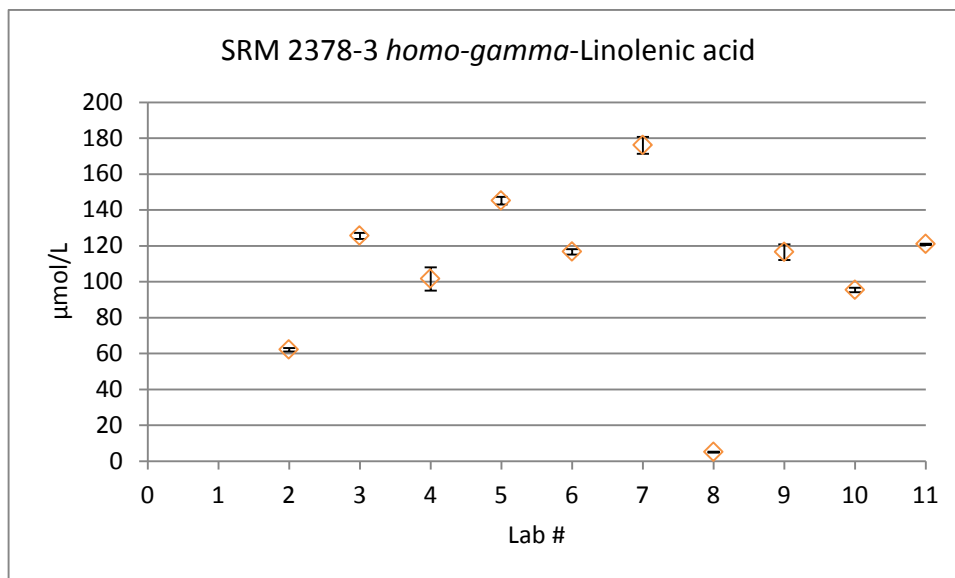


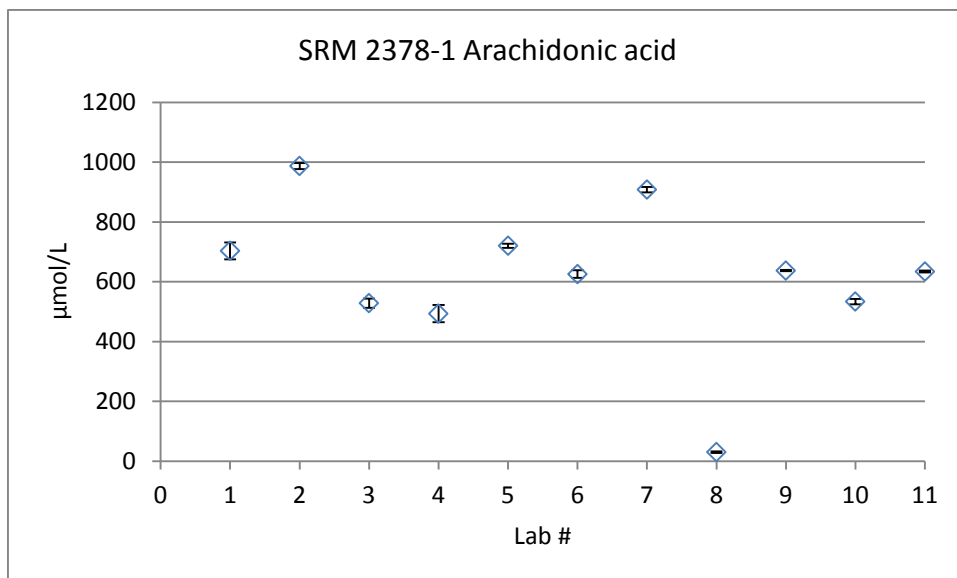


Median (excluding lab 8)
101 $\mu\text{mol/L}$

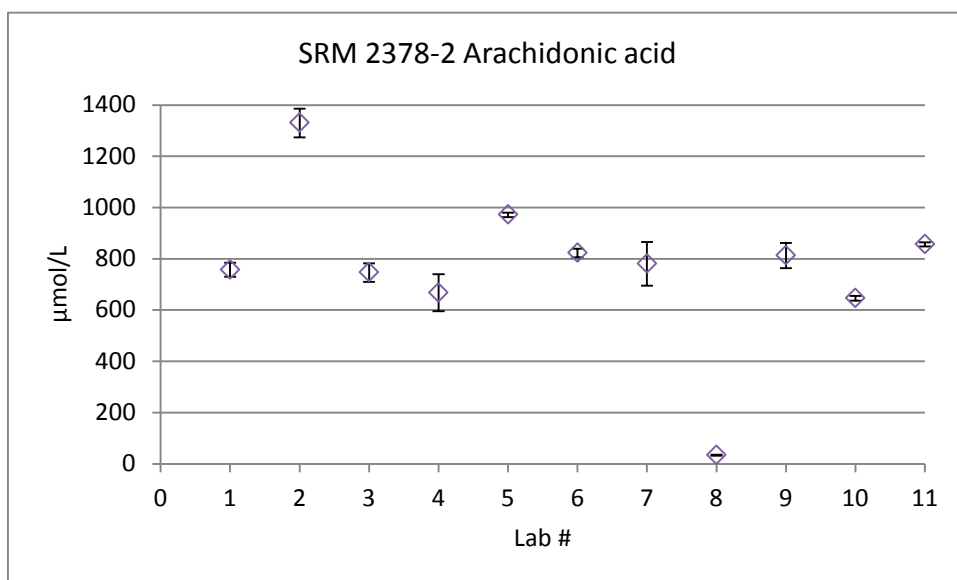


Median (excluding lab 8)
190 $\mu\text{mol/L}$

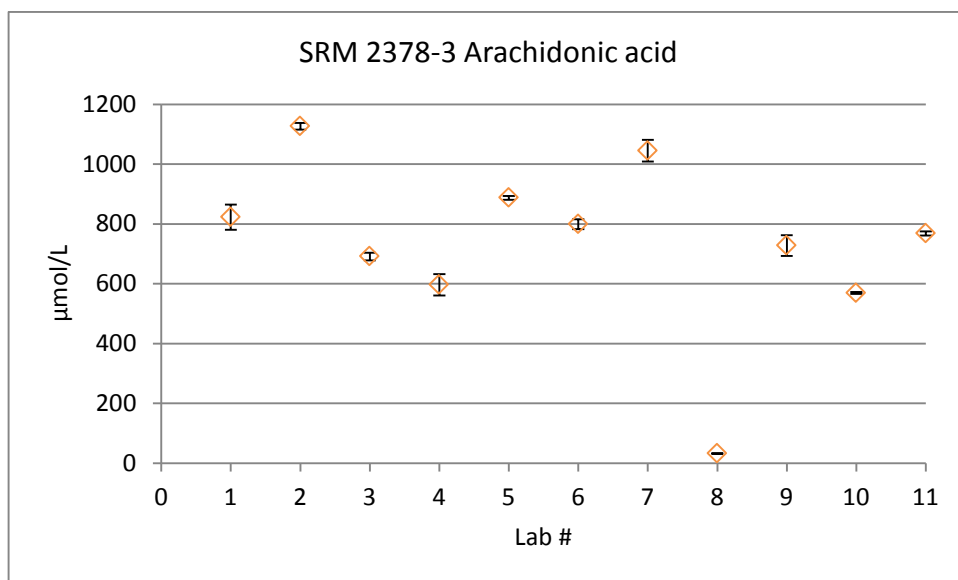




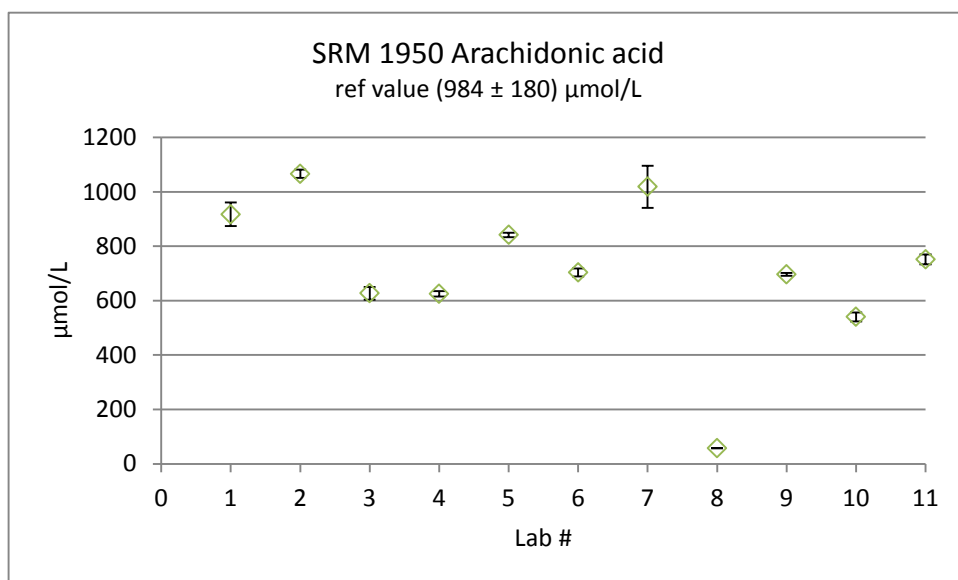
Median (excluding lab 8)
630 $\mu\text{mol/L}$



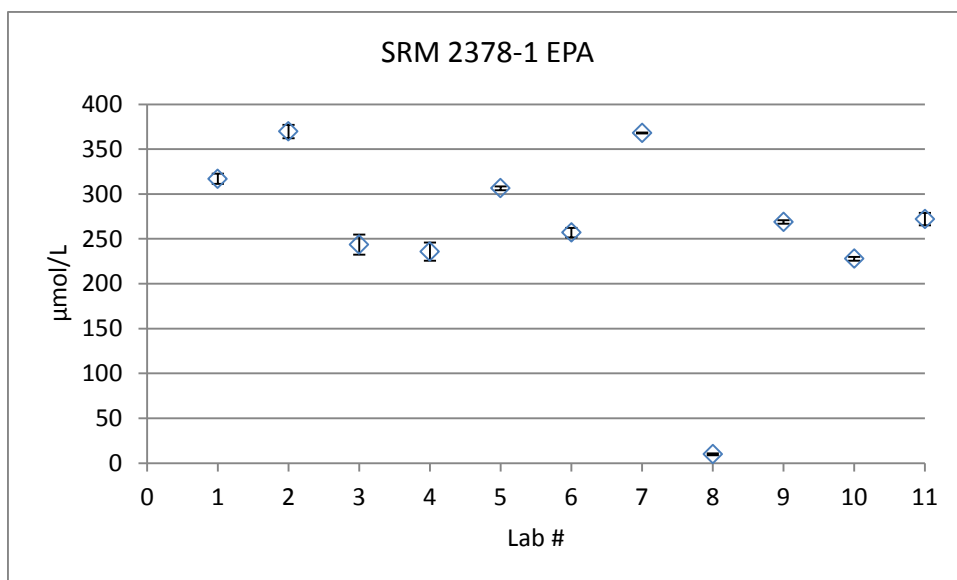
Median (excluding lab 8)
797 $\mu\text{mol/L}$



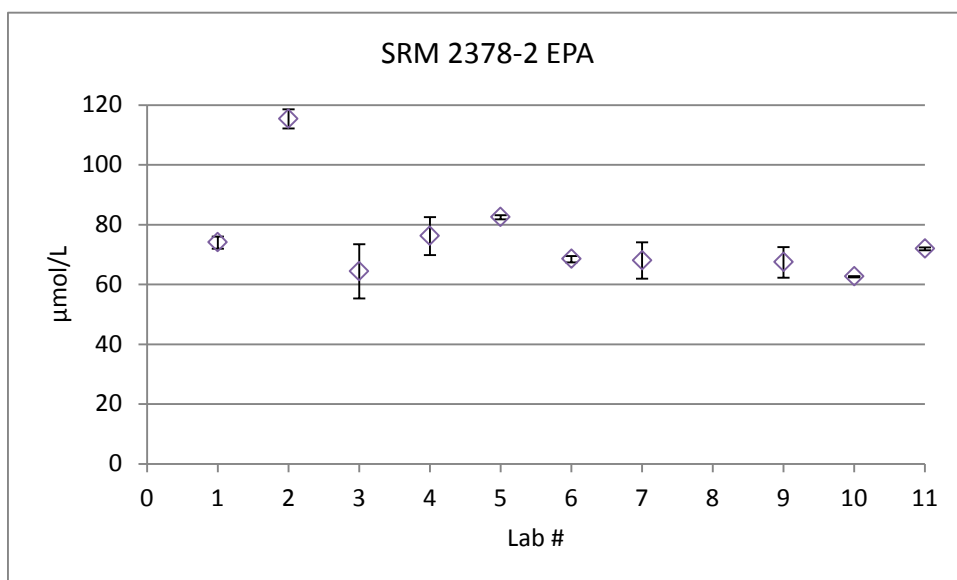
Median (excluding lab 8)
784 $\mu\text{mol/L}$



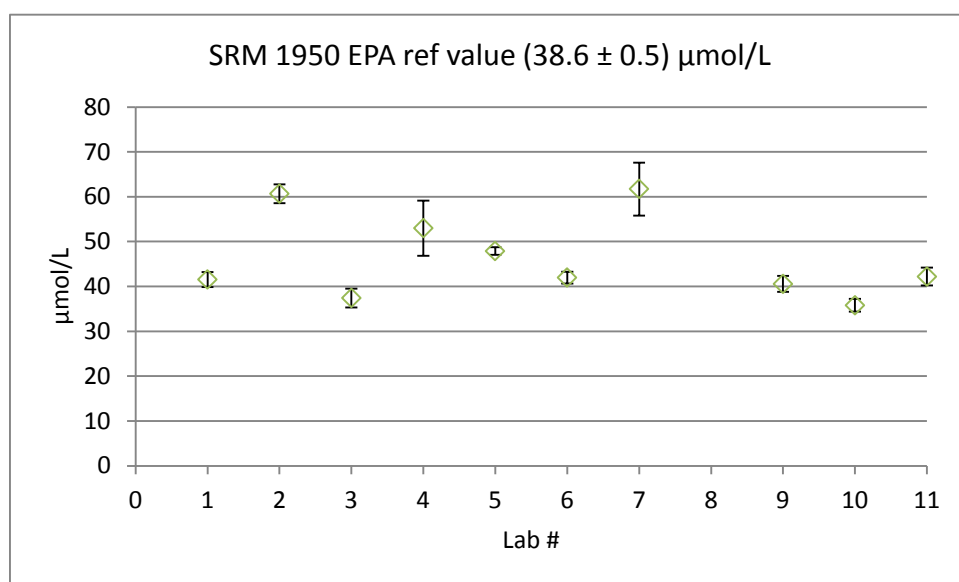
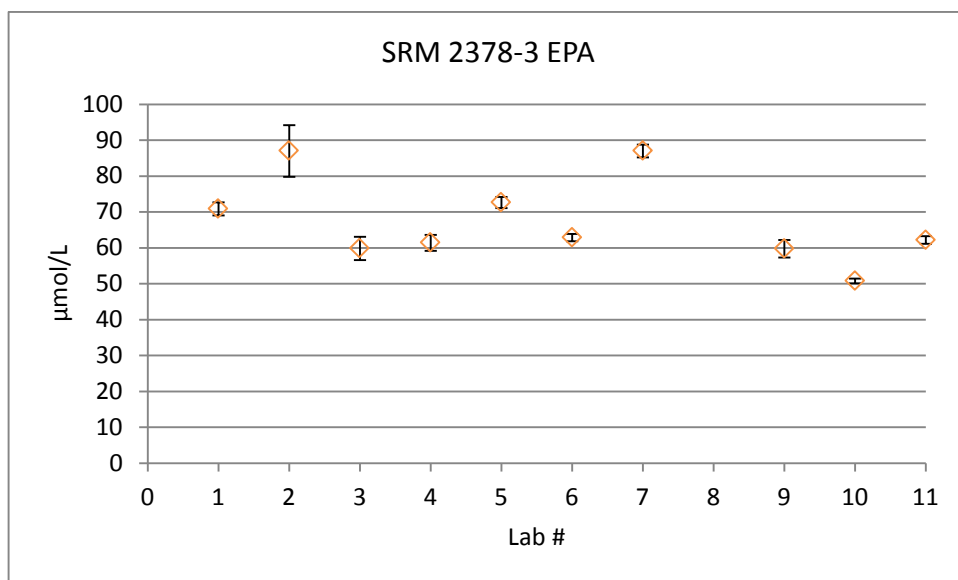
Median (excluding lab 8)
728 $\mu\text{mol/L}$

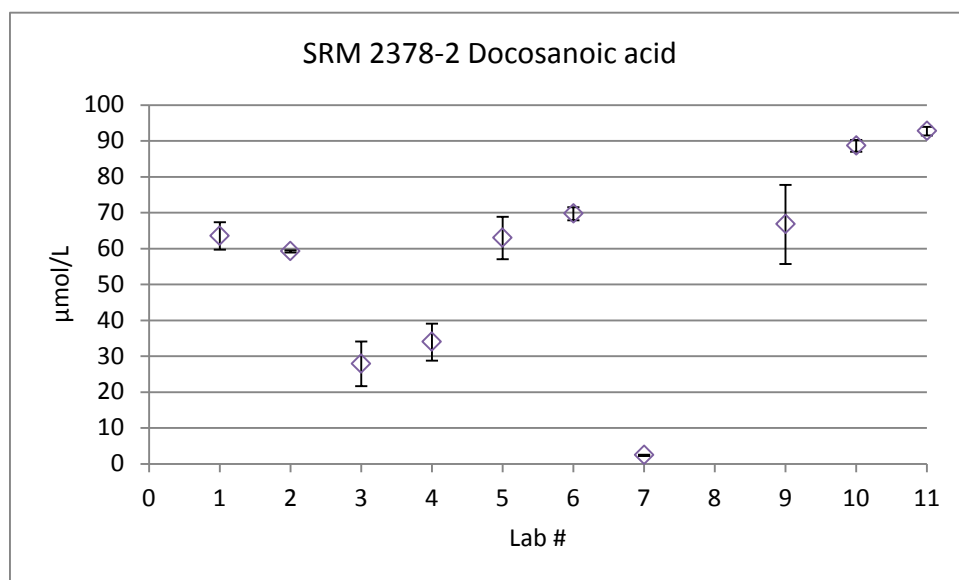
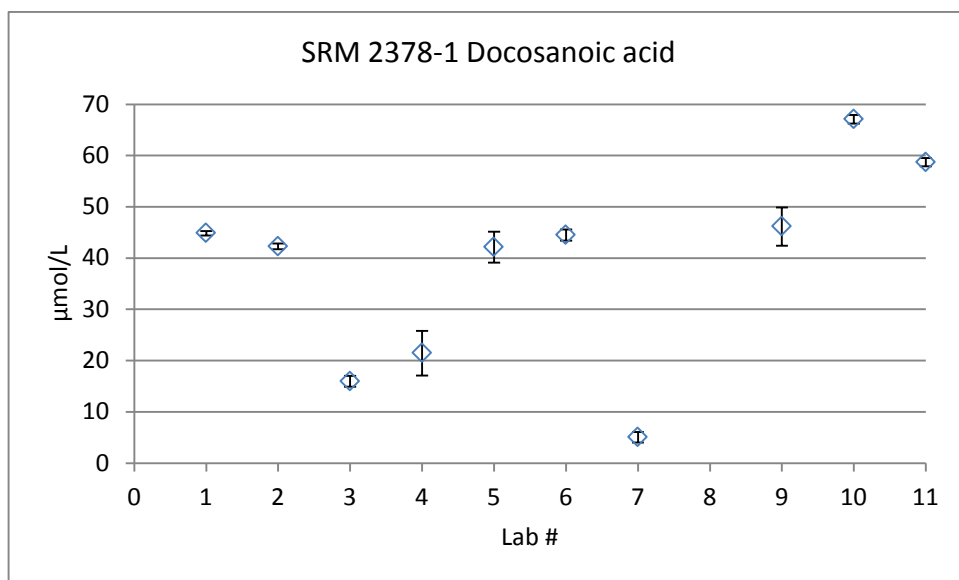


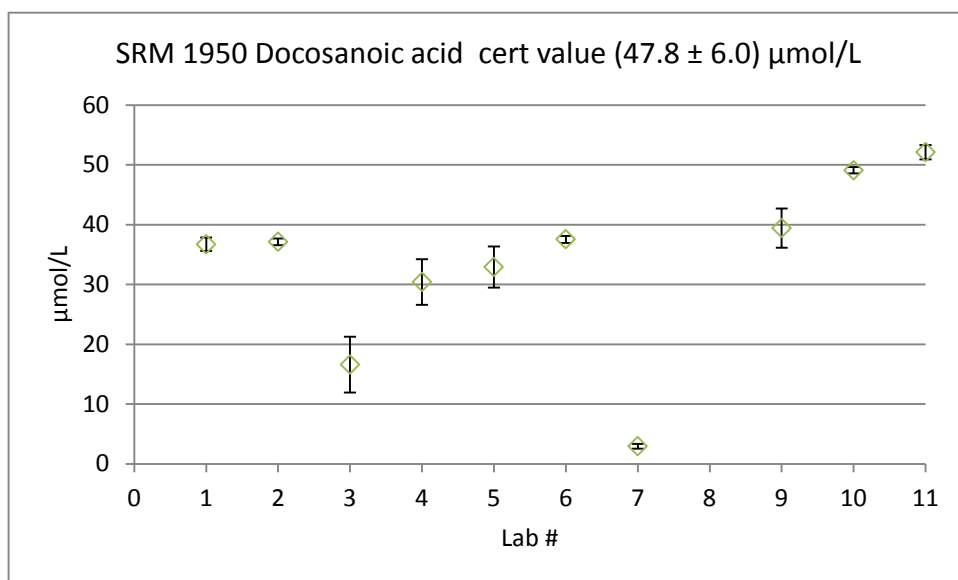
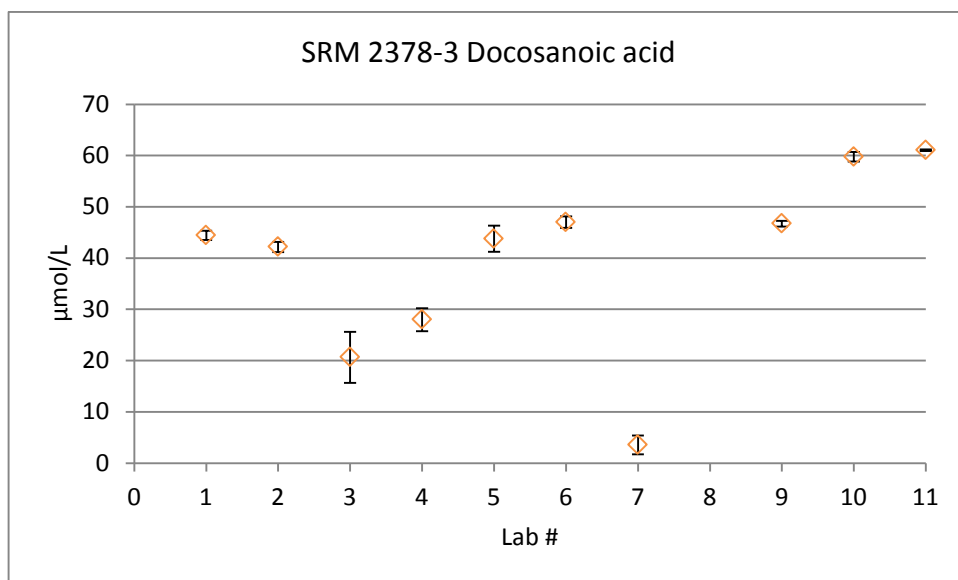
Median (excluding lab 8)
263 $\mu\text{mol/L}$

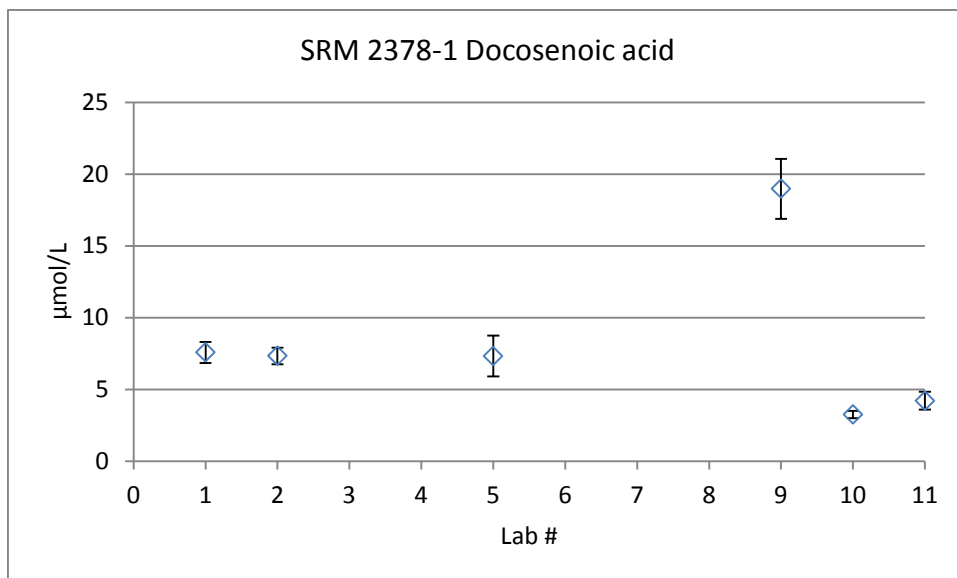


Median 70.2 $\mu\text{mol/L}$

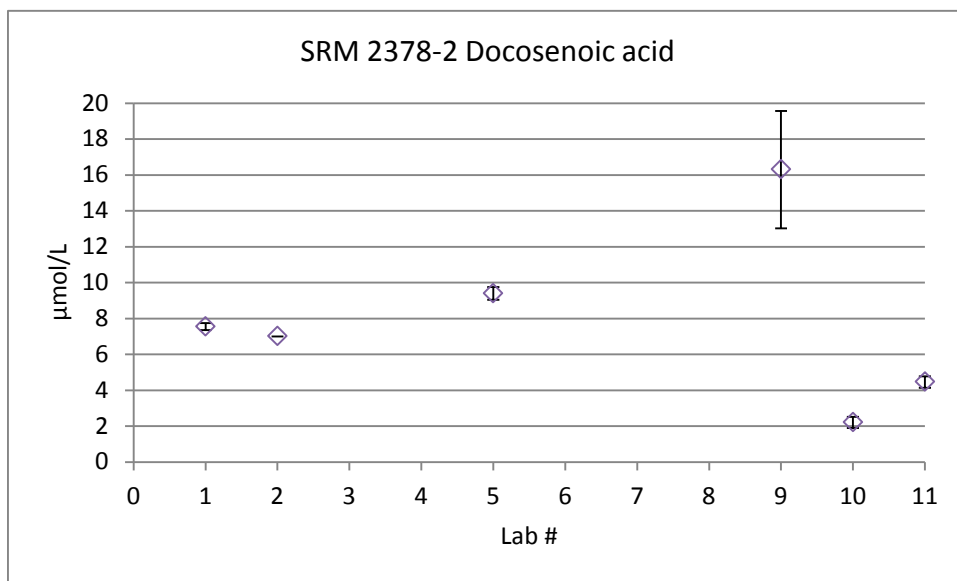




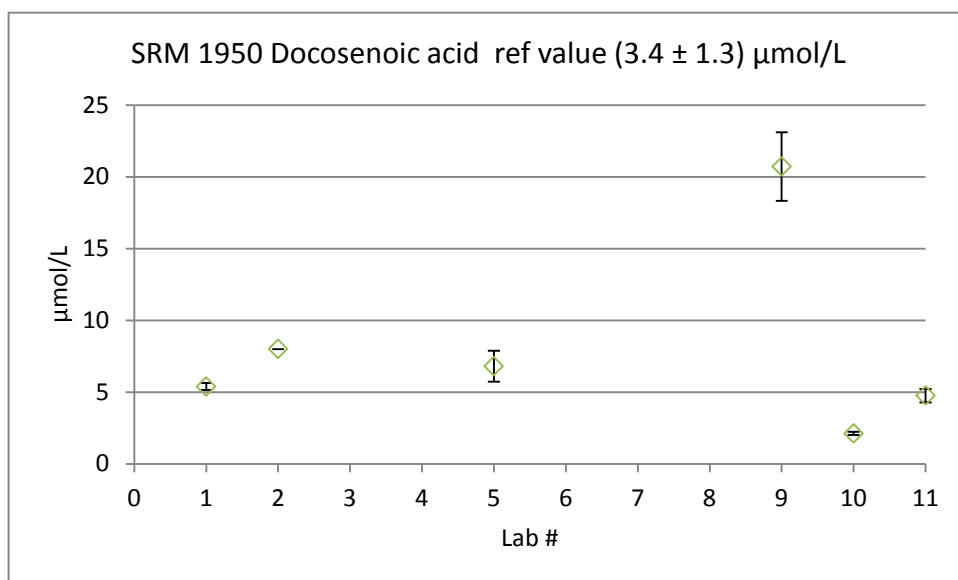
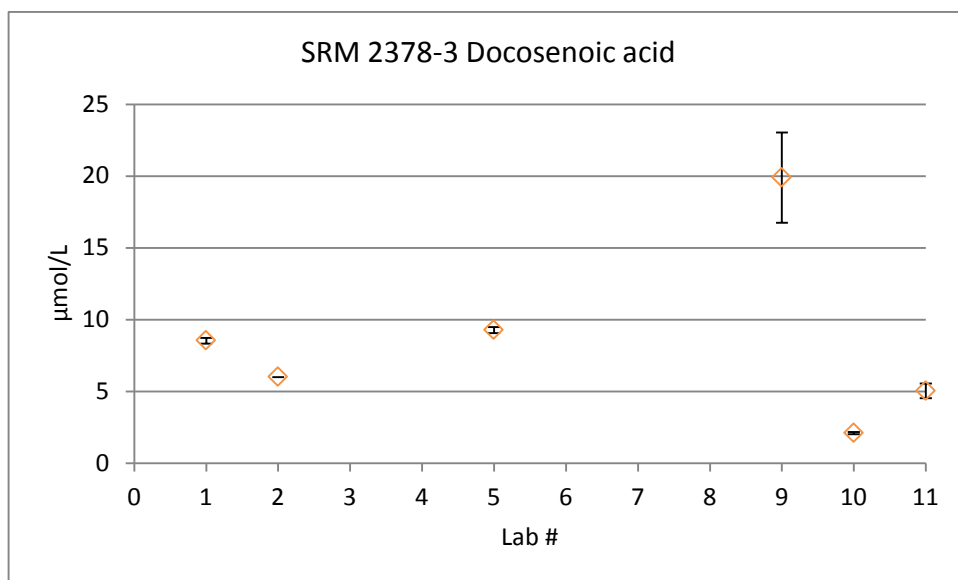


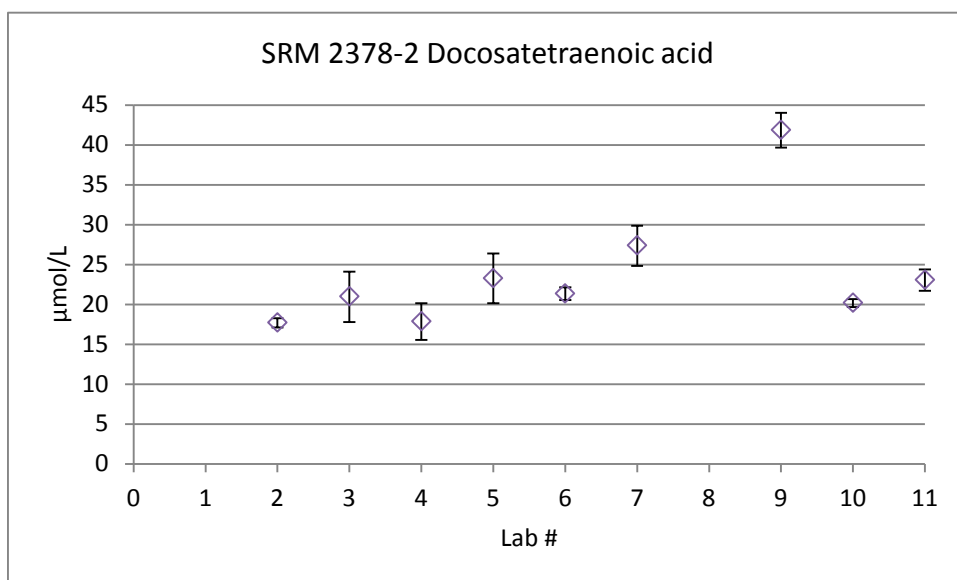
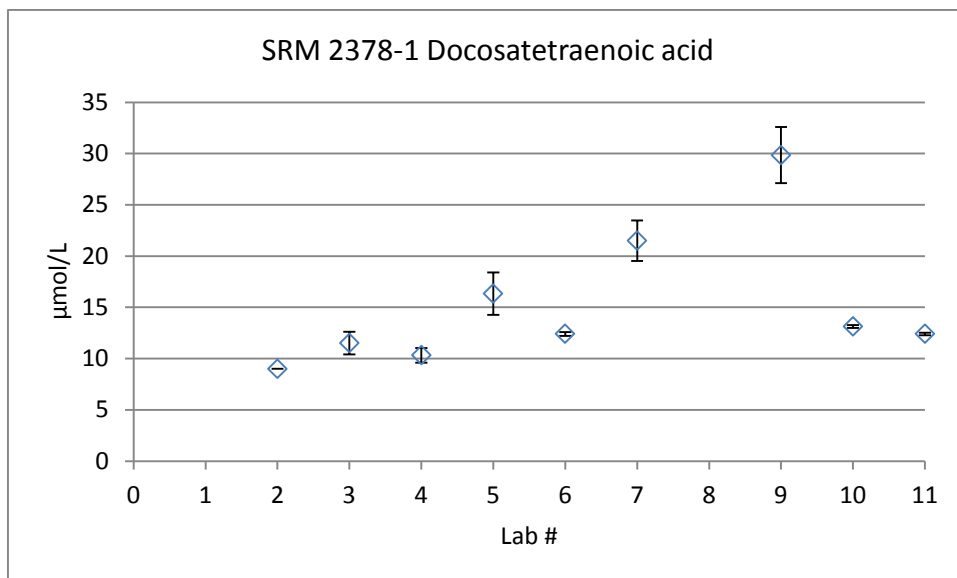


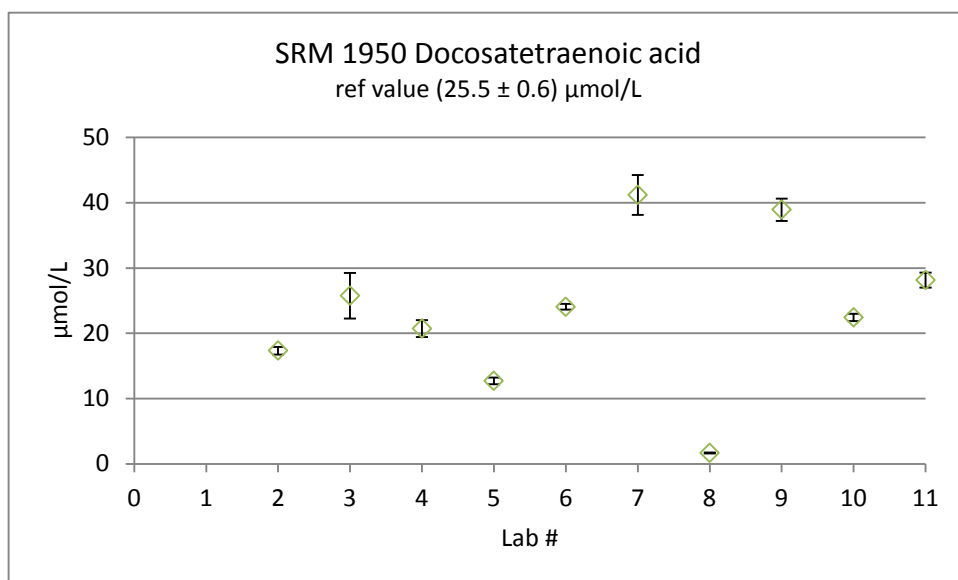
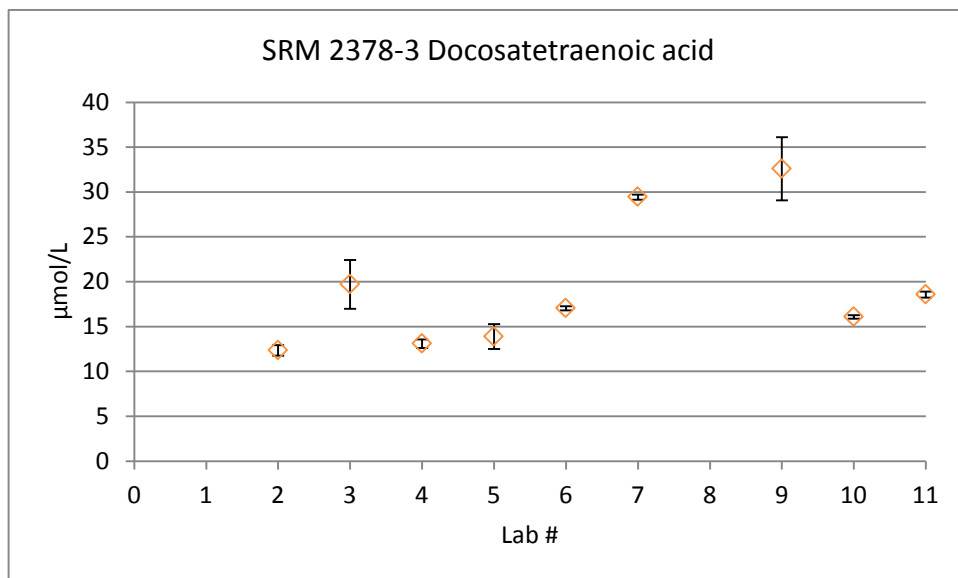
Median 5.76 µmol/L

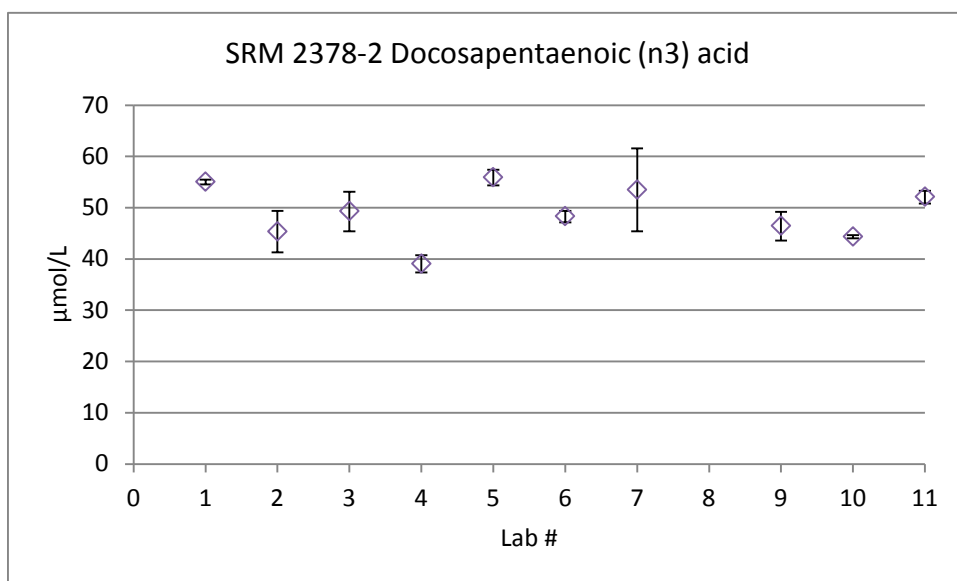
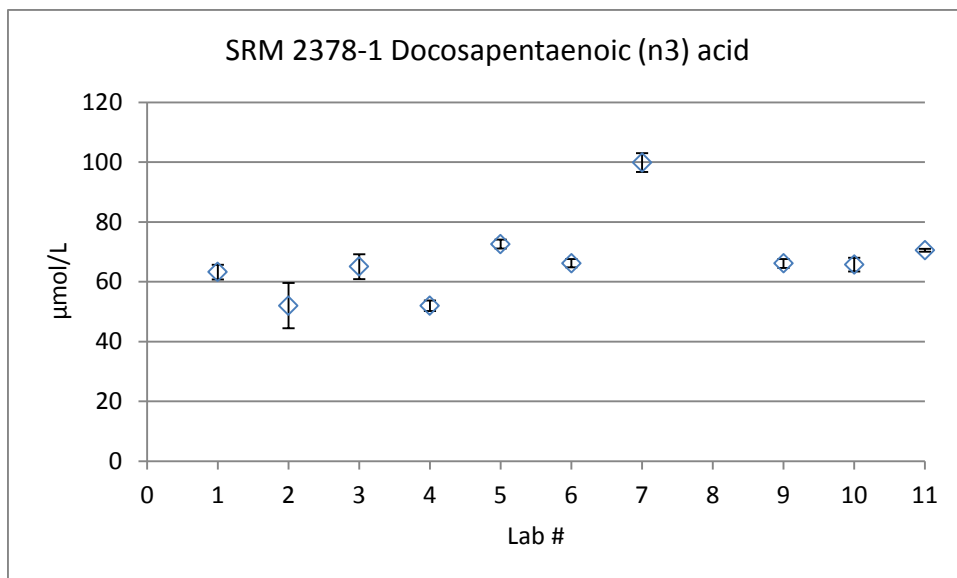


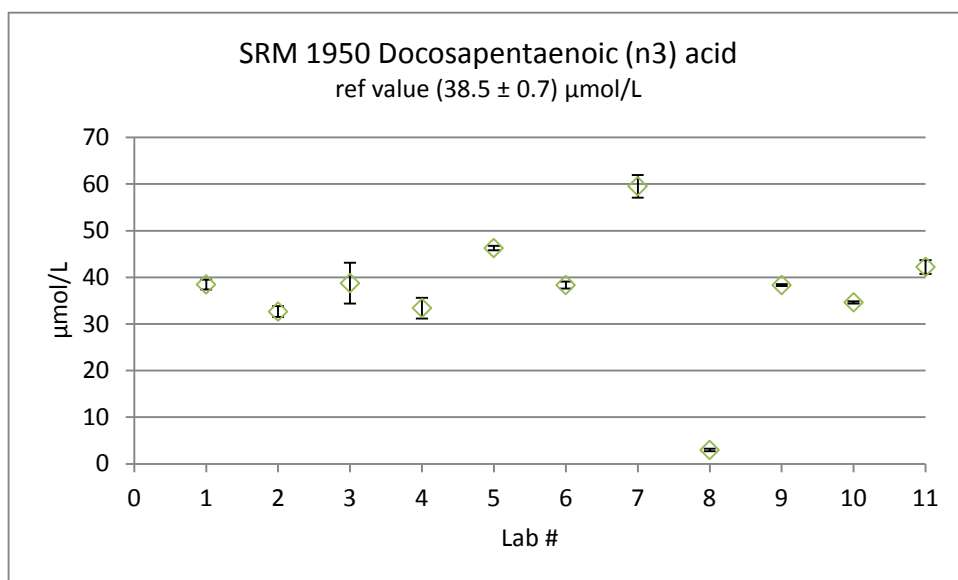
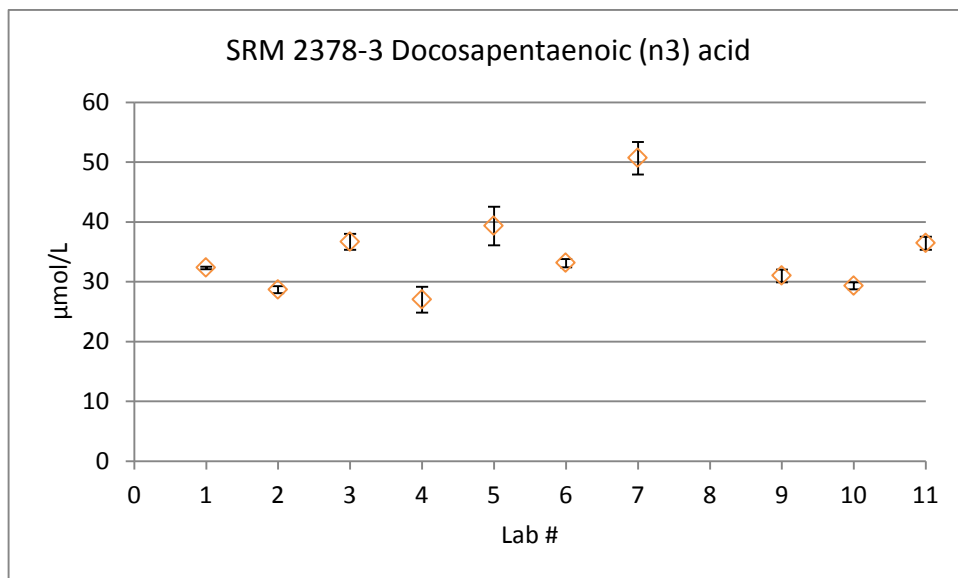
Median 7.27 µmol/L

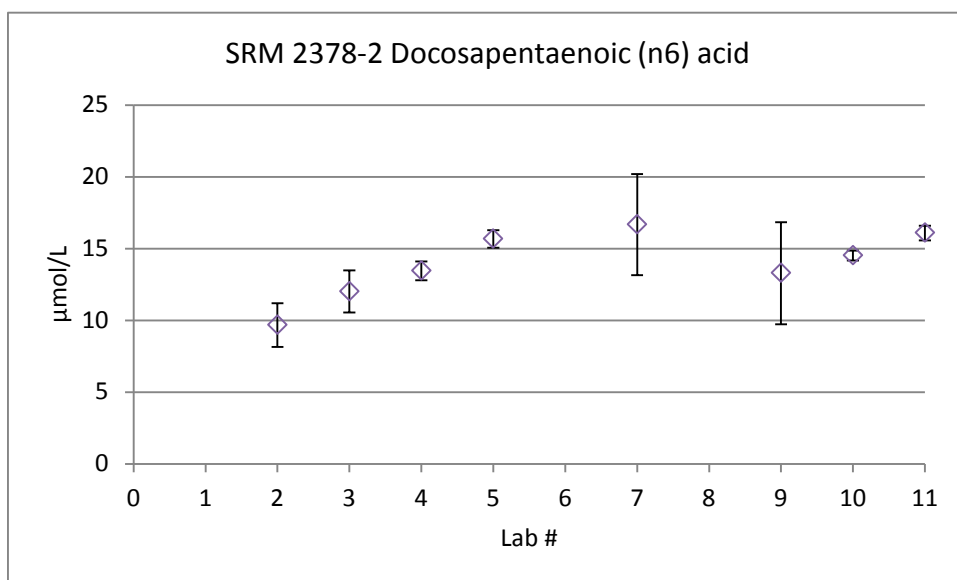
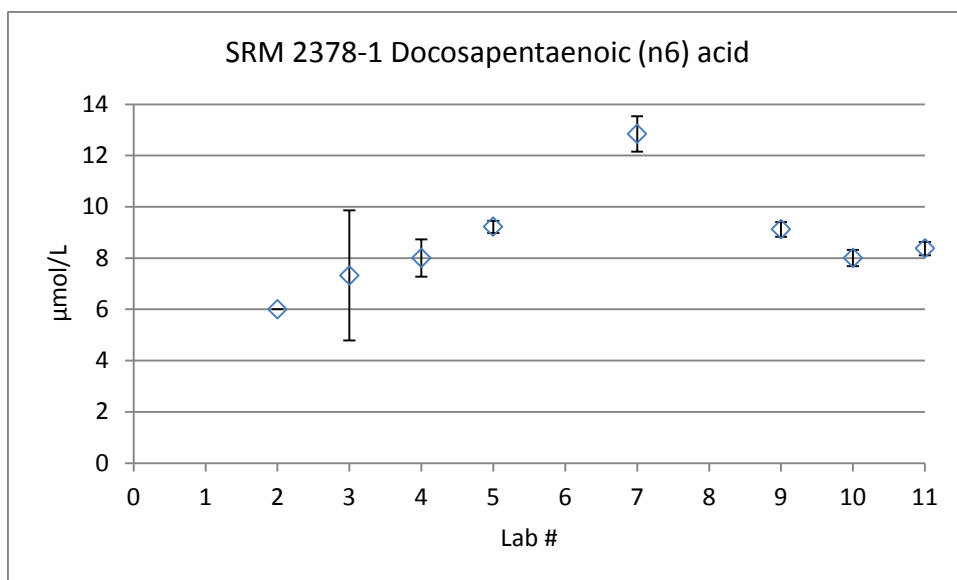


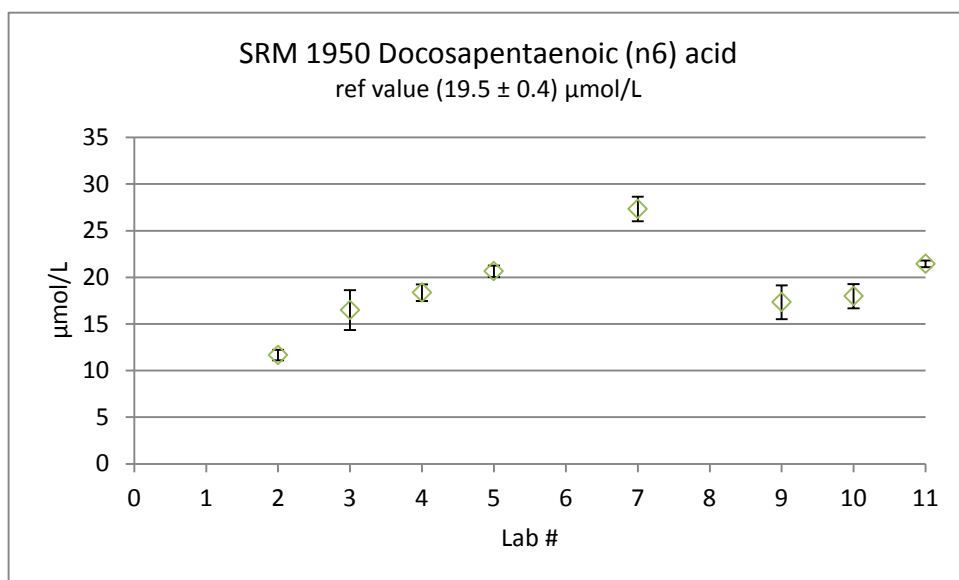
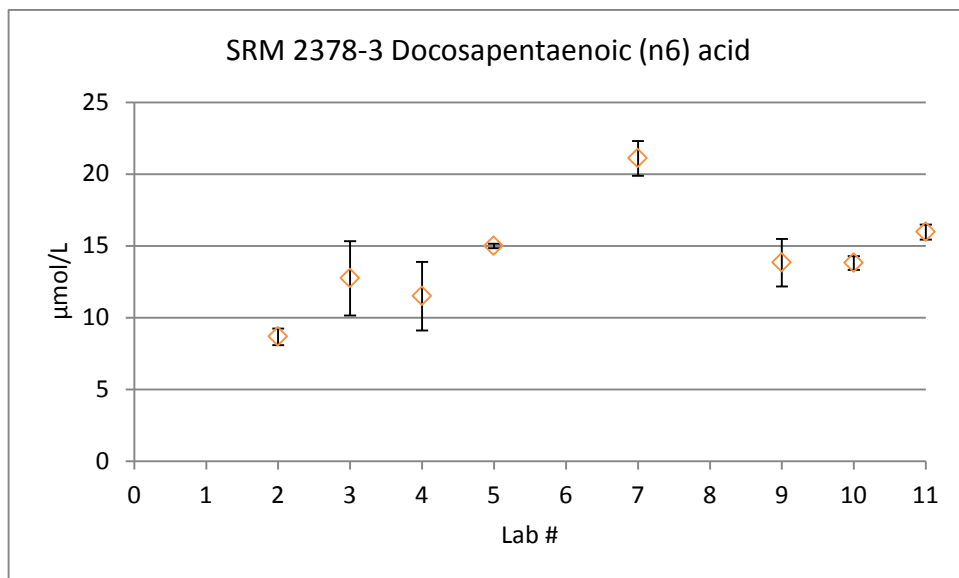


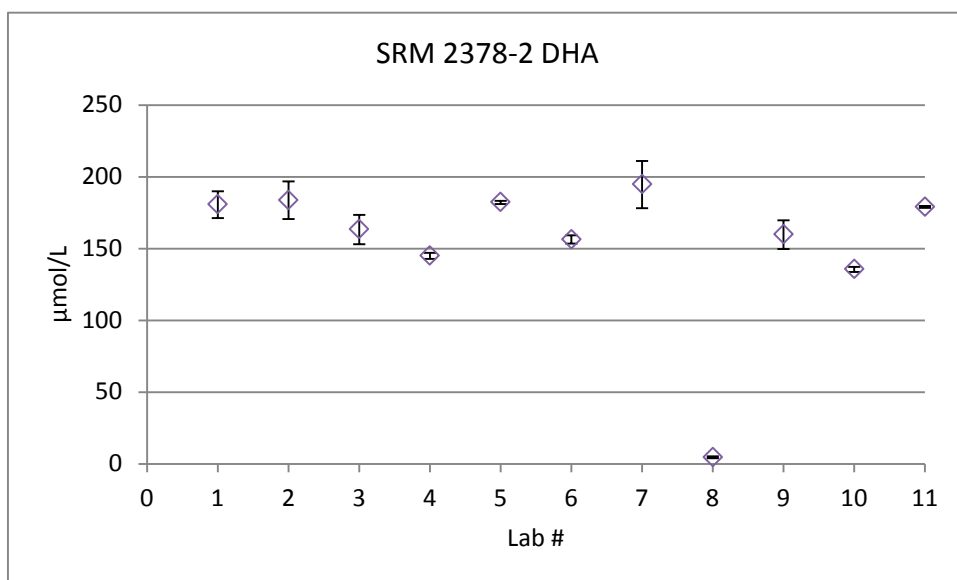
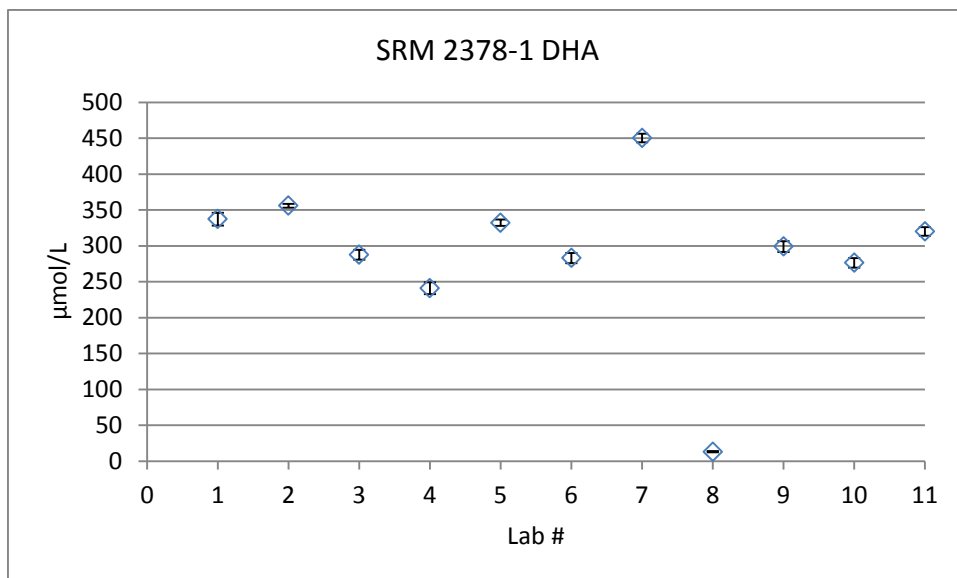


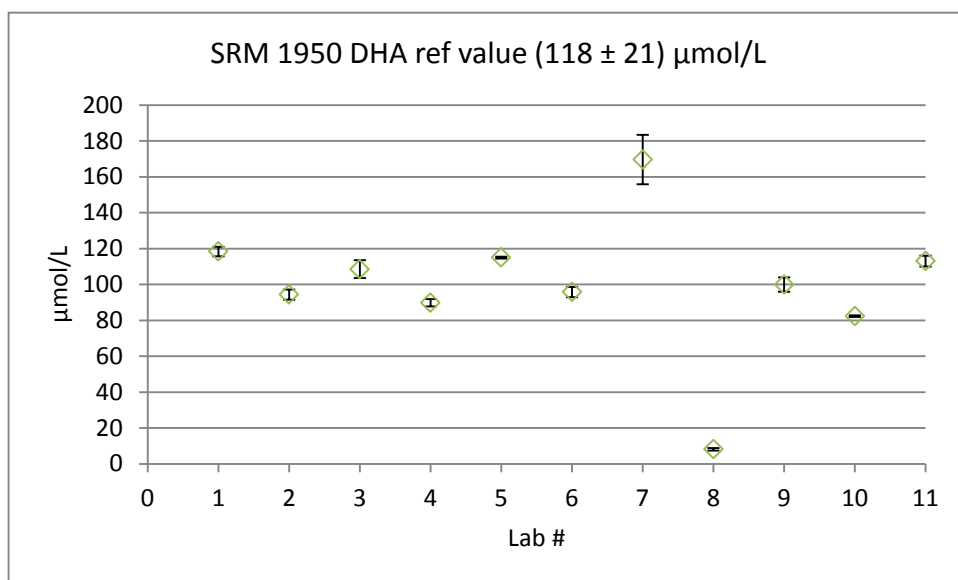
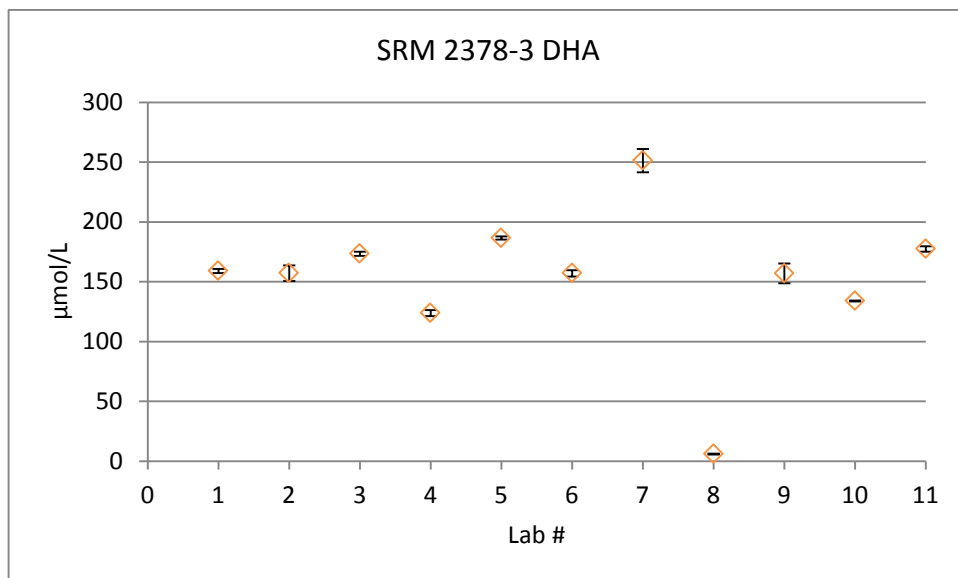


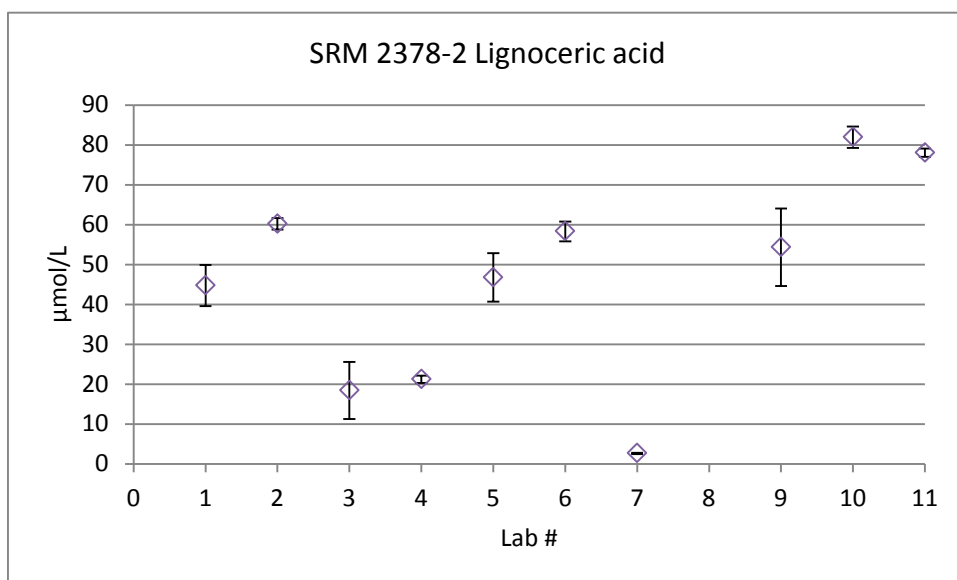
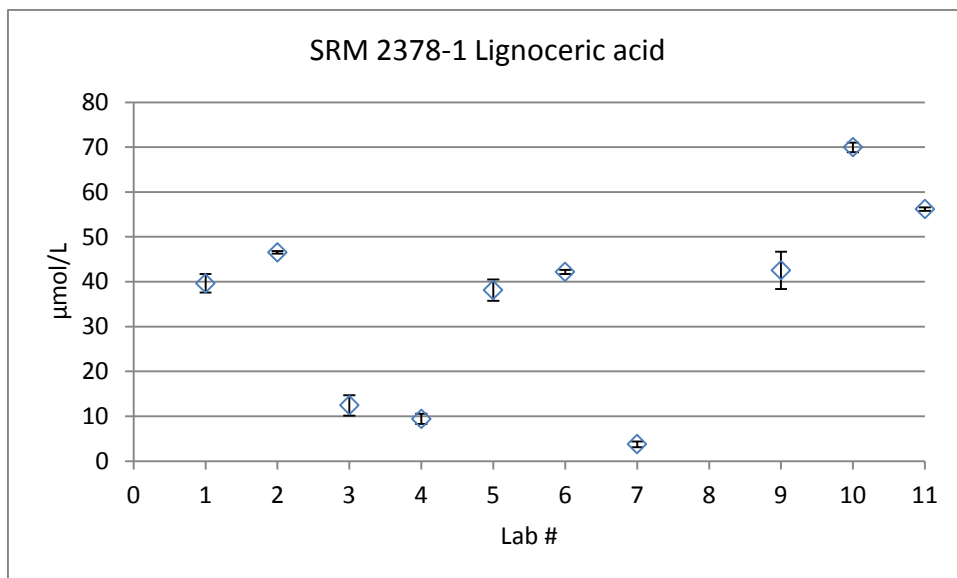


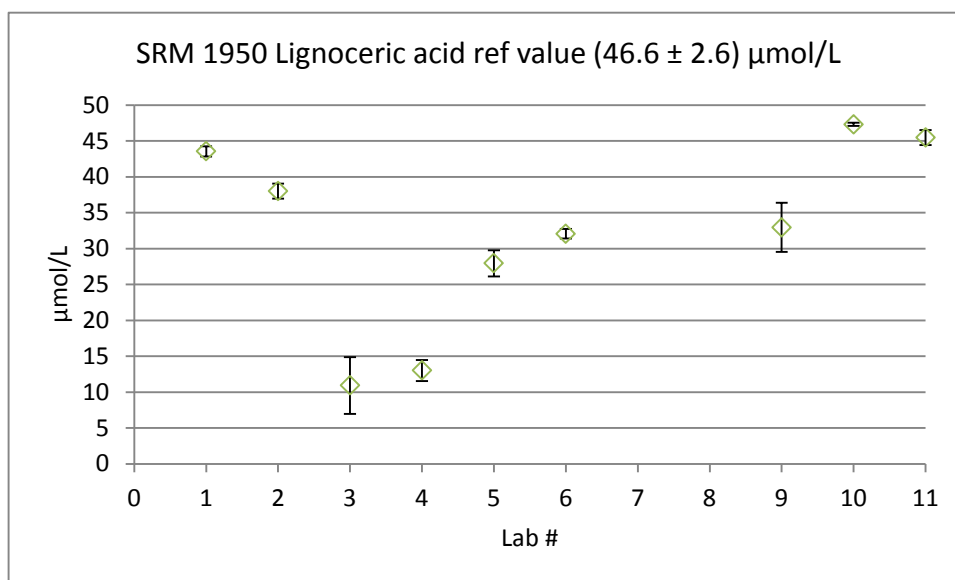
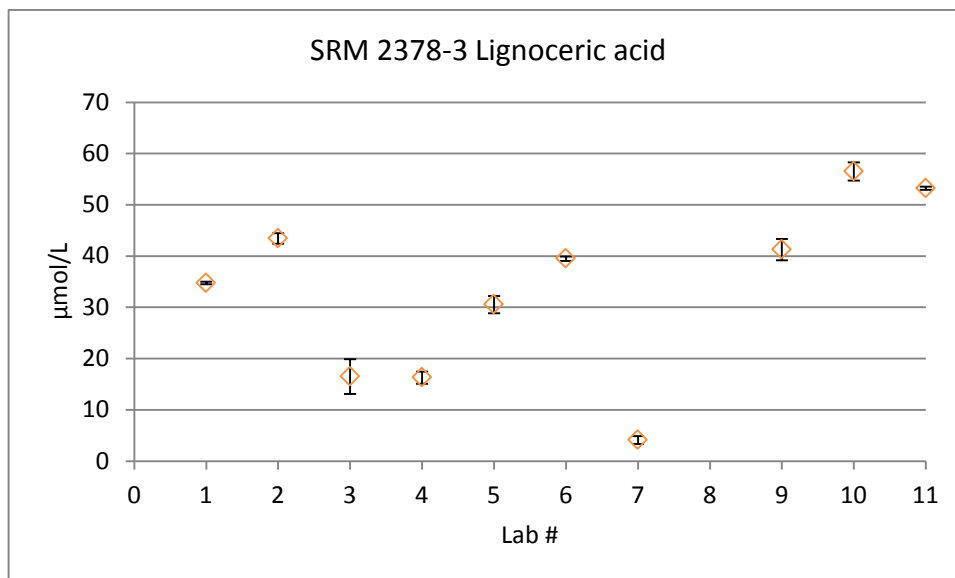


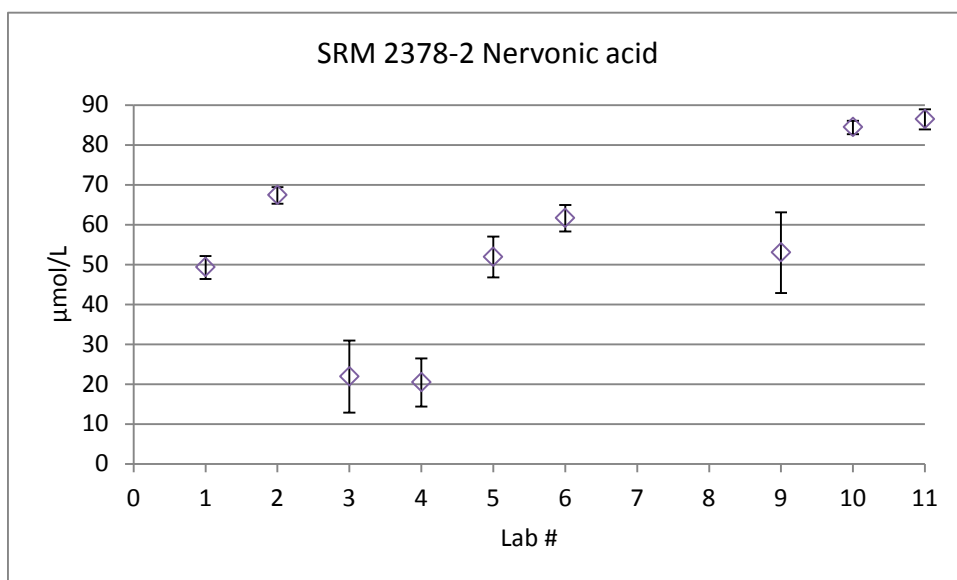
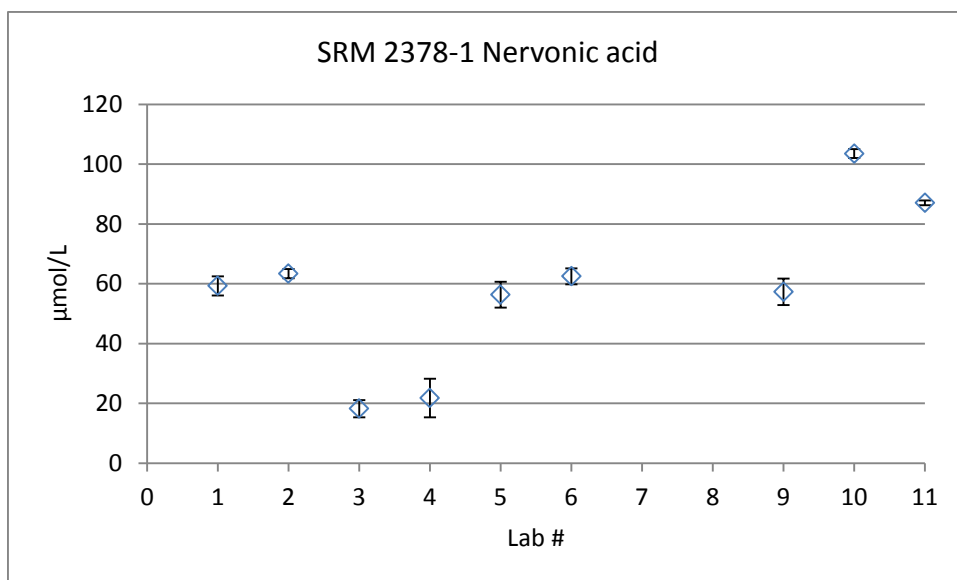












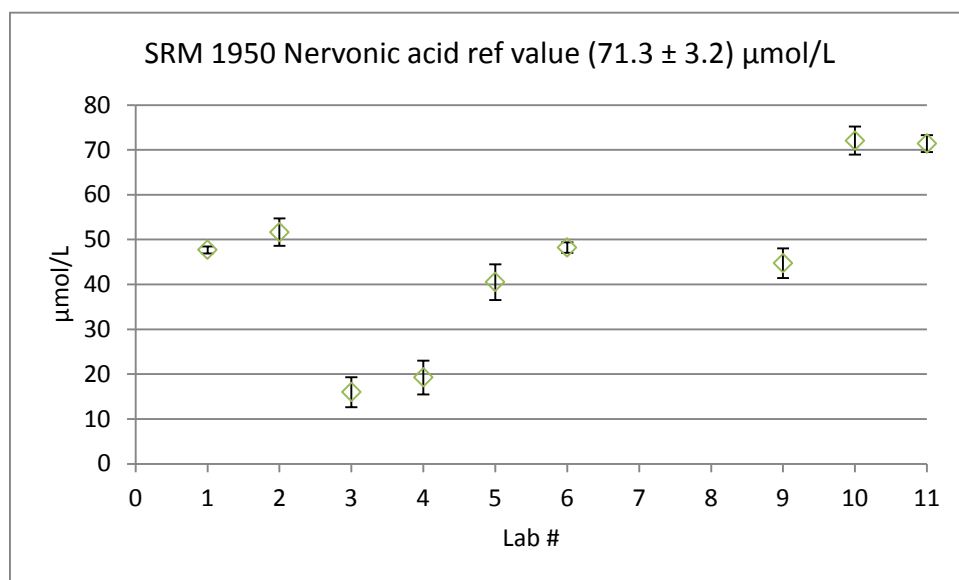
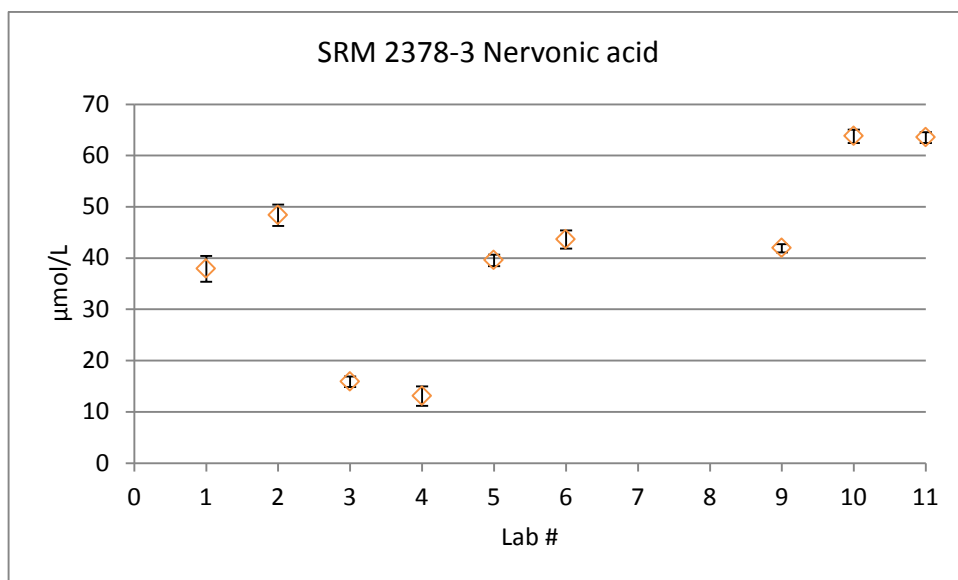


Table A-1 Procedures used					
Lab #	1	2	3	4	5
Reporting date	10/19/2012	6/25/2012	7/23/2012	7/29/2012	7/31/2012
Volume of sample extracted (mL):			0.0125 mL	0.0125 mL	
Mass of samples extracted (g) (average of 3):					
SRM 2378-1	0.93 g	0.096 g	0.012 g		0.100 g
SRM 2378-2	0.90 g	0.098 g	0.013 g		0.100 g
SRM 2378-3	0.90 g	0.097 g	0.014 g		0.100 g
SRM 1950	0.90 g	0.096 g	0.013 g		0.100 g
Analytical method reference, if available:		Lagerstadt SA, Hinrichs DR, Batt SM, Magera MJ, Rinaldo P, McConnell JP. (2001) Quantitative determination of plasma C8-C26 total fatty acids for the biochemical diagnosis of nutritional and metabolic disorders. <i>Mol Genet Metab</i> .73:38-45			
Analytical method used:					
Hydrolysis method	0.4 M potassium hydroxide in methanol	Acid (0.6N HCl) and base (1N NaOH) hydrolysis	BF3 Methanol	BF3 Methanol	Folch
Extraction method	liquid-liquid	Manual extraction			
Extraction solvent	hexane	Hexane			3mL of 2:1 chloroform:methanol
Extraction time	vortex for 30 min and centrifuge for 5 min - repeat 3 x with 2 mL of hexane each time	2 minutes			1 minute during vortex in 2:1 chloroform:methanol
Extraction - other details	combine hexane phases	none			Surrogate standard added to 2:1 chloroform:methanol solution
Sample extract cleanup method		hexane extraction			add 500uL sodium phosphate buffer, invert twice, centrifuge @ 1734g for 5 min; extract bottom chloroform layer, dry down under nitrogen, derivitize with 1mL 14% BF3 in methanol with 0.3mL hexane; Add 1mL hexane, 1mL water, vortex for 1 min, centrifuge @ 1734g for 3 min; Extract top hexane layer, dry down under nitrogen, reconstitute in 65uL heptane
Derivatization reagent	5% (v/v) sulfuric acid in methanol - heat 80 deg C for 30 min - extract 3 x with 2 mL hexane each time	Pentafluorobenzyl Bromide (PFBBBr)	BF3 Methanol	BF3 Methanol	
Analytical instrument	GC-FID	Agilent 6890 series gas chromatograph with Agilent 5973 CI source MS	GC-FID	GC-FID	Varian 3900
Column phase	SP2560	Crosslinked 5% Diphenyl and 95% Dimethylpolysiloxane	SP-2560	SP-2560	DB-FFAP
Column length, m	100 m	25	100	100	15
Column i.d., mm	0.25	0.200	0.25	0.25	0.1
Column film thickness, µm	0.25	0.33	0.2	0.2	0.1
Injection method (split, splitless, etc)	split 30:1	split (split ratio 105:1) and splitless	Split	Split	split
Method of quantitation:					
ES = external standards (Y/N)		Y	Yes	Y	
Number of ES used		10	3	3	
IS = internal standards (Y/N)	y	Y	Yes	Y	y
Number of IS used	2	13	2	1	1
IS added PRIOR to extraction of sample (Y/N)	y	Y	Yes	Y	y
Additional data/information					

Table A-1 Continued					
Lab #	6	7	8	9	10
Reporting date	7/31/2012	7/31/2012	7/31/2012	11/2/2012	11/8/2012
Volume of sample extracted (mL):	0.2 mL	0.2 mL	0.3 mL	0.2 mL	0.100 mL
Mass of samples extracted (g) (average of 3):					
SRM 2378-1	0.208 g	0.199 g	0.300 g	0.200 g	
SRM 2378-2	0.208 g	0.199 g	0.301 g	0.200 g	
SRM 2378-3	0.208 g	0.198 g	0.306 g	0.200 g	
SRM 1950	0.207 g	0.198 g	0.299 g	0.200 g	
Analytical method reference, if available:	Combined and modified three published methods: Masood et al. 2004 for sample prep, David et al. 2005 for GC, Dodds et al. 2005 for MS (see below)				1) Lepage G, Roy CC. J Lipid Res 1986; 27:114-120. 2) Lin YH, et al. Lipids 2012; 47:527-39.
Analytical method used:					
Hydrolysis method	One-step hydrolysis/derivatization with acetyl chloride		None		n/a
Extraction method	Manual sequential extraction (2mL extraction solvent each time, three times)	Bligh and Dyer	Solvent extraction	Modified Folch	n/a
Extraction solvent	Hexane	Methanol/Chloroform/Water 2/1/0.8	Aqueous methanol	Chloroform/Methanol (2:1)	n/a
Extraction time	Minimum 5 minutes between the addition of hexane and transfer of hexane extract (for each time)	30 mins on a vortexer	1 min, two times	20 minutes	n/a
Extraction - other details	Vortex-mix twice, plasma and serum samples were centrifuged for 5 minutes at 1000 rpm			Constant vortexing	One-step, direct transmethylation analysis without previous lipids extraction
Sample extract cleanup method	centrifuge, 5 min at 10000 rpm	1 N NaCl wash			n/a
Derivatization reagent	5mL acetyl chloride added to 86.2mL methanol with 50 mg/L butylated hydroxytoluene, incubation at 90 C for 45 min	14% Boron Trifluoride in Methanol	Methyl chloroformate (MCF)	Boron trichloride	methanol : hexane : acetyl chloride (4:1:0.5, v/v/v)
Analytical instrument	Agilent GC/MSD (6890N/5973N) with EI ionization	HP 5890 GC/FID quantification. Peak ID with Varian Saturn 2000 GC-(CACI)MSMS, column SGE BPX70	Thermo TraceGC Ultra ISQ	Varian 3400	Agilent 7890A fast gas chromatograph
Column phase	DB-23 which is (50%-Cyanopropyl)-methylpolysiloxane	70% Cyanopropyl polysilphenylene-siloxane	TG-1701MS, 14% Cyanopropylphenyl Methylpolysiloxane	DB-23	high efficient DB-FFAP
Column length, m	60	25	15	60.00	15.0
Column i.d., mm	0.25	0.22	0.25	0.32	0.10
Column film thickness, µm	0.15	0.25	0.25	150.00	0.10
Injection method (split, splitless, etc)	Injected same samples twice, at 50:1 and 500:1 split ratios, respectively	Splitless	Splitless	Septum Programable Injector (SPI)	split 50 : 1 (hydrogen as carrier gas, nitrogen as makeup gas)
Method of quantitation:					
ES = external standards (Y/N)	Y	N	N	N	Y
Number of ES used	18		0		23
IS = internal standards (Y/N)	Y	Y	Y	Y	Y
Number of IS used	4	1	IS for each compound	1	one
IS added PRIOR to extraction of sample (Y/N)	Y	Y	Y	Y	Y
Additional data/information	The references mentioned above are: Masood, A. et al. (2005) J. Lipid. Res. 46:2299-2305. David, F. et al. (2009) Agilent Technologies Application Notes. 5990-4822EN. Dodds, E.D. et al. (2005) Lipids. 40:419-428. C16:0, C18:0, C18:1n9, C18:2n6 and C20:4n6 were quantified by injecting the samples at 500:1 split ratio, the other analytes at 50:1 split ratio				(Internal standard / fatty acids) ratio calibration used

Table A-1 Continued	
Lab #	11
Reporting date	1/10/2013
Volume of sample extracted (mL):	0.10 mL
Mass of samples extracted (g) (average of 3):	
SRM 2378-1	0.0967 g
SRM 2378-2	0.0983 g
SRM 2378-3	0.0987 g
SRM 1950	0.0973 g
Analytical method reference, if available:	Lagertedt S, Hinrichs D, Batt S, Magera M, Rinaldo P, McConnell J. Quantitative Determination of Plasma C8-C26 Total Fatty Acids for the Biochemical Diagnosis of Nutritional and Metabolic Disorders. Mol Genet & Metab 2001; 73: 38-45.
Analytical method used:	
Hydrolysis method	Acid (0.6N HCl) and base (1N NaOH) hydrolysis
Extraction method	Liquid:liquid
Extraction solvent	hexane
Extraction time	20 to 30 minutes per extraction set
Extraction - other details	triple extraction via automated liquid handler
Sample extract cleanup method	Speedvac
Derivatization reagent	PFBBBr-pentafluorobenzyl bromide
Analytical instrument	GC/MS
Column phase	cyanopropyl-methylpolysiloxane phase (50-50)
Column length, m	60
Column i.d., mm	0.25
Column film thickness, µm	0.25
Injection method (split, splitless, etc)	split
Method of quantitation:	
ES = external standards (Y/N)	N
Number of ES used	
IS = internal standards (Y/N)	Y
Number of IS used	18
IS added PRIOR to extraction of sample (Y/N)	Y
Additional data/information	

Lab	Fatty Acid Code	Fatty Acid Name	Lowest std (μmol/L)	Highest std (μmol/L)	LOD (μmol/L)	LOQ (μmol/L)	Curve Type	Weighting	IS used for quantitation
Lab 1	C14:0	Myristic acid	5	500			linear		palmitic acid -d 31
	C14:1n5	Myristoleic acid	1.5	140			linear		palmitic acid -d 31
	C16:0	Palmitic acid	5.5	550			linear		palmitic acid -d 31
	C16:1n7	Palmitoleic acid	3.5	360			linear		palmitic acid -d 31
	C18:0	Stearic acid	5.5	560			linear		palmitic acid -d 31
	C18:1n7	cis- Vaccenic acid	1.5	175			linear		palmitic acid -d 31
	C18:1n9	Oleic acid	5.5	525			linear		palmitic acid -d 31
	C18:2n6	Linoleic acid	5.5	550			linear		palmitic acid -d 31
	C18:3n3	alpha- Linolenic acid	2.5	320			linear		palmitic acid -d 31
	C18:3n6	gamma- Linolenic acid	1	140			linear		palmitic acid -d 31
	C20:0	Arachidic acid	2.5	275			linear		palmitic acid -d 31
	C20:1n9	11-Eicosenoic acid	1	150			linear		palmitic acid -d 31
	C20:2n6	11,14-Eicosadienoic acid							
	C20:3n6	homo-gamma- Linolenic acid							
	C20:4n6	Arachidonic acid	1	150			linear		heneicosanoic acid
	C20:5n3	Eicosapentaenoic acid	1	150			linear		heneicosanoic acid
	C22:0	Docosanoic acid	3	320			linear		heneicosanoic acid
	C22:1n9	Docosenoic acid	1.5	175			linear		heneicosanoic acid
	C22:4n6	Docosatetraenoic acid							
	C22:5n3	Docosapentaenoic acid	1	150			linear		heneicosanoic acid
	C22:5n6	Docosapentaenoic acid							
	C22:6n3	Docosahexaenoic acid	1	150			linear		heneicosanoic acid
	C24:0	Lignoceric acid	1	150			linear		heneicosanoic acid
	C24:1n9	Nervonic acid	1	150			linear		heneicosanoic acid
Lab 2	C8:0	Octanoic	12.5	100	0.616	ND	linear	equal	¹³ C ₄ -octanoic
	C10:1	Decenoic	12.5	100	0.193	ND	linear	equal	d ₃ -decanoic
	C10:0	Decanoic	12.5	100	0.193	ND	linear	equal	d ₃ -decanoic
	C12:1	Lauroleic	12.5	100	0.642	ND	linear	equal	d ₃ -lauric
	C12:0	Lauric	12.5	100	0.642	ND	linear	equal	d ₃ -lauric
	C14:2	Tetradecenoic	12.5	100	0.048	ND	linear	equal	d ₃ -pentadecanoic
	C14:1	Myristoleic	12.5	100	0.048	ND	linear	equal	d ₃ -pentadecanoic
	C16:2	Hexadecenoic	12.5	100	0.048	ND	linear	equal	d ₃ -pentadecanoic
	C20:0	Arachidic	125	1000	0.282	ND	linear	equal	d ₃ -arachidic
	C20:3ω9	Mead	6.25	50	0.023	ND	linear	equal	d ₄ -docosanoic
	C20:3ω6	homo-γ-Linoleic	6.25	50	0.023	ND	linear	equal	d ₄ -docosanoic
	C22:5ω3	Docosapentaenoic (ω3)	6.25	50	0.021	ND	linear	equal	d ₄ -docosanoic
	C22:5ω6	Docosapentaenoic (ω6)	6.25	50	0.021	ND	linear	equal	d ₄ -docosanoic

Table A-2 Continued									
Lab	Fatty Acid Code	Fatty Acid Name	Lowest std (μmol/L)	Highest std (μmol/L)	LOD (μmol/L)	LOQ (μmol/L)	Curve Type	Weighting	IS used for quantitation
Lab 2	C22:1ω9	Erucic	6.25	50	0.022	ND	linear	equal	d ₄ -docosanoic
	C22:0	Docosanoic	6.25	50	0.055	ND	linear	equal	d ₄ -docosanoic
	C24:1ω9	Nervonic	6.25	50	0.015	ND	linear	equal	d ₄ -tetracosanoic
	C24:0	Tetracosanoic	6.25	50	0.054	ND	linear	equal	d ₄ -tetracosanoic
	C26:1	Hexacosanoic	1.25	10	0.018	ND	linear	equal	d ₄ -hexacosanoic
	C26:0	Hexacosanoic	1.25	10	0.018	ND	linear	equal	d ₄ -hexacosanoic
	PhA	Phytanic	2.5	20	0.008	ND	linear	equal	d ₃ -phytanic
	PrA	Pristanic	0.25	2.0	0.003	ND	linear	equal	d ₃ -pristanic
	C14:0	Myristic	125	1000	0.783	ND	linear	equal	d ₃ -myristic
	C16:1ω9	7-Hexadecenoic	125	1000	0.057	ND	linear	equal	d ₃ -myristic
	C16:1ω7	Palmitoleic	125	1000	0.057	ND	linear	equal	d ₃ -myristic
	C16:0	Palmitic	250	2000	5.68	ND	linear	equal	d ₃ -palmitic
	C18:2ω6	Linoleic	250	2000	1.13	ND	linear	equal	d ₃ -stearic
	C18:1ω9	Oleic	250	2000	1.419	ND	linear	equal	d ₃ -stearic
	C18:1ω7	Vaccenic	250	2000	1.419	ND	linear	equal	d ₃ -stearic
	C18:0	Stearic	250	2000	8.312	ND	linear	equal	d ₃ -stearic
	C18:3ω6	γ-Linolenic	125	1000	0.042	ND	linear	equal	d ₃ -arachidic
	C18:3ω3	Linolenic	125	1000	0.042	ND	linear	equal	d ₃ -arachidic
	C20:5ω3	Eicosapentaenoic	125	1000	0.241	ND	linear	equal	d ₃ -arachidic
	C20:4ω6	Arachidonic	125	1000	0.13	ND	linear	equal	d ₃ -arachidic
	C22:6ω3	Docosahexaenoic	6.25	50	0.029	ND	linear	equal	d ₄ -docosanoic
	C22:4ω6	Docosatetraenoic	6.25	50	0.13	ND	linear	equal	d ₄ -docosanoic
Lab 3	C14:0	Myristic acid	0.1	2.5			Linear	None	
	C16:0	Palmitic acid	1.6	40			Linear	None	
	C16:1n7t	Palmitelaidic Acid	0.05	1.25			Linear	None	
	C16:1n7	Palmitoleic acid	0.1	2.5			Linear	None	
	C17:0		1	25			Linear	None	
	C18:0	Stearic acid	1.2	30			Linear	None	
	C18:1t		0.1	2.5			Linear	None	
	C18:1n9	Oleic acid	1.1	27.5			Linear	None	
	C18:2n6t	Linoelaidic Acid	0.05	1.25			Linear	None	
	C18:2n6	Linoleic acid	1	25			Linear	None	
	C20:0	Arachidic acid	0.1	2.5			Linear	None	
	C18:3n6	gamma-Linolenic acid	0.05	1.25			Linear	None	
	C20:1n9	11-Eicosenoic acid	0.15	3.75			Linear	None	
	C18:3n3	alpha-Linolenic acid	0.05	1.25			Linear	None	
	C20:2n6	11,14-Eicosadienoic acid	0.15	3.75			Linear	None	
	C22:0	Docosanoic acid	0.1	2.5			Linear	None	

Table A-2 Continued									
Lab	Fatty Acid Code	Fatty Acid Name	Lowest std (μmol/L)	Highest std (μmol/L)	LOD (μmol/L)	LOQ (μmol/L)	Curve Type	Weighting	IS used for quantitation
Lab 3	C20:3n6	homo-gamma-Linolenic acid	0.3	7.5			Linear	None	
	C20:4n6	Arachidonic acid	1.2	30			Linear	None	
	C24:0	Lignoceric acid	0.1	2.5			Linear	None	
	C20:5n3	Eicosapentaenoic acid	0.3	7.5			Linear	None	
	C24:1n9	Nervonic acid	0.1	2.5			Linear	None	
	C22:3n3		25	25			Linear	None	
	C22:4n6	Docosatetraenoic acid	0.2	5			Linear	None	
	C22:5n6	Docosapentaenoic acid	0.1	2.5			Linear	None	
	C22:5n3	Docosapentaenoic acid	0.3	7.5			Linear	None	
	C22:6n3	Docosahexaenoic acid	0.4	10			Linear	None	
	C14:1n5	Myristoleic acid							
	C18:1n7	cis-Vaccenic acid	1.1	27.5			Linear	None	
	C22:1n9	Docosenoic acid							
Lab 4	C14:0	Myristic acid	0.1	2.5			Linear	None	
	C16:0	Palmitic acid	1.6	40			Linear	None	
	C16:1n7t	Palmitelaidic Acid	0.05	1.25			Linear	None	
	C16:1n7	Palmitoleic acid	0.1	2.5			Linear	None	
	C18:0	Stearic acid	1.2	30			Linear	None	
	C18:1t		0.1	2.5			Linear	None	
	C18:1n9	Oleic acid	1.1	27.5			Linear	None	
	C18:2n6t	Linoelaidic Acid	0.05	1.25			Linear	None	
	C18:2n6	Linoleic acid	1	25			Linear	None	
	C20:0	Arachidic acid	0.1	2.5			Linear	None	
	C18:3n6	gamma-Linolenic acid	0.05	1.25			Linear	None	
	C20:1n9	11-Eicosenoic acid	0.15	3.75			Linear	None	
	C18:3n3	alpha-Linolenic acid	0.05	1.25			Linear	None	
	C20:2n6	11,14-Eicosadienoic acid	0.15	3.75			Linear	None	
	C22:0	Docosanoic acid	0.1	2.5			Linear	None	
	C20:3n6	homo-gamma-Linolenic acid	0.3	7.5			Linear	None	
	C20:4n6	Arachidonic acid	1.2	30			Linear	None	
	C24:0	Lignoceric acid	0.1	2.5			Linear	None	
	C20:5n3	Eicosapentaenoic acid	0.3	7.5			Linear	None	
	C24:1n9	Nervonic acid	0.1	2.5			Linear	None	
	C22:3n3		25	25			Linear	None	
	C22:4n6	Docosatetraenoic acid	0.2	5			Linear	None	
	C22:5n6	Docosapentaenoic acid	0.1	2.5			Linear	None	
	C22:5n3	Docosapentaenoic acid	0.3	7.5			Linear	None	
	C22:6n3	Docosahexaenoic acid	0.4	10			Linear	None	

Table A-2 Continued									
Lab	Fatty Acid Code	Fatty Acid Name	Lowest std (μmol/L)	Highest std (μmol/L)	LOD (μmol/L)	LOQ (μmol/L)	Curve Type	Weighting	IS used for quantitation
Lab 5	No information								
Lab 6	C14:0	Myristic	12.60	440.63	1.09		quadratic	1/x	C13:1n1 FAME
	C16:0	Palmitic	233.66	7379.21	35.81		quadratic	1/x	C17:1n7 trans FAME
	C16:1n7	Palmitoleic	23.47	740.53	4.03		quadratic	1/x	C13:1n1 FAME
	C18:0	Stearic	100.11	3503.59	6.97		quadratic	1/x	C17:1n7 trans FAME
	C18:1n9	Oleic	214.02	6758.48	36.77		quadratic	1/x	C17:1n7 trans FAME
	C18:1n7	Vaccenic	21.31	673.38	2.49		quadratic	1/x	C21:0 FAME
	C18:2n6	Linoleic	214.76	6782.35	26.76		quadratic	1/x	C17:1n7 trans FAME
	C18:3n6	gamma-Linolenic	10.34	361.85	0.83		quadratic	1/x	C21:0 FAME
	C18:3n3	alpha-Linolenic	10.24	357.83	1.22		quadratic	1/x	C21:0 FAME
	C20:3n6	Eicosatrienoic	20.03	632.10	2.90		quadratic	1/x	C21:0 FAME
	C20:4n6	Arachidonic	92.68	3243.48	5.07		quadratic	1/x	C17:1n7 trans FAME
	C22:0	Behenic	8.25	288.84	0.66		quadratic	1/x	C21:0 FAME
	C20:5n3	Eicosapentaenoic	9.59	335.07	1.41		quadratic	1/x	C23:1n9 FAME
	C22:4n6	Docosatetraenoic	8.60	300.90	0.70		quadratic	1/x	C23:1n9 FAME
	C24:0	Lignoceric	7.81	272.99	0.55		quadratic	1/x	C23:1n9 FAME
	C22:5n3	Docosapentaenoic	8.62	301.39	0.67		quadratic	1/x	C23:1n9 FAME
	C24:1	Nervonic	7.72	270.62	1.14		quadratic	1/x	C23:1n9 FAME
	C22:6n3	Docosaheptaenoic	18.48	583.11	1.76		quadratic	1/x	C23:1n9 FAME
Lab 7	No information								
Lab 8	C14:0	Myristic	0.66	876.39	1.12	3.39	linear		myristic-d3
	C14:1n5	Myristoleic	0.33	442.11	0.92	2.79	linear		myristoleic-d3
	C16:0	Palmitic	0.88	870.78	2.63	7.97	linear		palmitic-d3
	C16:1n7	Palmitoleic	0.59	393.36	0.84	2.55	linear		palmitoleic-d3
	C18:0	Stearic	1.06	703.56	2.74	8.30	linear		stearic-d3
	C18:1n7	cis-Vaccenic	1.06	598.32	1.36	4.12	linear		cis-vaccenic-d3
	C18:1n9	Oleic	1.07	708.57	1.79	5.42	linear		oleic-d3
	C18:2n6	Linoleic	1.35	356.84	0.97	2.94	linear		linoleic-d3
	C18:3n3	alpha-Linolenic	1.16	412.79	1.02	3.09	linear		alpha-linolenic-d3
	C18:3n6	gamma-Linolenic	1.36	459.43	1.01	3.06	linear		gamma-linolenic-d3
	C20:0	Arachidic	0.97	640.41	2.54	7.70	linear		arachidic-d3
	C20:1n9	11-Eicosenoic	0.81	422.28	2.03	6.15	linear		11-eicosenoic-d3
	C20:2n6	11,14-Eicosadienoic	0.82	424.39	1.03	3.12	linear		11,14-eicosadienoic-d3
	C20:3n6	h-g-Linolenic	0.51	415.94	0.96	2.91	linear		h-g-linolenic-d3
	C20:4n6	Arachidonic	0.83	428.69	1.06	3.21	linear		arachidonic-d3
	C20:5n3	Eicosapentaenoic	0.89	487.37	1.23	3.73	linear		eicosapentaenoic-d3
	C22:0	Docosanoic	1.19	521.24	1.08	3.27	linear		docosanoic-d3
	C22:1n9	Docosenoic	1.25	654.40	1.23	3.73	linear		docosenoic-d3

Table A-2 Continued									
Lab	Fatty Acid Code	Fatty Acid Name	Lowest std (μmol/L)	Highest std (μmol/L)	LOD (μmol/L)	LOQ (μmol/L)	Curve Type	Weighting	IS used for quantitation
Lab 8	C22:4n6	Docosatetraenoic	1.24	459.37	0.5	1.52	linear		docosatetraenoic-d3
	C22:5n3	Docosapentaenoic	1.26	423.37	0.48	1.45	linear		docosapentaenoic-d3
	C22:6n3	Docosahexaenoic	0.77	504.66	0.89	2.70	linear		docosahexaenoic-d3
	C24:0	Lignoceric	1.02	542.93	2.78	8.42	linear		lignoceric -d3
	C24:1n9	Nervonic	1.03	472.96	1.25	3.79	linear		nervonic -d3
Lab 9	C14:0							1.0097	tritridecanoin
	C14:1							1.0012	tritridecanoin
	C15:0							1.0207	tritridecanoin
	C16:0							1.0214	tritridecanoin
	C16:1							1.0337	tritridecanoin
	C18:0							1.0370	tritridecanoin
	C18:1 total							1.0382	tritridecanoin
	C18:2n6							1.0432	tritridecanoin
	C18:3n6							1.0492	tritridecanoin
	C18:3n3							1.0511	tritridecanoin
	C18:4n3								tritridecanoin
	C20:0							1.0129	tritridecanoin
	C20:1 total							1.0159	tritridecanoin
	C20:2n6							1.0266	tritridecanoin
	C20:3n6							1.0222	tritridecanoin
	C20:4n6							1.0521	tritridecanoin
	C20:3n3							1.0121	tritridecanoin
	C20:4n3								tritridecanoin
	C20:5n3							1.0341	tritridecanoin
	C22:0							0.9930	tritridecanoin
	C22:1total							0.9914	tritridecanoin
	C22:2n6							1.0039	tritridecanoin
	C22:4n6							1.0051	tritridecanoin
	C22:5n6							1.0324	tritridecanoin
	C22:5n3							0.9949	tritridecanoin
	C22:6n3							0.9825	tritridecanoin
	C24:0							0.9862	tritridecanoin
	C24:1							0.9740	tritridecanoin
Lab 10	C14:0	Myristic acid	n/a	277	n/a	2.76	one point	n/a	22:3n-3 ethyl ester
	C14:1n5	Myristoleic acid	n/a	277	n/a	n/a	one point	n/a	22:3n-3 ethyl ester
	C16:0	Palmitic acid	n/a	277	n/a	2.76	one point	n/a	22:3n-3 ethyl ester
	C16:1n7	Palmitoleic acid	n/a	277	n/a	2.76	one point	n/a	22:3n-3 ethyl ester
	C18:0	Stearic acid	n/a	277	n/a	2.76	one point	n/a	22:3n-3 ethyl ester

Table A-2 Continued									
Lab	Fatty Acid Code	Fatty Acid Name	Lowest std (μmol/L)	Highest std (μmol/L)	LOD (μmol/L)	LOQ (μmol/L)	Curve Type	Weighting	IS used for quantitation
Lab 10	C18:1n7	<i>cis</i> -Vaccenic acid	n/a	277	n/a	2.76	one point	n/a	22:3n-3 ethyl ester
	C18:1n9	Oleic acid	n/a	277	n/a	2.76	one point	n/a	22:3n-3 ethyl ester
	C18:2n6	Linoleic acid	n/a	277	n/a	2.76	one point	n/a	22:3n-3 ethyl ester
	C18:3n3	<i>alpha</i> -Linolenic acid	n/a	277	n/a	2.76	one point	n/a	22:3n-3 ethyl ester
	C18:3n6	<i>gamma</i> -Linolenic acid	n/a	277	n/a	2.76	one point	n/a	22:3n-3 ethyl ester
	C20:0	Arachidic acid	n/a	277	n/a	2.76	one point	n/a	22:3n-3 ethyl ester
	C20:1n9	11-Eicosenoic acid	n/a	277	n/a	2.76	one point	n/a	22:3n-3 ethyl ester
	C20:2n6	11,14-Eicosadienoic acid	n/a	277	n/a	2.76	one point	n/a	22:3n-3 ethyl ester
	C20:3n6	<i>homo-gamma</i> -Linolenic acid	n/a	277	n/a	2.76	one point	n/a	22:3n-3 ethyl ester
	C20:4n6	Arachidonic acid	n/a	277	n/a	2.76	one point	n/a	22:3n-3 ethyl ester
	C20:5n3	Eicosapentaenoic acid	n/a	277	n/a	2.76	one point	n/a	22:3n-3 ethyl ester
	C22:0	Docosanoic acid	n/a	277	n/a	2.76	one point	n/a	22:3n-3 ethyl ester
	C22:1n9	Docosenoic acid	n/a	277	n/a	2.76	one point	n/a	22:3n-3 ethyl ester
	C22:4n6	Docosatetraenoic acid	n/a	277	n/a	2.76	one point	n/a	22:3n-3 ethyl ester
	C22:5n3	Docosapentaenoic acid	n/a	277	n/a	2.76	one point	n/a	22:3n-3 ethyl ester
	C22:5n6	Docosapentaenoic acid	n/a	277	n/a	n/a	n/a	n/a	22:3n-3 ethyl ester
	C22:6n3	Docosahexaenoic acid	n/a	277	n/a	2.76	one point	n/a	22:3n-3 ethyl ester
	C24:0	Lignoceric acid	n/a	277	n/a	2.76	one point	n/a	22:3n-3 ethyl ester
	C24:1n9	Nervonic acid	n/a	277	n/a	2.76	one point	n/a	22:3n-3 ethyl ester
Lab 11	C8:0	Caprylic (octanoic)	1.06	91.3	n/a	n/a	linear	1/x	Caprylic-d3
	C10:0	Capric (decanoic)	0.51	45.7	n/a	n/a	quadratic	1/x ²	Capric-d3
	C12:0	Lauric (dodecanoic)	1.00	84.0	n/a	n/a	quadratic	1/x ²	Lauric-d3
	C14:0	Myristic	10.8	1075	n/a	n/a	quadratic	1/x ²	Myristic-d27
	C14:1n5	Myristoleic	1.49	149	n/a	n/a	quadratic	1/x ²	Myristic-d27
	C15:0	Pentadecanoic	0.50	54.7	n/a	n/a	linear	1/x ²	Pentadecanoic-d3
	C16:1n7	Palmitoleic	25.3	2530	n/a	n/a	quadratic	1/x ²	Palmitoleic-d14
	C16:0	Palmitic	95.9	9591	n/a	n/a	quadratic	1/x ²	Palmitic-d31
	C17:0	Margaric (heptadecanoic)	2.85	52.2	n/a	n/a	quadratic	1/x	Margaric-d3
	C18:0	Stearic	27.2	2721	n/a	n/a	quadratic	1/x ²	Stearic-d35
	C18:1n9	Oleic	89.5	8949	n/a	n/a	linear	1/x ²	13C-Oleic
	C18:1n7	<i>cis</i> -Vaccenic	7.32	732	n/a	n/a	quadratic	1/x ²	13C-Oleic
	C18:2n6	Linoleic	86.4	8635	n/a	n/a	linear	1/x ²	13C-Linoleic
	C18:3n3	<i>alpha</i> -Linolenic	6.62	662	n/a	n/a	linear	1/x ²	<i>alpha</i> -Linolenic-d14
	C18:3n6	<i>gamma</i> -Linolenic	2.99	299	n/a	n/a	linear	1/x ²	<i>alpha</i> -Linolenic-d14
	C18:4n3	Stearidonic	0.49	50.3	n/a	n/a	quadratic	1/x	Arachidic-d39
	C20:0	Arachidic	0.95	95.1	n/a	n/a	linear	1/x ²	Arachidic-d39
	C20:1n9	11-Eicosenoic	1.02	102	n/a	n/a	quadratic	1/x ²	Arachidic-d39
	C20:2n6	11,14-Eicosadienoic	0.97	96.8	n/a	n/a	quadratic	1/x ²	Arachidic-d39
	C20:3n9	5Z, 8Z, 11Z-Eicosatrienoic	0.91	71.8	n/a	n/a	quadratic	1/x ²	Arachidic-d39
	C20:3n6	<i>homo-gamma</i> -Linolenic	4.63	463	n/a	n/a	quadratic	1/x ²	<i>alpha</i> -Linolenic-d14
	C20:4n6	Arachidonic	23.0	2300	n/a	n/a	linear	1/x ²	Arachidonic-d8
	C20:5n3	Eicosapentaenoic	3.97	397	n/a	n/a	quadratic	1/x ²	Eicosapentaenoic-d5
	C22:0	Docosanoic	1.94	194	n/a	n/a	linear	1/x ²	Docosanoic-d4
	C22:1n9	Docosenoic	0.56	56.1	n/a	n/a	quadratic	1/x	Docosanoic-d4
	C22:2n6	13,16- Docosadienoic	0.50	45.5	n/a	n/a	linear	1/x ²	Docosanoic-d4
	C22:4n6	Docosatetraenoic	1.55	155	n/a	n/a	quadratic	1/x ²	Docosahexaenoic-d5
	C22:5n3	Docosapentaenoic n-3	2.54	254	n/a	n/a	linear	1/x ²	Docosahexaenoic-d5
	C22:5n6	Docosapentaenoic n-6	1.50	150	n/a	n/a	linear	1/x ²	Docosahexaenoic-d5
	C22:6n3	Docosahexaenoic	8.06	806	n/a	n/a	linear	1/x ²	Docosahexaenoic-d5
	C23:0	Tricosanoic	0.83	47.2	n/a	n/a	linear	1/x ²	Docosanoic-d4
	C24:0	Tetracosanoic	1.40	140	n/a	n/a	linear	1/x ²	Tetracosanoic-d4
	C24:1n9	Nervonic	1.99	199	n/a	n/a	quadratic	1/x ²	Tetracosanoic-d4
	C26:0	Hexacosanoic (cerotic)	0.49	41.1	n/a	n/a	linear	1/x ²	Tetracosanoic-d4

Appendix B

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