September 29, 2007

Dear Colleague:

Enclosed is the summary report of the results for the pilot exercise in the Dietary Supplement Quality Assurance (QA) Program. Included in this report are: a summary of data for all laboratories; the measurement comparability summary for evaluating laboratory performance; a summary of individual laboratory performance and interlaboratory accuracy and precision; and a summary of the NIST assigned value (NAV) vs. your laboratory value for the analytes you measured. This summary information is also displayed on a certificate. In this exercise, the NIST assigned values are the certified or reference values for the study materials and the controls, except for Standard Reference Material (SRM) 3278, where values for individual fatty acids will not be assigned in the SRM; in this case, NIST performed a single set of analyses for comparison with the results reported by study participants.

As program organizers, we have learned quite a bit from this study. We are hoping to make arrangements for an informal workshop at which we can discuss what worked and didn't work in this pilot exercise, exchange information on methodology, etc., but have not been able to do so yet. In the meantime, the QA program will be discussed by Kate Rimmer during an NIH ODS session entitled "Complying with GMPs: Tools for a QA Unit" being held at SupplySide West on the afternoon of November 6.

The Dietary Supplement Quality Assurance Program will begin in earnest with the next set of samples, which we expect to distribute in February with results due by the end of April. Prior to distribution of samples, you will be provided with a list of samples and analytes from which to choose, as you were in the pilot exercise. Either Kate Rimmer or Laura Wood will be contacting you in this regard, and Katrice Lippa will hereafter be responsible for data analysis. Dave Duewer and I will continue to be involved with the program, but Kate, Laura, and Katrice will be filling the roles that we filled during the pilot exercise.

We appreciate your participation in this pilot exercise. If you have any questions regarding this report, please contact David Duewer at 301-975-3935 or david.duewer@nist.gov, or me at 301-975-3121 or katherine.sharpless@nist.gov.

Sincerely,

Katherine E. Sharpless, Ph.D.
Research Chemist
Analytical Chemistry Division
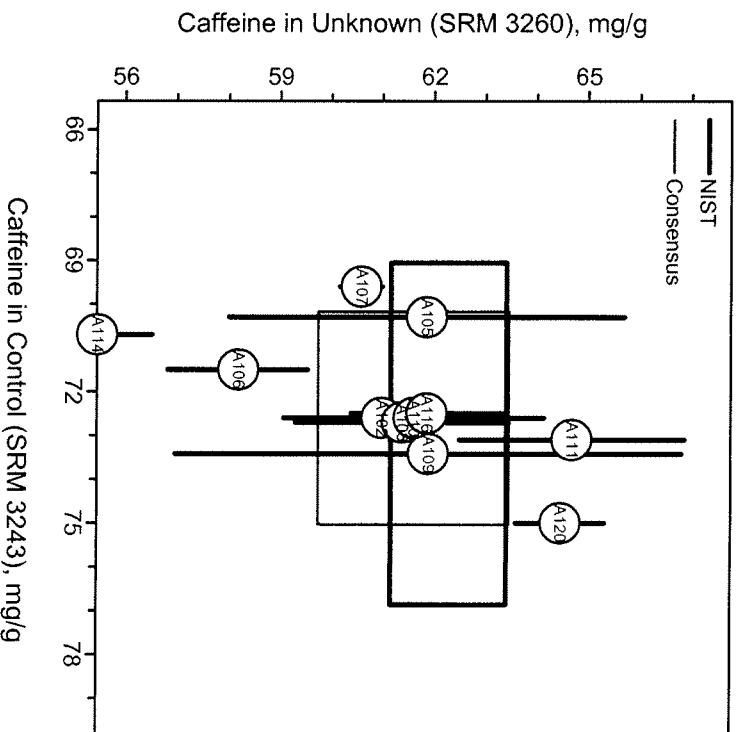Chemical Science and Technology Laboratory

Enclosures

Dietary Supplements Quality Assurance Program
2007 **Exploratory Study**

Col/Row Headers		Meaning
Lab	Participant code	
Control	Name of control material	
Unknown	Name of unknown material	
	A_1	First measurement of first unit of unknown
	A_2	Second measurement of first unit of unknown
	B_1	First measurement of second unit of unknown
	B_2	Second measurement of second unit of unknown
Mean	Mean of each participant's replicate measurements	
	s_{btwn}	Participant's between-unit (sample preparation) standard deviation
	s_{wthn}	Participant's within-unit (instrumental) standard deviation
	s_{total}	Participant's total measurement standard deviation
	N	Number of quantitative measurements reported
Average...	For the Mean values, the mean of the participants' mean values	
		For standard deviations, the pooled value of the participants' standard deviations
Median	Median of the participants' mean values, a robust estimate of the consensus value	
MADe	(Median absolute deviation from the median)/0.674, a robust estimate of among-participant standard deviation	
%RSD	Relative standard deviation expressed as percent, 100*MADe/Median	
NIST	NIST value	
$\pm U_{95}$	Approximate 95% confindence interval on the NIST value	

Dietary Supplements Quality Assurance Program
2007 Exploratory Study

Caffeine, mg/g

Lab	Control SRM 3243	Unknown: SRM 3260 A_1	A_2	B_1	B_2	Mean	s_{btwn}	s_{wthn}	s_{total}
A101	72.6	60.5	61.8	61.3	60.3	60.98	0.	0.82	0.82
A102									
A103									
A104									
A105	70.3	63.1	63.3	60.8	60.2	61.85	1.9	0.32	1.92
A106	71.5	58.3	57.5	57.9	59.	58.18	0.	0.68	0.68
A107	69.6	60.3	60.7	60.7	60.6	60.58	0.	0.21	0.21
A108	72.7	62.2	60.5	62.	60.8	61.38	0.	1.04	1.04
A109	73.42	61.76	61.92	64.38	59.46	61.88	0.	2.46	2.46
A110	72.6	61.1	60.4	62.	62.9	61.60	1.13	0.57	1.27
A111	73.1	63.4	65.5	65.2	64.6	64.68	0.	1.09	1.09
A112									
A114	70.7	53.5	51.	53.6	54.7	53.20	0.93	1.37	1.65
A115									
A116	72.5	61.6	61.1	62.4	62.3	61.85	0.68	0.25	0.73
A117									
A118									
A120	75.	64.9	64.2	64.1	64.6	64.45	0.	0.43	0.43
N	11					11			
Mean	72.18					60.96	0.75	1.05	1.29
Median	72.60					61.60	0.93		
MADe	1.22					0.93			
%RSD	1.7					1.5			
NIST	73.0					62.3			
$\pm U_{95}$	3.9					1.1			

Caffeine in Unknown (SRM 3260), mg/g

Legend: ── NIST ── Consensus

Caffeine in Control (SRM 3243), mg/g

Precision bars (thick black) span ±2×s_{total} about Lab mean values.
NIST box (red) encloses ±U_{95} region around NIST values.
Consensus box (blue) encloses ±2×MADe around consensus medians.
Plot box (black) encloses ±10 % around consensus medians.

Dietary Supplements Quality Assurance Program
2007 Exploratory Study

Lead, ng/g

Lab	Control SRM 3243	Unknown: SRM 3248 A_1	A_2	B_1	B_2	Mean	s_{bwn}	s_{wthn}	s_{total}
A101									
A102	626.	781.	818.	799.	824.	805.5	0.	22.3	22.3
A103									
A104									
A105									
A106									
A107	727.	813.	733.	795.	710.	762.8	0.	58.4	58.4
A108									
A109									
A110									
A111									
A112		615.	635.	645.	631.	631.5	3.16	12.2	12.6
A114	614.	744.3	746.8	729.7	766.8	746.9	0.	18.6	18.6
A115	657.6								
A116									
A117									
A118									
A120									
N	4					4			
Average	656.15					736.7	1.6	33.2	33.2
Median	641.80					754.8		43.4	
MADe	32.32					43.4			
%RSD	5.0					5.8			
NIST	660.0					738.2			
$\pm U_{95}$	53.4					8.5			

Lead in Unknown (SRM 3248), ng/g
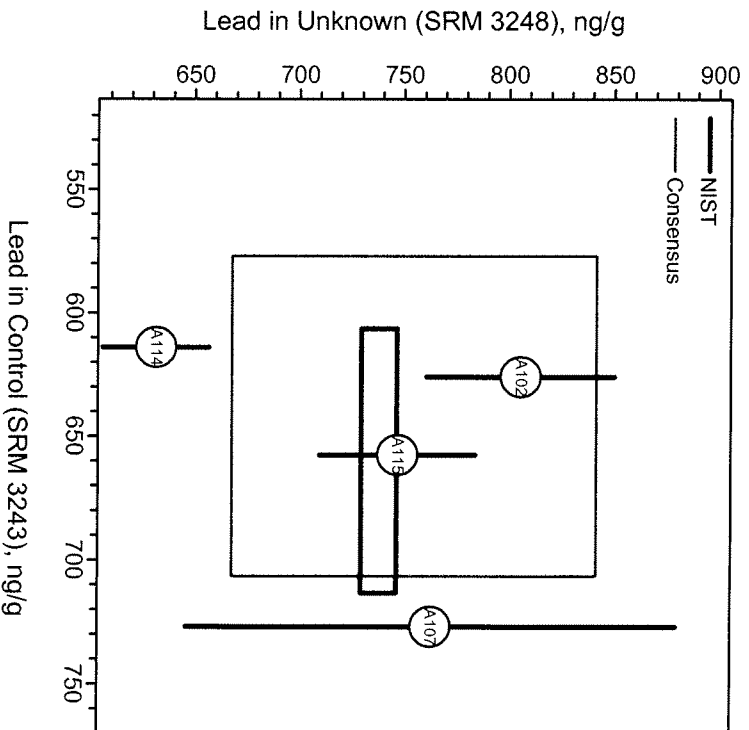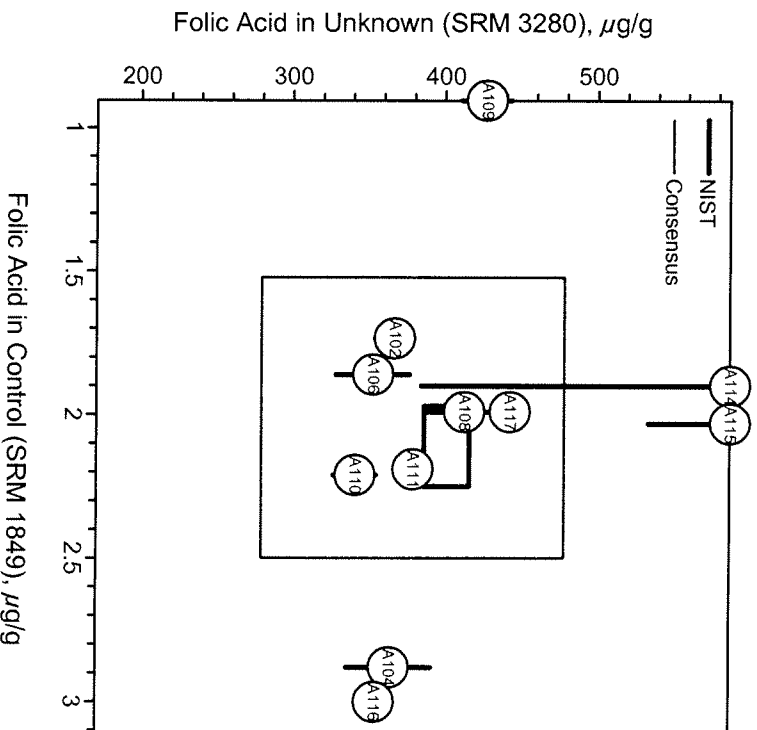

— NIST
— Consensus

Lead in Control (SRM 3243), ng/g

Precision bars (thick black) span $\pm 2 \times s_{total}$ about Lab mean values.
NIST box (red) encloses $\pm U_{95}$ region around NIST values.
Consensus box (blue) encloses $\pm 2 \times$ MADe around consensus medians.
Plot box (black) encloses ± 20 % around consensus medians.

Dietary Supplements Quality Assurance Program
2007 Exploratory Study

Folic Acid, µg/g

Lab	Control SRM 1849	Unknown: SRM 3280							
		A_1	A_2	B_1	B_2	Mean	s_{btwn}	s_{wthn}	s_{total}
A101									
A102	1.73	363.7	365.8	362.8	375.2	366.9	0.	6.3	6.3
A103									
A104	2.88	347.	372.	362.	374.	363.8	0.	13.9	13.9
A105									
A106	1.86	363.	339.	353.	356.	352.8	0.	12.1	12.1
A107									
A108	1.99	398.	417.	410.	425.	412.5	0.	12.1	12.1
A109	na	419.	430.	423.	435.	426.8	0.	8.1	8.1
A110	2.21	331.	345.	343.	345.	341.0	0.	7.1	7.1
A111	2.19	377.	384.	373.	382.	379.0	0.	5.7	5.7
A112									
A114	1.9	710.	540.	900.	820.	742.5	152.3	93.9	179.0
A115	2.03	626.	622.	593.	564.	601.3	30.5	14.6	33.8
A116	3.	353.	353.	360.	350.	354.0	0.	5.0	5.0
A117	1.99	440.	440.	440.	450.	442.5	0.	5.0	5.0
A118									
A120									
N	10					11			
Average	2.18					434.8	46.8	29.8	55.5
Median	2.01					379.0			
MADe	0.24					49.7			
%RSD	12.2					13.1			
NIST	2.11					401.4			
$\pm U_{95}$	0.14					14.8			

Folic Acid in Unknown (SRM 3280), µg/g

Folic Acid in Control (SRM 1849), µg/g

Precision bars (thick black) span $\pm 2 \times s_{total}$ about Lab mean values.
NIST box (red) encloses $\pm U_{95}$ region around NIST values.
Consensus box (blue) encloses $\pm 2 \times$MADe around consensus medians.
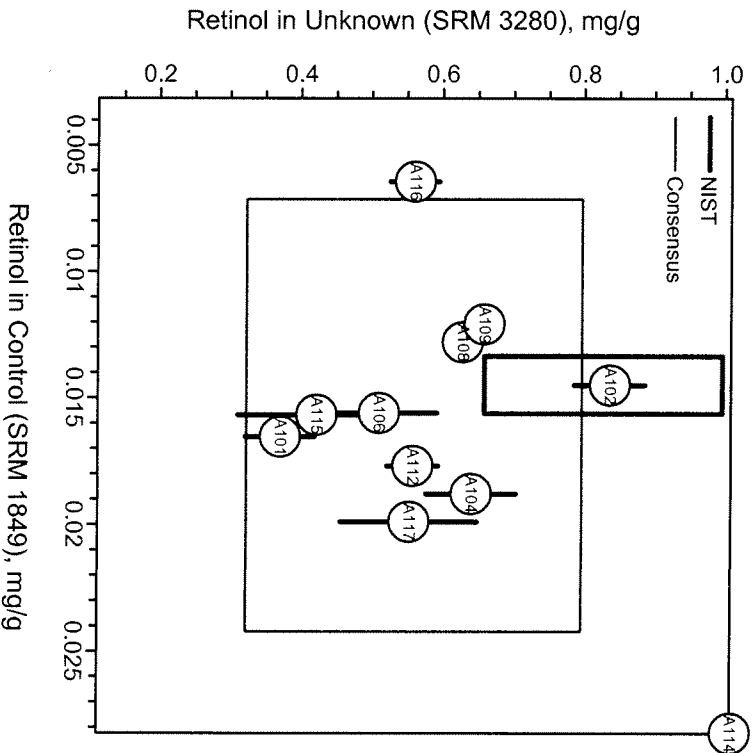Plot box (black) encloses ± 55 % around consensus medians.

Dietary Supplements Quality Assurance Program
2007 Exploratory Study

Retinol, mg/g

Lab	Control SRM 1849	Unknown: SRM 3280							
		A_1	A_2	B_1	B_2	Mean	s_{btwn}	s_{wthn}	s_{total}
A101	0.0165	0.394	0.379	0.344	0.365	0.37	0.021	0.013	0.025
A102	0.0145	0.815	0.825	0.841	0.865	0.836	0.021	0.013	0.025
A103									
A104	0.0188	0.599	0.658	0.64	0.664	0.64	0.	0.032	0.032
A105									
A106	0.0156	0.55	0.52	0.51	0.46	0.51	0.029	0.029	0.041
A107									
A108	0.0128	0.641	0.625	NA	0.623	0.628	0.	0.011	0.011
A109	0.0121	0.659	0.653	0.652	0.67	0.659	0.	0.009	0.009
A110									
A111									
A112	0.0177	0.57	0.534	0.565	0.562	0.558	0.	0.018	0.018
A114	0.114	1.2	1.18	1.22	1.32	1.23	0.044	0.051	0.067
A115	0.0157	0.4	0.479	0.443	0.365	0.422	0.	0.056	0.056
A116	0.0064	0.549	0.547	0.573	0.572	0.56	0.017	0.001	0.017
A117	0.0199	0.5	0.54	0.59	0.58	0.553	0.044	0.021	0.048
A118									
A120									
N	11					11			
Average	0.0240					0.633	0.023	0.028	0.037
Median	0.0157					0.560			
MADe	0.0043					0.119			
%RSD	27.2					21.2			
NIST	0.0145					0.828			
$\pm U_{95}$	0.0011					0.169			

Retinol in Unknown (SRM 3280), mg/g — 0.2, 0.4, 0.6, 0.8, 1.0

Retinol in Control (SRM 1849), mg/g — 0.005, 0.01, 0.015, 0.02, 0.025

Legend: NIST, Consensus

Plotted labels: A116, A109, A108, A102, A115, A106, A101, A112, A104, A117, A114
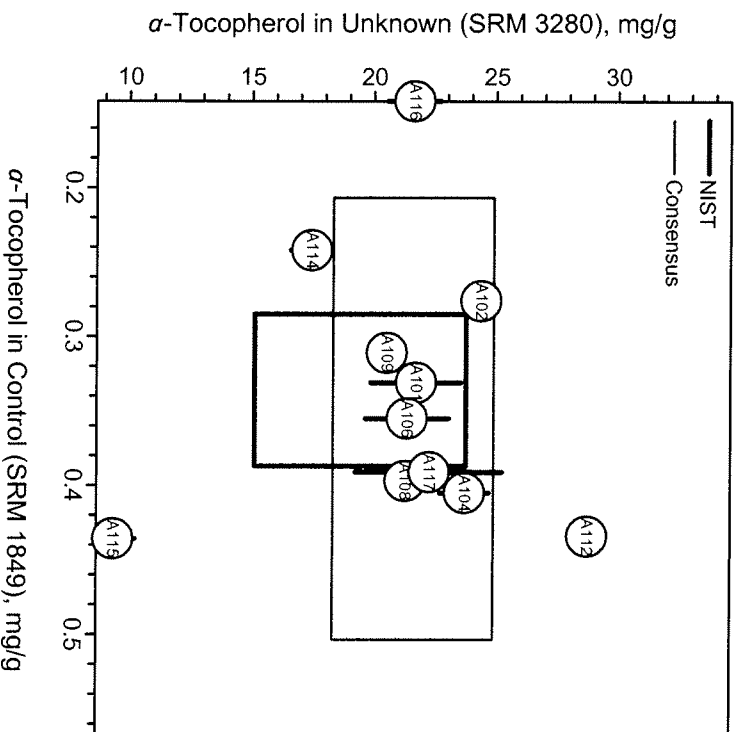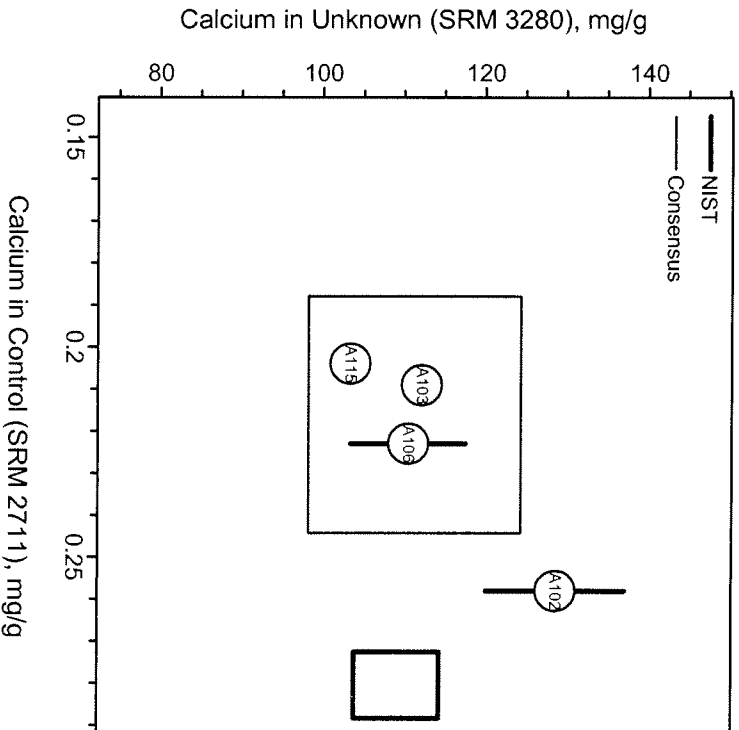
Precision bars (thick black) span $\pm 2 \times s_{total}$ about Lab mean values.

NIST box (red) encloses $\pm U_{95}$ region around NIST values.

Consensus box (blue) encloses $\pm 2 \times$MADe around consensus medians.

Plot box (black) encloses ±80 % around consensus medians.

Dietary Supplements Quality Assurance Program
2007 Exploratory Study

α-Tocopherol, mg/g

Lab	Control SRM 1849	Unknown: SRM 3280							
		A_1	A_2	B_1	B_2	Mean	s_{btwn}	s_{wthn}	s_{total}
A101	0.331	22.51	22.2	20.86	21.3	21.72	0.88	0.27	0.92
A102	0.276	24.1	24.7	24.1	24.6	24.38	0.	0.39	0.39
A103									
A104	0.405	23.4	24.2	23.9	23.3	23.70	0.	0.50	0.50
A105									
A106	0.355	22.	20.9	21.9	20.6	21.35	0.	0.85	0.85
A107									
A108	0.397	21.	21.1	21.4	21.6	21.28	0.31	0.11	0.33
A109	0.311	20.32	20.44	20.75	20.56	20.52	0.18	0.11	0.21
A110									
A111									
A112	0.434	28.58	28.83	28.99	28.5	28.73	0.	0.28	0.28
A114	0.242	17.	17.4	18.	17.3	17.43	0.14	0.40	0.43
A115	0.436	9.97	9.16	9.09	9.05	9.32	0.2	0.41	0.45
A116	0.104	22.	22.	21.4	21.1	21.63	0.52	0.15	0.54
A117	0.391	20.	23.	23.	23.	22.25	0.	1.50	1.50
A118									
A120									
N	11					11			
Average	0.335					21.12	0.33	0.60	0.68
Median	0.355					21.63			
MADe	0.074					1.64			
%RSD	20.9					7.6			
NIST	0.336					19.5			
±U_{95}	0.051					4.3			

α-Tocopherol in Unknown (SRM 3280), mg/g

— NIST
— Consensus

10 15 20 25 30

0.2   0.3   0.4   0.5

α-Tocopherol in Control (SRM 1849), mg/g

(Plotted lab markers: A116, A114, A102, A109, A101, A106, A111, A108, A104, A115, A112)

Precision bars (thick black) span ±2×s_{total} about Lab mean values.

NIST box (red) encloses ±U_{95} region around NIST values.

Consensus box (blue) encloses ±2×MADe around consensus medians.

Plot box (black) encloses ±60 % around consensus medians.

Dietary Supplements Quality Assurance Program
2007 Exploratory Study
Calcium, mg/g

Lab	Control SRM 2711	Unknown: SRM 3280							
		A_1	A_2	B_1	B_2	Mean	s_{btwn}	s_{wthn}	s_{total}
A101									
A102	0.258	124.5	132.4	130.4	127.3	128.65	0.	4.24	4.24
A103	0.209	112.3	113.	111.7	111.7	112.18	0.62	0.35	0.72
A104									
A105									
A106	0.223	109.	114.	107.	112.	110.50	0.	3.54	3.54
A107									
A108									
A109									
A110									
A111									
A112									
A114									
A115	0.204	103.5	103.1	103.2	103.7	103.37	0.	0.30	0.30
A116									
A117									
A118									
A120									
N	4					4			
Average	0.224					113.67	0.31	2.77	2.79
Median	0.216					111.34			
MADe	0.014					6.53			
%RSD	6.5					5.9			
NIST	0.280					109.2			
$\pm U_{95}$	0.008					5.2			

Calcium in Unknown (SRM 3280), mg/g

Calcium in Control (SRM 2711), mg/g

— NIST
— Consensus
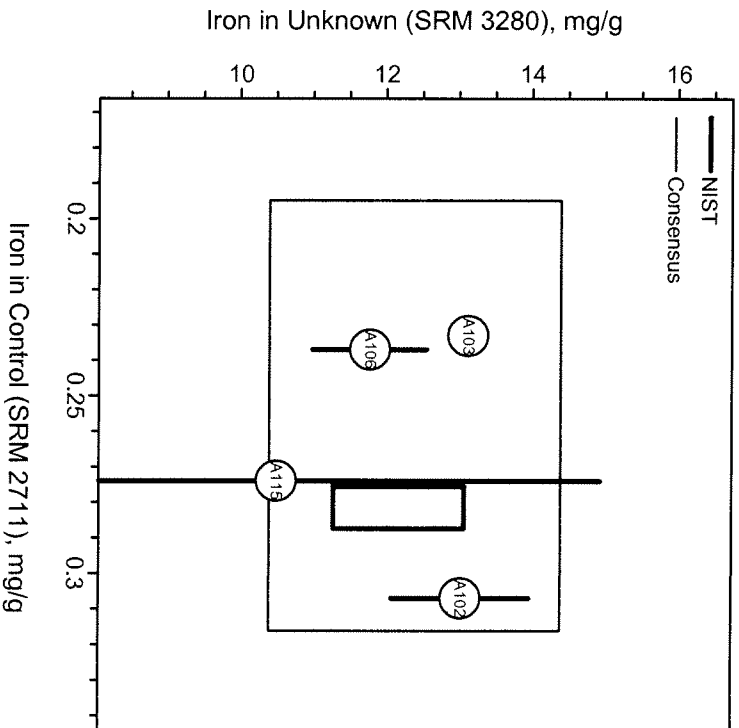
Precision bars (thick black) span $\pm 2 \times s_{total}$ about Lab mean values.
NIST box (red) encloses $\pm U_{95}$ region around NIST values.
Consensus box (blue) encloses $\pm 2 \times$ MADe around consensus medians.
Plot box (black) encloses ± 35 % around consensus medians.

Dietary Supplements Quality Assurance Program
2007 Exploratory Study

Iron, mg/g

Lab	Control SRM 2711	Unknown: SRM 3280							
		A_1	A_2	B_1	B_2	Mean	s_{btwn}	s_{wthn}	s_{total}
A101									
A102	0.307	12.5	13.3	13.4	12.9	13.03	0.	0.47	0.47
A103	0.233	13.07	13.1	13.1	13.22	13.12	0.03	0.06	0.07
A104									
A105									
A106	0.237	11.6	12.1	11.4	12.	11.78	0.	0.39	0.39
A107									
A108									
A109									
A110									
A111									
A112									
A114									
A115	0.274	8.39	12.22	9.55	11.8	10.49	0.	2.22	2.22
A116									
A117									
A118									
A120									
N	4					4			
Average	0.263					12.10	0.01	1.15	1.15
Median	0.256					12.40	1.00		
MADe	0.030					1.00			
%RSD	11.9					8.1			
NIST	0.281					12.2			
$\pm U_{95}$	0.006					0.9			

Iron in Unknown (SRM 3280), mg/g
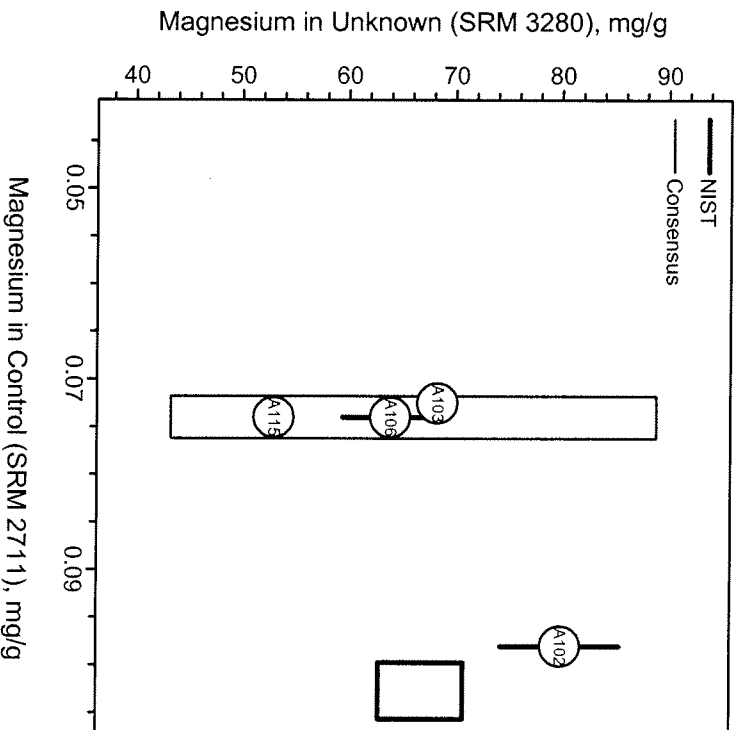
— NIST
— Consensus

Iron in Control (SRM 2711), mg/g

Precision bars (thick black) span $\pm 2 \times s_{total}$ about Lab mean values.

NIST box (red) encloses $\pm U_{95}$ region around NIST values.

Consensus box (blue) encloses $\pm 2 \times$ MADe around consensus medians.

Plot box (black) encloses ±35 % around consensus medians.

Dietary Supplements Quality Assurance Program
2007 Exploratory Study

Magnesium, mg/g

Lab	Control SRM 2711	Unknown: SRM 3280							
		A_1	A_2	B_1	B_2	Mean	s_{btwn}	s_{wthn}	s_{total}
A101									
A102	0.098	77.8	82.7	80.8	78.2	79.88	0.	2.77	2.77
A103	0.073	68.38	67.38	68.36	69.03	68.29	0.39	0.60	0.72
A104									
A105									
A106	0.074	62.3	64.9	62.4	66.	63.90	0.	2.22	2.22
A107									
A108									
A109									
A110									
A111									
A112									
A114									
A115	0.074	53.05	52.91	52.75	53.05	52.94	0.	0.17	0.17
A116									
A117									
A118									
A120									
N	4					4			
Average	0.080					66.25	0.19	1.80	1.81
Median	0.074					66.09			
MADe	0.001					11.38			
%RSD	1.5					17.2			
NIST	0.103					66.9			
$\pm U_{95}$	0.003					3.9			

Magnesium in Unknown (SRM 3280), mg/g

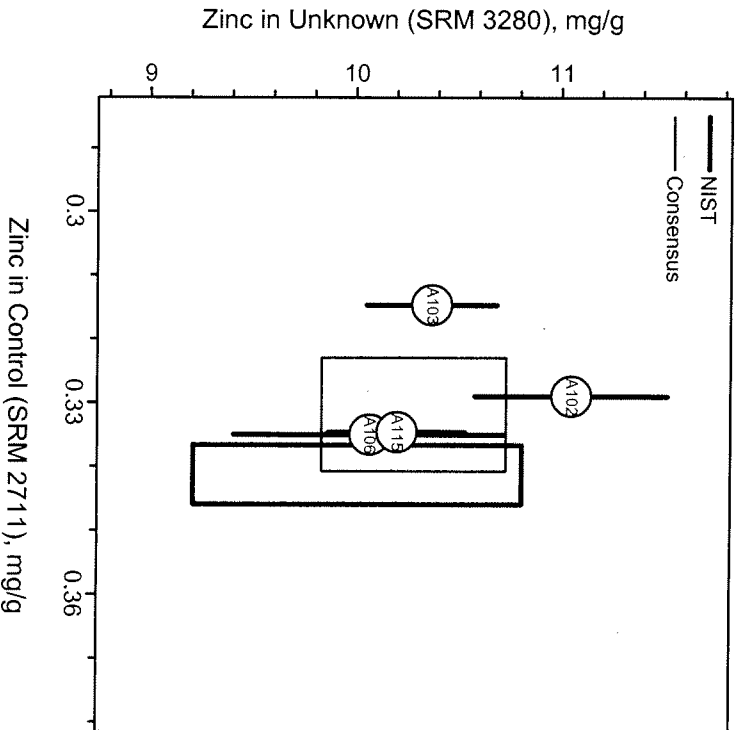Magnesium in Control (SRM 2711), mg/g

— NIST
— Consensus

Precision bars (thick black) span $\pm 2 \times s_{total}$ about Lab mean values.
NIST box (red) encloses $\pm U_{95}$ region around NIST values.
Consensus box (blue) encloses $\pm 2 \times$MADe around consensus medians.
Plot box (black) encloses ± 45 % around consensus medians.

Dietary Supplements Quality Assurance Program
2007 Exploratory Study

Zinc, mg/g

Lab	Control SRM 2711	Unknown: SRM 3280							
		A_1	A_2	B_1	B_2	Mean	s_{btwn}	s_{wthn}	s_{total}
A101									
A102	0.329	10.8	11.	11.1	11.3	11.05	0.19	0.14	0.23
A103	0.315	10.43	10.25	10.53	10.27	10.37	0.	0.16	0.16
A104									
A105									
A106	0.335	9.87	10.3	9.8	10.3	10.07	0.	0.33	0.33
A107									
A108									
A109									
A110									
A111									
A112									
A114									
A115	0.335	10.16	10.02	10.35	10.27	10.20	0.14	0.08	0.17
A116									
A117									
A118									
A120									
N	4					4			
Average	0.328					10.42	0.12	0.20	0.23
Median	0.332					10.29			
MADe	0.004					0.22			
%RSD	1.3					2.2			
NIST	0.341					10.0			
$\pm U_{95}$	0.005					0.8			

Precision bars (thick black) span $\pm 2 \times s_{total}$ about Lab mean values.
NIST box (red) encloses $\pm U_{95}$ region around NIST values.
Consensus box (blue) encloses $\pm 2 \times$MADe around consensus medians.
Plot box (black) encloses ± 15 % around consensus medians.

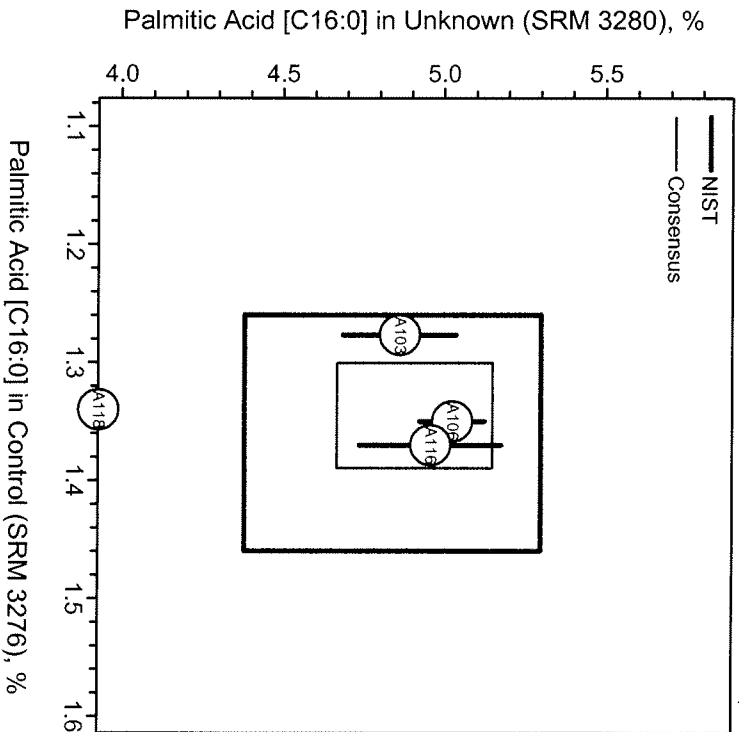Dietary Suppliments Quality Assurance Program
2007 Exploratory Study

Fatty Acids in Unknown (SRM 3280), %

S278

Analyte	NIST		A103		A106		A116		A118		N	Median	MADe	%RSD
	Mean	S_{total}	Mean	S_{total}	Mean	S_{total}	Mean	S_{total}	Mean	S_{total}				
Palmitic Acid [C16:0]	4.84	0.12	4.86	0.09	5.03	0.05	4.96	0.11	2.84	0.18	4	4.91	0.12	2.5
Palmitoleic Acid [C16:1]	0.1753	0.0045	0.1283	0.0048	<0.1		0.2108	0.0119	0.0776	0.0101	3	0.128	0.075	58.6
Margaric Acid [C17:0]	0.0347	0.0030	0.0409	0.0020					0.0190	0.0025	2	0.030	0.016	54.3
Stearic Acid [C18:0]	3.395	0.061	3.208	0.059	3.300	0.000	3.263	0.067			3	3.263	0.056	1.7
Oleic Acid [C18:1]	56.34	0.83	51.53	1.01	55.48	0.27	51.45	0.99			3	51.53	0.11	0.2
Vaccenic Acid [C18:1]	1.304	0.046	2.273	0.119			1.030	0.022			2	1.65	0.92	55.8
Linoleic Acid [C18:2]	31.57	0.66	27.55	0.68	28.63	0.13	26.43	0.53			3	27.6	1.6	5.8
Linolenic Acid [C18:3]	1.789	0.068	1.735	0.029	1.725	0.050	1.763	0.046	2.105	0.021	4	1.749	0.028	1.6
Arachidic Acid [C20:0]	0.430	0.014	0.395	0.013	0.325	0.050	0.438	0.014	0.187	0.021	4	0.360	0.084	23.2
Gondoic Acid [C20:1]	Coelutes		0.439	0.008	0.300	0.050	0.350	0.012	0.254	0.032	4	0.325	0.072	22.1
Behenic Acid [C22:0]	<0.01				0.700	0.000	0.692	0.018			2	0.696	0.006	0.8
Sum Reported Fatty Acids	101.7	0.4	94.2	0.4	96.0	0.1	92.4	0.4	5.7	0.1				

Dietary Supplements Quality Assurance Program
2007 Exploratory Study
Palmitic Acid [C16:0], %

Lab	Control SRM 3276	Unknown: SRM 3280 A_1	A_2	B_1	B_2	Mean	s_{btwn}	s_{wthn}	s_{total}
A101									
A102									
A103	1.277	4.81	4.79	4.9	4.94	4.86	0.09	0.02	0.09
A104									
A105		5.1	5.	5.	5.	5.03	0.	0.05	0.05
A106	1.35								
A107									
A108									
A109									
A110									
A111									
A112									
A114									
A115									
A116	1.37	4.87	5.02	4.89	5.05	4.96	0.	0.11	0.11
A117									
A118	1.34	2.71	2.96	na	na	2.84		0.18	0.18
A120									
N	4					4			
Average	1.334					4.42	0.05	0.11	0.12
Median	1.345					4.91			
MADe	0.022					0.12			
%RSD	1.7					2.5			
NIST	1.36					4.84			
$\pm U_{95}$	0.10					0.46			

Palmitic Acid [C16:0] in Unknown (SRM 3280), %

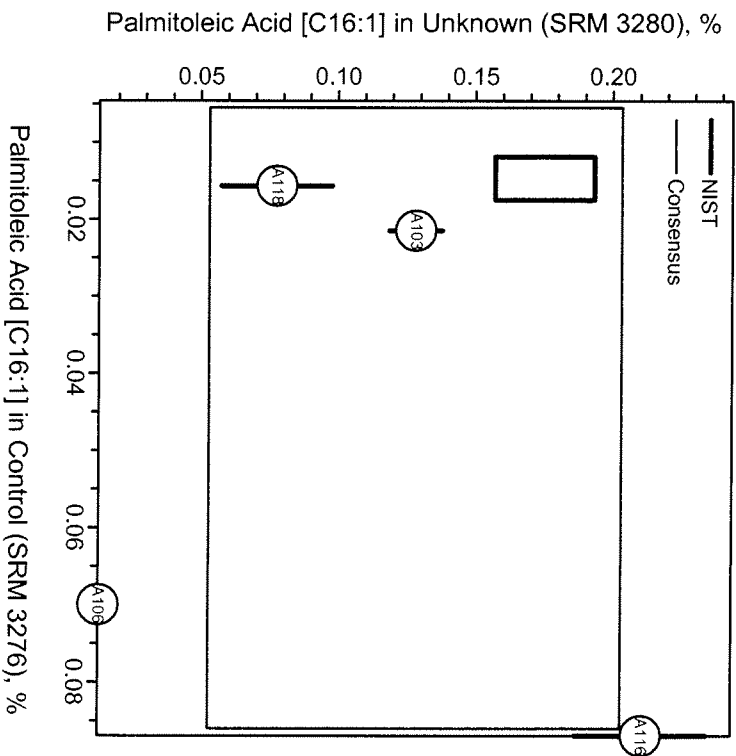— NIST
— Consensus

Palmitic Acid [C16:0] in Control (SRM 3276), %
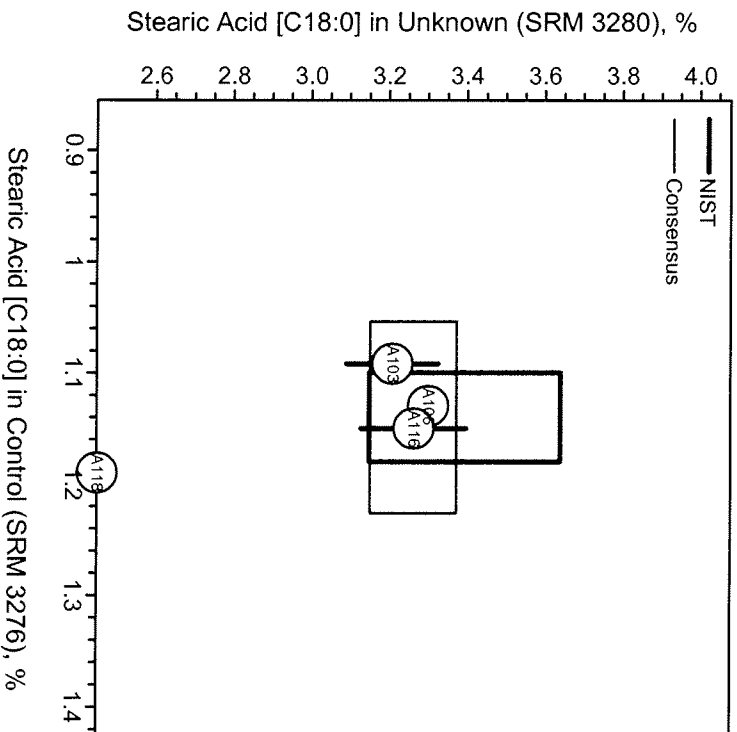
Precision bars (thick black) span $\pm 2 \times s_{total}$ about Lab mean values.
NIST box (red) encloses $\pm U_{95}$ region around NIST values.
Consensus box (blue) encloses $\pm 2 \times$ MADe around consensus medians.
Plot box (black) encloses ± 20 % around consensus medians.

Dietary Supplements Quality Assurance Program
2007 Exploratory Study
Palmitoleic Acid [C16:1], %

Lab	Control SRM 3276	Unknown: SRM 3280 A₁	A₂	B₁	B₂	Mean	s btwn	s wthn	s total
A101									
A102									
A103	0.022	0.126	0.125	0.135	0.127	0.128	0.	0.004	0.005
A104									
A105									
A106	0.07	<0.1	<0.1	<0.1	<0.1	<0.1			
A107									
A108									
A109									
A110									
A111									
A112									
A114									
A115									
A116	0.098	0.205	0.218	0.2	0.22	0.211	0.	0.012	0.012
A117									
A118	0.016	0.085	0.07	na	na	0.078		0.010	0.010
A120									
N	4					3			
Average	0.051					0.139	0.002	0.009	0.009
Median	0.046					0.128		0.075	
MADe	0.040					0.075			
%RSD	88.0					58.6			
NIST	0.01					0.175			
±U₉₅	0.00					0.018			

Palmitoleic Acid [C16:1] in Unknown (SRM 3280), %

Palmitoleic Acid [C16:1] in Control (SRM 3276), %

— NIST
— Consensus

Precision bars (thick black) span ±2×s total about Lab mean values.
NIST box (red) encloses ±U_{95} region around NIST values.
Consensus box (blue) encloses ±MADe around consensus medians.
Plot box (black) encloses ±90 % around consensus medians.

Lab	Control SRM 3276	Unknown: SRM 3280							
		A_1	A_2	B_1	B_2	Mean	s_{btwn}	s_{wthn}	s_{total}
A101									
A102									
A103	1.092	3.149	3.196	3.21	3.279	3.208	0.04	0.042	0.059
A104									
A105		3.3	3.3	3.3	3.3				
A106	1.13	3.3	3.3	3.3	3.3	3.300	0.	0.000	0.000
A107									
A108									
A109									
A110									
A111									
A112									
A114									
A115	1.15	3.21	3.3	3.22	3.32	3.263	0.	0.067	0.067
A116									
A117									
A118	1.19	na	na	na	na				
A120									
N	4					3			
Median	1.140					3.263			
MADe	0.043					0.056			
%RSD	3.8					1.7			
Average	1.141					3.257	0.024	0.046	0.052
NIST	1.140					3.40			
$\pm U_{95}$	0.040					0.24			

Stearic Acid [C18:0] in Unknown (SRM 3280), %

2.6 2.8 3.0 3.2 3.4 3.6 3.8 4.0

— NIST
— Consensus

Stearic Acid [C18:0] in Control (SRM 3276), %

0.9   1   1.1   1.2   1.3   1.4

A103   A105   A116   A118
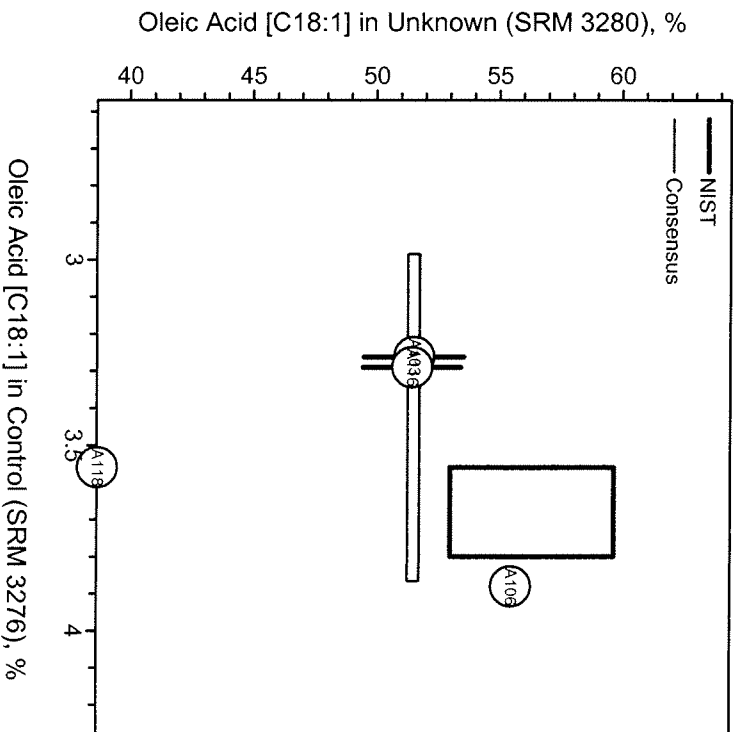
Precision bars (thick black) span ±2×s_{total} about Lab mean values.
NIST box (red) encloses ±U_{95} region around NIST values.
Consensus box (blue) encloses ±2×MADe around consensus medians.
Plot box (black) encloses ±25 % around consensus medians.

Dietary Supplements Quality Assurance Program
2007 Exploratory Study
Oleic Acid [C18:1], %

Lab	Control SRM 3276	Unknown: SRM 3280							
		A_1	A_2	B_1	B_2	Mean	s_{btwn}	s_{wthn}	s_{total}
A101									
A102									
A103	3.263	50.59	51.15	51.72	52.66	51.53	0.85	0.54	1.01
A104									
A105									
A106	3.88	55.8	55.5	55.3	55.3	55.48	0.22	0.15	0.27
A107									
A108									
A109									
A110									
A111									
A112									
A114									
A115									
A116	3.29	50.5	51.8	51.	52.5	51.45	0.	0.99	0.99
A117									
A118	3.56	na	na	na	na				
A120									
N	4					3			
Average	3.498					52.82	0.51	0.66	0.83
Median	3.425					51.53			
MADe	0.221					0.11			
%RSD	6.4					0.2			
NIST	3.680					56.3			
$\pm U_{95}$	0.120					3.3			

Oleic Acid [C18:1] in Unknown (SRM 3280), %

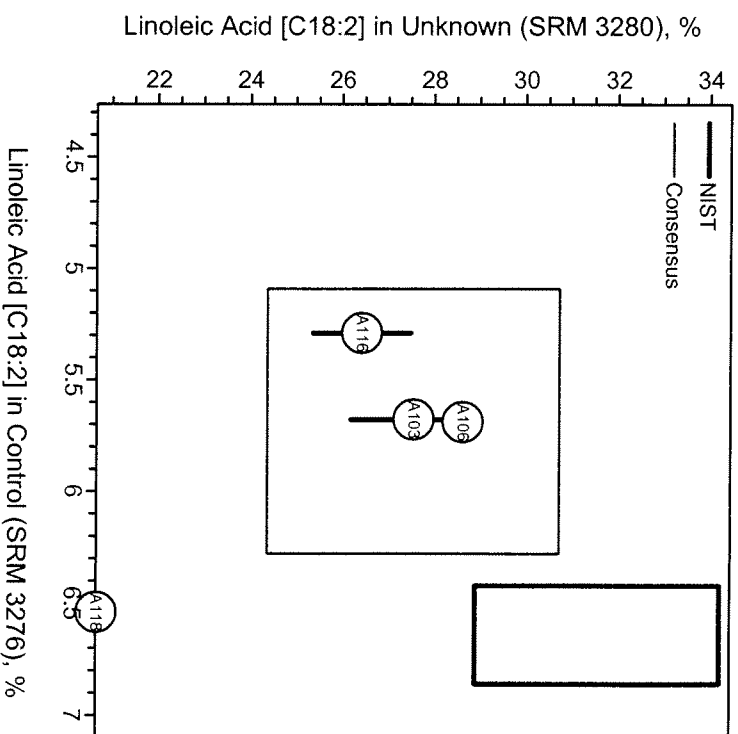Oleic Acid [C18:1] in Control (SRM 3276), %

NIST
Consensus

Precision bars (thick black) span $\pm 2 \times s_{total}$ about Lab mean values.
NIST box (red) encloses $\pm U_{95}$ region around NIST values.
Consensus box (blue) encloses $\pm 2 \times$ MADe around consensus medians.
Plot box (black) encloses ±25 % around consensus medians.

Dietary Supplements Quality Assurance Program
2007 Exploratory Study
Linoleic Acid [C18:2], %

Lab	Control SRM 3276	Unknown: SRM 3280 A_1	A_2	B_1	B_2	Mean	s_{btwn}	s_{wthn}	s_{total}
A101									
A102									
A103	5.677	27.	27.15	27.89	28.17	27.55	0.66	0.16	0.68
A104									
A105									
A106	5.69	28.8	28.6	28.5	28.6	28.63	0.07	0.11	0.13
A107									
A108									
A109									
A110									
A111									
A112									
A114									
A115									
A116	5.29	25.9	26.6	26.2	27.	26.43	0.	0.53	0.53
A117		na	na	na	na				
A118	6.54	na	na	na	na				
A120									
N	4					3			
Average	5.799					27.53	0.39	0.33	0.51
Median	5.684					27.55			
MADe	0.297					1.59			
%RSD	5.2					5.8			
NIST	6.640					31.6			
±U_{95}	0.220					2.6			

Linoleic Acid [C18:2] in Unknown (SRM 3280), %

Linoleic Acid [C18:2] in Control (SRM 3276), %

Legend: NIST — Consensus

Precision bars (thick black) span ±2×s_{total} about Lab mean values.
NIST box (red) encloses ±U_{95} region around NIST values.
Consensus box (blue) encloses ±2×MADe around consensus medians.
Plot box (black) encloses ±25 % around consensus medians.