



**Department
of Health**

**Wadsworth
Center**

TOXICOLOGY – Blood Lead

Proficiency Test Report

Event #2, 2015

July 2nd, 2015



ANDREW M. CUOMO
Governor

Department of Health

HOWARD A. ZUCKER, M.D., J.D.
Commissioner

SALLY DRESLIN, M.S., R.N.
Executive Deputy Commissioner

July 2, 2015

TOXICOLOGY – Blood Lead **Event #2, 2015**

Dear Laboratory Director:

A statistical summary report for all proficiency test (PT) results evaluated in the second blood lead event of 2015 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, May 5th, 2015, 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 5 µg/dL to 17 µg/dL. Aliquots of whole blood were transferred into cryovials, and shipped to participating laboratories Wednesday, May 6th, 2015. PT samples for laboratories using the LeadCare[®] system were shipped by overnight express for delivery Wednesday, May 6th, 2015. Target values were established by a ≥90% consensus of 19 measurements performed by 17 reference laboratories using ICP-MS and ETAAS methods.

Certification for CLIA '88 and OSHA Purposes

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, September 16th, 2015. The laboratory is required to notify the section (trel@health.ny.gov) 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, September 15th, 2015, for delivery Wednesday, September 16th, 2015. These laboratories are required to notify the section (trel@health.ny.gov) by 12:00 pm (EST) the day after shipment 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, October 7th, 2015.

Sincerely,

Patrick J. Parsons, Ph.D.
Chief, Laboratory of Inorganic and Nuclear Chemistry
Deputy Director, Division of Environmental Health

Mary Frances Verostek, Ph.D.
Assistant Section Head
PT Program for Blood Lead/Trace Elements
Biggs Laboratory - Wadsworth Center
New York State Department of Health
PO Box 509
Albany NY 12201-0509
www.wadsworth.org/testing/lead/index.htm

New York State Department of Health
Blood Lead Test Results, 2015 Event #2
PERFORMANCE OF PARTICIPATING LABORATORIES

Lab Code	Method	Results (µg/dL whole blood)					Normalized Mean	Info Only
		BE15-06	BE15-07	BE15-08	BE15-09	BE15-10		
Target values:		12	17	10	5	5		
103	DRC/CC-ICP-MS	12	17	10	5	5	1.00	
104	ETAAS-Z	12	18	10	5	5	1.03	
106	ICP-MS	12	17	10	6	5	1.00	Info
107	ASV-LeadCare II	12	17	9	6	5	1.00	Info
107	ICP-MS	12	17	9.7	5.5	4.8	1.00	
109	ASV-LeadCare II	11	15	8	5	4	0.90	Info
109	ICP-MS	12.6	16.5	9.6	5.4	4.6	1.04	
109	ETAAS-Z	12	18	10	5	4	1.03	
110	ICP-MS	12	16	10	5	4	0.97	
110	ETAAS-Z	12	16	9	5	4	0.97	
110	ASV-LeadCare II	16	21	11	6	5	1.22	Info
112	ETAAS-Z	13	18	10	5	5	1.07	
114	ICP-MS	12	17	10	5	5	1.00	
116	DRC/CC-ICP-MS	12	17	10	6	5	1.00	Info
121	ETAAS-Z	14	20	12	6	5	1.18	Info
123	ETAAS-Z	10	13	8	5	4	0.76	
126	ICP-MS	11	16	9	5	4	0.93	
131	ETAAS-Z	12	15	10	7	4	0.94	
143	ETAAS-Z	11	17	9	5	4	0.96	
144	ETAAS-Z	11	16	9	5	4	0.93	
147	ICP-MS	12	16	10	5	5	0.97	
150	ETAAS-Z	15	21	11	6	6	1.20	
156	DRC/CC-ICP-MS	12	15	10	6	5	0.94	

Notes: ↑ reported value outside upper limit
↓ reported value outside lower limit

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.

ND: non-detect

▼: Result unacceptable

New York State Department of Health
Blood Lead Test Results, 2015 Event #2
PERFORMANCE OF PARTICIPATING LABORATORIES

Lab Code	Method	Results (µg/dL whole blood)					Normalized Mean	Info Only
		BE15-06	BE15-07	BE15-08	BE15-09	BE15-10		
Target values:		12	17	10	5	5		
158	ICP-MS	13	17	10	6	5	1.04	
160	ICP-MS	12	16	9	5	5	0.97	
164	ICP-MS	12	17	10	6	5	1.00	
166	ETAAS-Z	12	16	9	5	4	0.97	
168	ETAAS-Z	14	18	10	6	6	1.11	
179	DRC/CC-ICP-MS	12	17	10	6	5	1.00	
197	ICP-MS	11	15	9	5	4	0.90	
198	ETAAS-Z	12	17	10	5	5	1.00	
200	ICP-MS	11	16	10	6	5	0.93	
204	ASV-LeadCare Ultra	13	16	9	6	4	1.01	
206	ICP-MS	12	16	9	5	5	0.97	
208	ETAAS-Z	10	14	8	4	4	0.82	
237	ETAAS-Z	12	17	10	6	5	1.00	
254	ETAAS-Z	11	15	9	5	4	0.90	
255	ETAAS-Z	14	17	10	6	5	1.08	
269	ETAAS-Z	9	12 ↓	9	4	3	0.71	
272	ETAAS-Z	13	16	9	5	3	1.01	
279	ETAAS-Z	12	17	10	5	4	1.00	
290	ICP-MS	11	14	9	5	4	0.87	
291	ASV-LeadCare Ultra	12	17	10	6	5	1.00	
293	ICP-MS	12	16	9	5	4	0.97	
295	ASV-3010	8	13	7	4	2	0.76	
301	ETAAS Other	11	15	9	5	4	0.90	

Notes: ↑ reported value outside upper limit
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New York State Department of Health
Blood Lead Test Results, 2015 Event #2
PERFORMANCE OF PARTICIPATING LABORATORIES

Lab Code	Method	Results (µg/dL whole blood)					Normalized Mean	Info Only
		BE15-06	BE15-07	BE15-08	BE15-09	BE15-10		
Target values:		12	17	10	5	5		
305	FAAS	12	16	10	6	5	0.97	
312	ICP-MS	11	14	8	5	4	0.87	
317	ETAAS-Z	13	17	10	6	5	1.04	
324	ETAAS-Z	11.5	17.0	9.4	5.0	4.0	1.00	
325	ETAAS-Z	12	16	9	5	5	0.97	
333	ETAAS-Z	12	16	10	6	7	0.97	
337	ASV-LeadCare II	12	17	8	<3	5	1.00	
340	ETAAS-Z	11	15	9	4	4	0.90	
343	ASV-LeadCare Ultra	13	17	9	5	3	1.04	Info
343	ASV-LeadCare	12	16	8	5	5	0.97	Info
343	ASV-LeadCare II	13	16	8	5	4	1.01	Info
345	ASV-LeadCare II	13	17	10	4	5	1.04	
348	ETAAS-Z	13	17	10	6	5	1.04	
349	ETAAS-Z	11	15	8	4	3	0.90	
350	ASV-LeadCare Ultra	11	15	9	5	4	0.90	
365	ETAAS-Z	12	17	10	6	5	1.00	
366	ICP-MS	12	17	10	5.2	4	1.00	Info
368	ASV-3010	12	16	10	6	4	0.97	
369	ASV-LeadCare Ultra	10	16	9	3	4	0.94	
374	ASV-LeadCare Ultra	13	18	9	6	4	1.07	
384	ASV-3010	11	14	7	3	<1	0.87	
388	ICP-MS	11	16	8	4	3	0.93	
389	ETAAS-Z	12	16	9	5	4	0.97	

Notes: ↑ reported value outside upper limit
↓ reported value outside lower limit

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.

ND: non-detect

▼: Result unacceptable

New York State Department of Health
Blood Lead Test Results, 2015 Event #2
PERFORMANCE OF PARTICIPATING LABORATORIES

Lab Code	Method	Results (µg/dL whole blood)					Normalized Mean	Info Only
		BE15-06	BE15-07	BE15-08	BE15-09	BE15-10		
Target values:		12	17	10	5	5		
391	ETAAS-Z	10.4	14.7	8.2	4.8	4.2	0.86	Info
393	ASV-LeadCare II	12	15	8	4	4	0.94	
401	DRC/CC-ICP-MS	12.0	16.4	9.7	5.4	4.8	0.97	Info
410	ICP-MS	12	17	10	5	5	1.00	Info
461	ASV-LeadCare Ultra	12	16	9	6	4	0.97	
464	ASV-LeadCare II	14	21	10	5	5	1.20	
466	ASV-LeadCare II	12	16	8	4	5	0.97	
469	ICP-MS	11	15	9	5	4	0.90	
470	ASV-LeadCare II	11	16	8	5	4	0.93	
476	ASV-LeadCare	13	16	8	4	5	1.01	
477	ASV-LeadCare II	11	14	7	5	4	0.87	
482	ASV-LeadCare II	12	15	7	4	5	0.94	
484	ICP-MS	13	15	8	5	3	0.98	

Percent satisfactory results for all participants: 99.8 %

Notes: ↑ reported value outside upper limit
↓ reported value outside lower limit

Normalized Mean: The average of each reported result divided by the corresponding target value. It measures bias.

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**New York State Department of Health
Blood Lead Test Results, 2015 Event #2
STATISTICAL SUMMARY**

TARGET VALUE ASSIGNMENT AND STATISTICS						
Lab Code	Method	Results (µg/dL whole blood)				
		BE15-06	BE15-07	BE15-08	BE15-09	BE15-10
103	DRC/CC-ICP-MS	12	17	10	5	5
104	ETAAS-Z	12	18	10	5	5
107	ICP-MS	12	17	9.7	5.5	4.8
109	ICP-MS	12.6	16.5	9.6	5.4	4.6
109	ETAAS-Z	12	18	10	5	4
110	ICP-MS	12	16	10	5	4
110	ETAAS-Z	12	16	9	5	4
112	ETAAS-Z	13	18	10	5	5
147	ICP-MS	12	16	10	5	5
156	DRC/CC-ICP-MS	12	15	10	6	5
160	ICP-MS	12	16	9	5	5
164	ICP-MS	12	17	10	6	5
166	ETAAS-Z	12	16	9	5	4
179	DRC/CC-ICP-MS	12	17	10	6	5
198	ETAAS-Z	12	17	10	5	5
200	ICP-MS	11	16	10	6	5
293	ICP-MS	12	16	9	5	4
324	ETAAS-Z	11.5	17.0	9.4	5.0	4.0
325	ETAAS-Z	12	16	9	5	5
Number of Sample Measurements:		19	19	19	19	19
Mean (target value):		12	17	10	5	5
Standard Deviation:		0.4	0.8	0.4	0.4	0.5
RSD (%):		3.2	5.0	4.6	8.0	10.0
Acceptable Range:						
Upper Limit:		16	21	14	9	9
Lower Limit:		8	13	6	1	1

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, 2015 Event #2
STATISTICAL SUMMARY BY CLASS

Results (µg/dL whole blood)					
	BE15-06	BE15-07	BE15-08	BE15-09	BE15-10
Evaluated					
Number of Sample Measurements:	50	50	50	49	49
Mean:	11.8	15.9	9.0	5.0	4.3
Standard Deviation:	1.3	1.7	1.0	0.9	0.9
RSD (%):	10.9	10.4	10.9	17.6	20.2
Info					
Number of Sample Measurements:	13	13	13	13	13
Mean:	12.4	17.0	9.5	5.4	4.5
Standard Deviation:	1.4	1.7	1.2	0.5	0.6
RSD (%):	11.2	10.3	13.1	9.2	14.1
Reference					
Number of Sample Measurements:	19	19	19	19	19
Mean:	12.0	16.6	9.7	5.3	4.7
Standard Deviation:	0.4	0.8	0.4	0.4	0.5
RSD (%):	3.2	5.0	4.6	8.0	10.0
All Laboratories					
Number of Sample Measurements:	82	82	82	81	81
Mean:	11.9	16.2	9.2	5.2	4.4
Standard Deviation:	1.2	1.6	1.0	0.8	0.8
RSD (%):	9.8	9.7	10.5	14.7	17.3

notes: ? Insufficient data for calculation.

**New York State Department of Health
Blood Lead Test Results, 2015 Event #2
STATISTICAL SUMMARY BY METHOD**

		Results (µg/dL whole blood)				
		BE15-06	BE15-07	BE15-08	BE15-09	BE15-10
ASV-3010						
Number of Sample Measurements:		3	3	3	3	2
Mean:		10.3	14.3	8.0	4.3	3.0
Standard Deviation:		2.1	1.5	1.7	1.5	1.4
RSD (%):		—	—	—	—	—
ASV-LeadCare						
Number of Sample Measurements:		2	2	2	2	2
Mean:		12.5	16.0	8.0	4.5	5.0
Standard Deviation:		0.7	0.0	0.0	0.7	0.0
RSD (%):		—	—	—	—	—
ASV-LeadCare II						
Number of Sample Measurements:		12	12	12	11	12
Mean:		12.4	16.7	8.5	4.8	4.6
Standard Deviation:		1.4	2.2	1.2	0.8	0.5
RSD (%):		11.6	13.4	14.6	15.6	11.2
ASV-LeadCare Ultra						
Number of Sample Measurements:		7	7	7	7	7
Mean:		12.0	16.4	9.1	5.3	4.0
Standard Deviation:		1.2	1.0	0.4	1.1	0.6
RSD (%):		9.6	5.9	4.1	21.1	14.4
DRC/CC-ICP-MS						
Number of Sample Measurements:		5	5	5	5	5
Mean:		12.0	16.5	9.9	5.7	5.0
Standard Deviation:		0.0	0.9	0.1	0.5	0.1
RSD (%):		0.0	5.3	1.3	8.1	1.8
ETAAS Other						
Number of Sample Measurements:		1	1	1	1	1
Mean:		11.0	15.0	9.0	5.0	4.0
Standard Deviation:		?	?	?	?	?
RSD (%):		—	—	—	—	—
ETAAS-Z						
Number of Sample Measurements:		30	30	30	30	30
Mean:		12.0	16.4	9.5	5.2	4.5
Standard Deviation:		1.3	1.8	0.9	0.7	0.9
RSD (%):		11.0	11.1	9.3	14.0	20.0
FAAS						
Number of Sample Measurements:		1	1	1	1	1
Mean:		12.0	16.0	10.0	6.0	5.0
Standard Deviation:		?	?	?	?	?
RSD (%):		—	—	—	—	—

notes: ? Insufficient data for calculation.

A Standard Deviation displayed as 0.0 should be interpreted as <0.1 (see DRC/CC-ICP-MS and HR-ICP-MS participants)

**New York State Department of Health
Blood Lead Test Results, 2015 Event #2
STATISTICAL SUMMARY BY METHOD**

Results ($\mu\text{g/dL}$ whole blood)					
	BE15-06	BE15-07	BE15-08	BE15-09	BE15-10
ICP-MS					
Number of Sample Measurements:	21	21	21	21	21
Mean:	11.8	16.0	9.3	5.2	4.4
Standard Deviation:	0.6	1.0	0.7	0.5	0.7
RSD (%):	5.5	6.0	7.7	9.3	14.9
All Laboratories					
Number of Sample Measurements:	82	82	82	81	81
Mean:	11.9	16.2	9.2	5.2	4.4
Standard Deviation:	1.2	1.6	1.0	0.8	0.8
RSD (%):	9.8	9.7	10.5	14.7	17.3

notes: ? Insufficient data for calculation.

A Standard Deviation displayed as 0.0 should be interpreted as <0.1 (see DRC/CC-ICP-MS and HR-ICP-MS participants)

**New York State Department of Health
Blood Lead Test Results, 2015 Event #2**

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)

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)

ELECTROCHEMICAL METHODS

- E-1 ASV (Anodic stripping voltammetry without digestion)
- E-2 ASV-LeadCare® Blood Lead Testing System
- E-5 ASV-LeadCare® II Blood Lead Testing System
- E-6 ASV-LeadCare® Ultra™ Blood Lead Testing System
- E-3 Fluoride specific electrode

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 $\mu\text{mol ZPP/mol heme}$)

OTHER METHODS

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