
Wadsworth Center

New York State Department of Health

BLOOD LEAD

Proficiency Test Report

Event #1, 2011

February 16, 2011



STATE OF NEW YORK DEPARTMENT OF HEALTH

Wadsworth Center The Governor Nelson A. Rockefeller Empire State Plaza P.O. Box 509 Albany, New York 12201-0509

Nirav R. Shah, M.D., M.P.H.
Commissioner

February 16, 2011

TOXICOLOGY – Blood Lead Event #1, 2011

Dear Laboratory Director:

A statistical summary report for all proficiency test (PT) results evaluated in the first blood lead event of 2011 is enclosed. A confidential three-digit code number assigned by the PT program identifies participating laboratories. Each laboratory will receive an individual performance summary for the last three PT test events under separate cover. To pass the PT for Blood Lead, a laboratory must achieve a minimum score of 80% (4 out of 5 correct) on two consecutive testing events, or two out of three consecutive testing events. Summary reports for Trace Elements in Whole Blood (other than Blood Lead) will be distributed shortly.

PT Materials

The blood-based test materials were obtained from lead-dosed goats prior to the test. On Tuesday, January 11th, 2011, 400-500 mL of blood were drawn from each animal into a blood bag containing 750 mg K₂EDTA. The animals provided pools with lead concentrations ranging from 8 µg/dL to 40 µg/dL. Aliquots of whole blood were transferred into cryovials, and shipped to participating laboratories Wednesday, January 12th, 2011. PT samples for laboratories using the LeadCare[®] system were shipped by overnight express for delivery Wednesday, January 12th, 2011. Target values were established by a ≥90% consensus of 21 measurements performed by 19 reference laboratories using ICP-MS, ETAAS and ASV methods.

Certification for CLIA '88 and OSHA Purposes

Laboratories outside of New York State can have their PT results from this program evaluated for federal regulatory purposes under CLIA '88. The laboratory director should notify the regional CMS office, and should provide our program with the address to which PT results should be sent. Participation in this program may also be used to obtain approval for blood lead testing from the Occupational Safety and Health Administration (OSHA), U.S. Dept. of Labor. For further information on OSHA approval, contact: James S. Pike at 801-233-4927.

Scheduled PT Events

Samples are scheduled to be mailed Wednesday, April 27th, 2011. The laboratory is required to notify the section (trel@wadsworth.org) within five days of shipment that samples have not arrived or are unacceptable for testing. For laboratories using the LeadCare[®] system samples are scheduled to be mailed Tuesday, April 26th, 2011, for delivery Wednesday, April 27th, 2011. These laboratories are required to notify the section (trel@wadsworth.org) by 12:00 pm (EST) Wednesday, April 27th, 2011, that samples have not arrived or are unacceptable for testing. Failure to notify the section will result in a score of zero. The deadline for reporting results is Wednesday, May 18th, 2011.

Sincerely,

Patrick J. Parsons, Ph.D.
Chief
Laboratory of Inorganic and Nuclear Chemistry

Mary Frances Verostek, Ph.D.
Assistant Section Head
PT Program for Blood Lead /EP/Trace Elements

**New York State Department of Health
Blood Lead Test Results, 2011 Event #1
PERFORMANCE OF PARTICIPATING LABORATORIES**

Lab Code	Method	Results ($\mu\text{g/dL}$ whole blood)					Normalized Mean	Info Only
		BE11-01	BE11-02	BE11-03	BE11-04	BE11-05		
Target values:		28	40	16	8	10		
103	DRC/CC-ICP-MS	27	38	16	8	10	0.97	
103	ASV-LeadCare	30	43	16	8	12	1.09	Info
104	ETAAS-Z	28	42	18	9	10	1.06	
106	ICP-MS	28	40	16	8	11	1.03	Info
107	ICP-MS	28	41	17	8	11	1.05	
107	ASV-LeadCare	27	40	15	7	12	1.03	Info
107	ASV-LeadCare	26	39	14	6	12	0.99	Info
109	ETAAS-Z	28	39	17	9	11	1.03	
109	ICP-MS	28	40	16	8	10	1.00	
109	ASV-LeadCare	26	39	16	6	11	1.00	Info
109	ASV-LeadCare	26	40	17	9	12	1.05	Info
110	ETAAS-Z	30	42	18	8	11	1.09	
110	ICP-MS	28	40	16	8	10	1.00	
110	ASV-LeadCare	28	40	16	7	12	1.05	Info
110	ASV-LeadCare	24	36	16	7	9	0.92	Info
112	ASV-3010	26	38	14	5	8	0.92	
114	ETAAS-Z	29	44	17	8	12	1.10	
116	ICP-MS	29	41	16	8	11	1.04	Info
121	ETAAS-Z	28	38	15	8	10	0.96	
123	ETAAS-Z	26	37	15	8	10	0.93	
126	ETAAS-Z	27	39	16	8	11	1.01	
131	ETAAS-Z	33 \uparrow	44	18	8	10	1.13	
132	ETAAS-Z	30	41	18	8	11	1.08	
143	ETAAS-Z	25	37	15	7	9	0.92	
144	ETAAS-Z	31	42	17	8	11	1.08	
146	ETAAS-Z	26	38	16	7	10	0.96	
147	ICP-MS	26	37	15	8	10	0.93	
150	ASV-LeadCare	26	30 \downarrow	12	5	10	0.81	
156	ICP-MS	25	36	14	7	9	0.89	
158	ICP-MS	28	41	16	8	10	1.01	

notes: \uparrow reported value outside upper limit
 \downarrow reported value outside lower limit
 \blacksquare : Unacceptable result

Normalized mean: The average of each reported result divided by the corresponding target value. It measures bias.
Info only: results included for informational purposes only.

**New York State Department of Health
Blood Lead Test Results, 2011 Event #1
PERFORMANCE OF PARTICIPATING LABORATORIES**

Lab Code	Method	Results ($\mu\text{g/dL}$ whole blood)					Normalized Mean	Info Only
		BE11-01	BE11-02	BE11-03	BE11-04	BE11-05		
Target values:		28	40	16	8	10		
159	ICP-MS	28	41	18	9	11	1.06	
160	ETAAS-Z	29	45 ↑	18	9	12	1.12	
164	ICP-MS	28	39	16	8	10	0.99	
166	ASV-3010	28	40	16	8	12	1.05	
168	ETAAS-Z	29	44	17	9	12	1.10	
179	ICP-MS	28	41	16	8	11	1.03	
197	ICP-MS	26	38	15	9	10	0.94	
198	ETAAS-Z	26	40	17	8	10	1.00	
199	ICP-MS	28	37	15	7	10	0.95	
200	ETAAS-Z	31	45 ↑	18	8	11	1.11	Info
204	ASV-3010	25	36	14	6	10	0.89	
206	ICP-MS	27	37	15	8	10	0.94	
208	ETAAS-Z	26	39	16	8	11	1.00	
215	ETAAS-Z	25	35 ↓	16	10	12	0.99	
221	ETAAS-Z	31	45 ↑	19	9	13	1.18	
232	ASV-3010	29	42	17	7	10	1.05	
237	ETAAS-Z	28	38	15	8	10	0.96	
243	ASV-3010	27	41	15	7	9	0.98	
249	ASV-3010	26	40	15	7	9	0.96	
254	ETAAS-Z	24	37	15	7	9	0.91	
255	ETAAS-Z	28	40	17	8	11	1.04	
261	ETAAS-Z	29	40	17	8	11	1.05	
269	ETAAS-Z	24	35 ↓	14	6	7	0.87	
271	ASV-3010	26	42	18	9	13	1.10	
272	ETAAS-Z	29	39	16	8	11	1.03	
279	ETAAS-Z	27	40	15	8	9	0.97	
282	ASV-3010	27	42	16	6	11	1.03	
286	ASV-LeadCare	27	41	16	6	11	1.02	
290	ICP-MS	28	42	17	9	10	1.04	
291	ASV-3010	30	45 ↑	19	11	13	1.21	

notes: ↑ reported value outside upper limit
 ↓ reported value outside lower limit
 ■ : Unacceptable result

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**New York State Department of Health
Blood Lead Test Results, 2011 Event #1
PERFORMANCE OF PARTICIPATING LABORATORIES**

Lab Code	Method	Results ($\mu\text{g/dL}$ whole blood)					Normalized Mean	Info Only
		BE11-01	BE11-02	BE11-03	BE11-04	BE11-05		
Target values:		28	40	16	8	10		
293	ICP-MS	30	42	17	8	11	1.07	
295	ASV-3010	24	38	15	5	8	0.91	
300	ASV-3010	29	43	15	7	12	1.06	
301	ETAAS-Z	22 ↓	34 ↓	13	7	9	0.82	
305	ETAAS-Z	27	37	16	8	10	0.96	
312	ICP-MS	28	41	17	8	10	1.03	
317	ETAAS-Z	27	36	15	8	10	0.93	
324	HR-ICP-MS	27	38	16	8	10	0.97	
325	ETAAS-Z	29	40	16	8	11	1.03	
333	ETAAS-Z	26	38	15	8	9	0.94	
337	ASV-LeadCare	27		16	8	12	1.05	
339	HR-ICP-MS	28	41	17	8	11	1.05	Info
340	ETAAS-Z	27	39	16	8	11	1.01	
343	ASV-LeadCare	26	39	15	7	13	1.04	Info
348	ETAAS-Z	28	39	16	8	11	1.02	
349	ETAAS-Z	27	38	15	8	10	0.95	
350	ASV-3010	28	41	19	9	12	1.10	
352	ASV-3010	28	40	16	6	9	1.00	
353	ETAAS-Z	25	35 ↓	14	8	9	0.88	
365	ETAAS-Z	26	34 ↓	13	8	9	0.86	
366	ETAAS-Z	23 ↓	43	19	8	12	1.07	Info
367	ICP-MS	28	40	17	8	11	1.04	Info
368	ASV-3010	29	44	17	8	12	1.10	
369	ASV-3010	26	38	15	7	10	0.94	
374	ASV-3010	30	44	18	9	12	1.12	
376	ASV-LeadCare	20 ↓	36	13	6	12	0.91	
383	ETAAS-Z	28	42	16	6	10	1.02	
384	ASV-3010	28	44	14	5	10	0.99	
385	ICP-MS	29	41	17	8	11	1.06	Info
388	ASV-3010	26	37	15	7	10	0.93	

notes: ↑ reported value outside upper limit
 ↓ reported value outside lower limit
 ▀ : Unacceptable result

Normalized mean: The average of each reported result divided by the corresponding target value. It measures bias.
 Info only: results included for informational purposes only.

**New York State Department of Health
Blood Lead Test Results, 2011 Event #1
PERFORMANCE OF PARTICIPATING LABORATORIES**

Lab Code	Method	Results ($\mu\text{g/dL}$ whole blood)					Normalized Mean	Info Only
		BE11-01	BE11-02	BE11-03	BE11-04	BE11-05		
Target values:		28	40	16	8	10		
389	ETAAS-Z	27	39	16	8	11	1.01	
391	ETAAS-Z	29	43	17	8	10	1.06	Info
393	ASV-LeadCare	28	>37	16	8	11	1.03	
395	ICP-MS	28	40	16	8	11	1.03	
401	ETAAS-Z	27	39	15	8	9	0.96	Info
408	ICP-MS	26	37	15	7	10	0.93	Info
410	ICP-MS	28	40	16	8	11	1.03	Info
449	ASV-LeadCare	21 ↓	34 ↓	11 ↓	4	10	0.76	
453	ETAAS-Z	31	43	16	8	10	1.06	Info
455	ASV-LeadCare	29	41	17	7	11	1.06	
461	ASV-3010	26	37	14	8	10	0.91	
463	ASV-LeadCare	29	39	17	7	11	1.04	
464	ASV-LeadCare	28	<37 ▽	14	<6 ▽	>11 ▽	0.94	

Percent satisfactory results for all participants: 96.1 %

notes: ↑ reported value outside upper limit
 ↓ reported value outside lower limit
 ▽ : Unacceptable result

Normalized mean: The average of each reported result divided by the corresponding target value. It measures bias.
 Info only: results included for informational purposes only.

**New York State Department of Health
Blood Lead Test Results, 2011 Event #1
STATISTICAL SUMMARY**

		TARGET VALUE ASSIGNMENT AND STATISTICS				
Lab Code	Method	Results ($\mu\text{g/dL}$ whole blood)				
		BE11-01	BE11-02	BE11-03	BE11-04	BE11-05
103	DRC/CC-ICP-MS	27	38	16	8	10
104	ETAAS-Z	28	42	18	9	10
107	ICP-MS	28	41	17	8	11
109	ETAAS-Z	28	39	17	9	11
109	ICP-MS	28	40	16	8	10
110	ETAAS-Z	30	42	18	8	11
110	ICP-MS	28	40	16	8	10
112	ASV-3010	26	38	14	5	8
147	ICP-MS	26	37	15	8	10
156	ICP-MS	25	36	14	7	9
159	ICP-MS	28	41	18	9	11
164	ICP-MS	28	39	16	8	10
166	ASV-3010	28	40	16	8	12
179	ICP-MS	28	41	16	8	11
198	ETAAS-Z	26	40	17	8	10
199	ICP-MS	28	37	15	7	10
243	ASV-3010	27	41	15	7	9
293	ICP-MS	30	42	17	8	11
324	HR-ICP-MS	27	38	16	8	10
325	ETAAS-Z	29	40	16	8	11
350	ASV-3010	28	41	19	9	12
Number of Sample Measurements:		21	21	21	21	21
Mean (target value):		28	40	16	8	10
Standard Deviation:		1.2	1.8	1.3	0.9	1.0
RSD (%):		4.5	4.5	8.0	11.2	9.3
Acceptable Range:						
Upper Limit:		32	44	20	12	14
Lower Limit:		24	36	12	4	6

notes: Results reported as less than the detection limits are treated as zero for statistical and grading purposes.

**New York State Department of Health
Blood Lead Test Results, 2011 Event #1
STATISTICAL SUMMARY BY METHOD**

	Results ($\mu\text{g/dL}$ whole blood)				
	BE11-01	BE11-02	BE11-03	BE11-04	BE11-05
ASV-3010					
Number of Sample Measurements:	19	19	19	19	19
Mean:	27.3	40.6	15.9	7.2	10.5
Standard Deviation:	1.7	2.7	1.7	1.6	1.6
RSD (%):	6.2	6.7	10.5	22.0	15.0
ASV-LeadCare					
Number of Sample Measurements:	17	14	17	16	16
Mean:	26.4	38.4	15.1	6.8	11.3
Standard Deviation:	2.6	3.3	1.8	1.2	1.0
RSD (%):	10.0	8.7	11.7	18.3	9.0
DRC/CC-ICP-MS					
Number of Sample Measurements:	1	1	1	1	1
Mean:	27.0	38.0	16.0	8.0	10.0
Standard Deviation:	?	?	?	?	?
RSD (%):	—	—	—	—	—
ETAAS-Z					
Number of Sample Measurements:	42	42	42	42	42
Mean:	27.5	39.6	16.1	8.0	10.4
Standard Deviation:	2.3	3.1	1.4	0.7	1.1
RSD (%):	8.4	7.8	8.9	9.0	11.0
HR-ICP-MS					
Number of Sample Measurements:	2	2	2	2	2
Mean:	27.5	39.5	16.5	8.0	10.5
Standard Deviation:	0.7	2.1	0.7	0.0	0.7
RSD (%):	—	—	—	—	—
ICP-MS					
Number of Sample Measurements:	22	22	22	22	22
Mean:	27.7	39.6	16.0	8.0	10.4
Standard Deviation:	1.1	1.8	1.0	0.5	0.6
RSD (%):	4.0	4.6	5.9	6.7	5.7
All Laboratories					
Number of Sample Measurements:	103	100	103	102	102
Mean:	27.3	39.6	15.9	7.6	10.6
Standard Deviation:	2.1	2.8	1.5	1.1	1.1
RSD (%):	7.5	7.1	9.2	14.2	10.9

notes: ? Insufficient data for calculation.

**New York State Department of Health
Blood Lead Test Results, 2011 Event #1
STATISTICAL SUMMARY BY CLASS**

	Results ($\mu\text{g/dL}$ whole blood)				
	BE11-01	BE11-02	BE11-03	BE11-04	BE11-05
Evaluated					
Number of Sample Measurements:	62	59	62	61	61
Mean:	27.1	39.3	15.7	7.6	10.5
Standard Deviation:	2.3	3.3	1.6	1.2	1.2
RSD (%):	8.3	8.3	10.0	16.3	11.5
Info					
Number of Sample Measurements:	20	20	20	20	20
Mean:	27.5	40.5	16.2	7.6	11.1
Standard Deviation:	2.1	2.2	1.2	0.8	1.1
RSD (%):	7.6	5.3	7.1	9.9	9.5
Reference					
Number of Sample Measurements:	21	21	21	21	21
Mean:	27.7	39.7	16.3	7.9	10.3
Standard Deviation:	1.2	1.8	1.3	0.9	1.0
RSD (%):	4.5	4.5	8.0	11.2	9.3
All Laboratories					
Number of Sample Measurements:	103	100	103	102	102
Mean:	27.3	39.6	15.9	7.6	10.6
Standard Deviation:	2.1	2.8	1.5	1.1	1.1
RSD (%):	7.5	7.1	9.2	14.2	10.9

notes: ? Insufficient data for calculation.

**New York State Department of Health
Blood Lead Test Results, 2011 Event #1**

METHOD NOTES

ATOMIC SPECTROMETRY METHODS

- A-1 ETAAS-Z (Electrothermal atomic absorption spectrometry with Zeeman background correction)
- A-2 ETAAS other (i.e., D₂, S-H background correction)
- A-3 FAAS (Flame atomic absorption spectrometry)
- A-4 CV-AAS (Cold vapor atomic absorption spectrometry)
- A-5 HG-AAS (Hydride generation atomic absorption spectrometry)
- A-6 AFS (Atomic fluorescence spectrometry)
- A-7 Other

INDUCTIVELY COUPLED PLASMA

- P-1 ICP-MS (Inductively coupled plasma - mass spectrometry)
- P-2 DRC/CC-ICP-MS (ICP-MS used in the Dynamic Reaction Cell or Collision Cell mode)
- P-3 ICP-AES/OES (ICP atomic/optical emission spectrometry)
- P-4 HR-ICP-MS (High resolution ICP-MS)
- P-5 ETV-ICP-MS (Electrothermal vaporization ICP-MS)
- P-6 ID-ICP-MS (Isotope dilution ICP-MS)
- P-7 Other

ELECTROCHEMICAL METHODS

- E-1 ASV (Anodic stripping voltammetry without digestion)
- E-2 ASV-LeadCare[®] (Anodic stripping voltammetry using the ESA LeadCare[®] system)
- E-3 Fluoride specific electrode
- E-4 Other

MOLECULAR FLUORIMETRY

- F-1 EtOAc (Ethyl acetate-acetic acid extraction method for determination of erythrocyte protoporphyrin)
- F-2 Aviv hematofluorometry (for determination of EP at hematocrit 35)
- F-3 Helena ZPP (for determination of zinc protoporphyrin in $\mu\text{mol ZPP/mol heme}$)
- F-4 Other

OTHER METHODS

If your method is not listed in the above list, please describe it briefly.
