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**Wadsworth Center**

**New York State Department of Health**

**BLOOD LEAD**

**Proficiency Test Report**

**Event #3, 2007**

**December 17, 2007**

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# 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

Richard F. Daines, M.D.  
Commissioner

Wendy E. Saunders  
Chief of Staff

December 17, 2007

## **TOXICOLOGY – Blood Lead Event #3, 2007**

Dear Laboratory Director:

A statistical summary report for all proficiency test (PT) results evaluated in the third blood lead event of 2007 is enclosed. Participating laboratories are identified by a confidential three-digit code number assigned by the PT program. 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 November 7th, 2007, 400-500 mL of blood were drawn from each animal into a blood bag containing 750 mg K<sub>2</sub>EDTA. The animals provided pools with lead concentrations ranging from 2 µg/dL to 34 µg/dL. Aliquots of whole blood were transferred into cryovials, and shipped to participating laboratories November 8th, 2007. PT samples for laboratories using the LeadCare<sup>®</sup> system were shipped by overnight express for delivery November 8th, 2007. Target values were established by a ≥90% consensus of 15 measurements performed by 13 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 whom 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: John C. Germ at 801-233-4925.

**The next PT event for blood lead is scheduled to be mailed March 12th, 2008.** Please inform our laboratory staff at (518) 474-4484 if the test materials have not arrived within five days of the scheduled mailout date. The deadline for reporting results is **April 3rd, 2008.**

Thank you for your participation.

Sincerely,



Patrick J. Parsons, Ph.D.  
Section Head, Blood Lead Proficiency Testing Program

**New York State Department of Health  
Blood Lead Test Results, 2007 Event #3  
PERFORMANCE OF PARTICIPATING LABORATORIES**

Lab Code	Method	Results ( $\mu\text{g/dL}$ whole blood)					Normalized Mean	Info Only
		BE07-11	BE07-12	BE07-13	BE07-14	BE07-15		
Target Values:		34	20	2	30	16		
102	ICP-MS	34	20	2	30	16	1.00	
103	ETAAS-Z	32	19	2	29	16	0.96	
103	ASV-LeadCare	28 ↓	17	2	26	12	0.82	Info
104	ETAAS-Z	32	19	3	28	15	0.94	
107	DRC/CC-ICP-MS	33	20	3	30	16	0.99	
107	ASV-LeadCare	30	19	2	26	14	0.89	Info
107	ASV-LeadCare	35	22	<3.3	33	17	1.07	Info
108	ETAAS-Z	34	19	3	30	17	1.00	
109	ETAAS-Z	36	22	2	33	18	1.10	
109	ASV-LeadCare	27 ↓	17	2	26	12	0.82	Info
109	ICP-MS	34	20	3	30	16	1.00	
110	ETAAS-Z	36	21	3	32	18	1.08	
110	ASV-LeadCare	32	18	1	28	14	0.91	Info
110	ICP-MS	33	20	2	30	17	1.01	
112	ASV-3010	38	22	3	30	16	1.05	
114	ETAAS-Z	34	18	2	30	19	1.02	
115	ETAAS-Z	34	21	3	29	20	1.07	
116	ICP-MS	34	19	2	30	16	0.99	Info
121	ETAAS-Z	33	18	1	29	16	0.96	Info
123	ETAAS-Z	34	18	3	28	16	0.96	
126	ETAAS-Z	34	20	2	31	17	1.02	
131	ETAAS-Z	35	21	3	31	17	1.04	
132	ETAAS-Z	31	18	2	27	15	0.91	
143	ETAAS-Z	36	22	3	33	18	1.10	
144	ETAAS-Z	33	18	<2	27	15	0.93	
145	ASV-LeadCare	34	23	<3	32	15	1.04	
146	ETAAS-Z	32	19	2	29	16	0.96	
147	ICP-MS	31	18	3	27	15	0.91	
150	ASV-LeadCare	29 ↓	20	2	27	15	0.92	

**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.

**New York State Department of Health  
Blood Lead Test Results, 2007 Event #3  
PERFORMANCE OF PARTICIPATING LABORATORIES**

Lab Code	Method	Results ( $\mu\text{g/dL}$ whole blood)					Normalized Mean	Info Only
		BE07-11	BE07-12	BE07-13	BE07-14	BE07-15		
Target Values:		34	20	2	30	16		
156	ICP-MS	31	17	2	26	15	0.89	
158	ETAAS-Z	34	20	2	30	17	1.02	
159	ICP-MS	31	18	<3	27	15	0.91	
160	ETAAS-Z	32	20	3	28	16	0.97	
164	ETAAS-Z	34	20	2	29	16	0.99	
166	ASV-3010	32	17	<2	28	14	0.90	
168	ETAAS-Z	35	20	2	30	16	1.01	
170	ETAAS Other	33	19	2	29	16	0.97	
179	ICP-MS	34	20	3	29	16	0.99	
181	ETAAS-Z	33	18	<1	28	14	0.92	
197	ICP-MS	32	18	2	28	15	0.93	
198	ETAAS-Z	33	20	2	30	16	0.99	
199	ETAAS-Z	32	22	2	28	16	0.99	
200	ETAAS-Z	35	19	2	30	17	1.01	
204	ASV-3010	33	19	2	27	15	0.94	
206	ICP-MS	33	19	3	27	16	0.96	
208	ETAAS-Z	22 ↓	17	<3	26	15	0.83	
215	ETAAS-Z	29 ↓	18	3	26	14	0.87	
221	ETAAS-Z	35	20	3	30	16	1.01	
232	ASV-3010	35	20	1	29	14	0.97	
237	ETAAS-Z	30	19	3	28	16	0.94	
243	ASV-3010	34	18	1	28	15	0.94	
249	ASV-3010	34	18	2	30	16	0.98	
254	ETAAS-Z	31	19	2	27	15	0.92	
255	ETAAS-Z	35	21	3	30	17	1.04	
261	ETAAS-Z	29 ↓	17	3	26	14	0.86	
269	ETAAS-Z	31	19	2	30	16	0.97	
270	ETAAS-Z	31	20	<2	27	15	0.94	
271	ASV-3010	30	17	<1	32	13	0.90	

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Blood Lead Test Results, 2007 Event #3  
PERFORMANCE OF PARTICIPATING LABORATORIES**

Lab Code	Method	Results ( $\mu\text{g/dL}$ whole blood)					Normalized Mean	Info Only
		BE07-11	BE07-12	BE07-13	BE07-14	BE07-15		
Target Values:		34	20	2	30	16		
272	ETAAS-Z	35	21	3	30	17	1.04	
279	ETAAS-Z	30	16	2	26	13	0.84	
282	ASV-3010	27 ↓	18	2	25 ↓	14	0.85	
286	ASV-3010	33	20	<2	28	14	0.94	
290	ICP-MS	33	19	2	30	16	0.98	
291	ASV-3010	35	21	2	31	17	1.04	
293	ICP-MS	35	20	2	34	28 ↑	1.23	Info
295	ASV-3010	34	20	3	30	16	1.00	
300	ASV-3010	32	18	<3	29	14	0.92	
301	ETAAS-Z	33	19	2	27	14	0.92	
305	ETAAS-Z	32	19	3	29	16	0.96	
309	ETAAS-Z	38	21	3	31	16	1.05	
310	ASV-3010	35	20	4	31	16	1.02	
312	DRC/CC-ICP-MS	35	20	2	30	16	1.01	
314	ICP-MS	26 ↓	16	2	25 ↓	13	0.80	
317	ETAAS-Z	37	22	3	32	18	1.09	
324	ICP-MS	31	20	5	24 ↓	16	0.93	Info
325	ETAAS-Z	36	20	3	35 ↑	17	1.07	Info
333	ETAAS-Z	31	19	2	28	15	0.93	
339	HR-ICP-MS	33	19	2	29	16	0.97	Info
340	ETAAS-Z	34	20	3	29	16	0.99	
343	ASV-LeadCare	31	18	3	27	15	0.91	Info
347	ETAAS-Z	34	19	1	30	16	0.99	Info
348	ETAAS-Z	34	20	2	30	16	1.00	
349	ETAAS-Z	34	20	3	30	17	1.02	
350	ASV-3010	34	22	4	17 ↓	29 ↑	1.12	
352	ASV-3010	34	24	1	33	17	1.09	
353	ETAAS-Z	32	18	<2	28	15	0.93	
359	ICP-MS	31	19	3	28	15	0.93	

**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.

**New York State Department of Health  
Blood Lead Test Results, 2007 Event #3  
PERFORMANCE OF PARTICIPATING LABORATORIES**

Lab Code	Method	Results ( $\mu\text{g/dL}$ whole blood)					Normalized Mean	Info Only
		BE07-11	BE07-12	BE07-13	BE07-14	BE07-15		
Target Values:		34	20	2	30	16		
365	ETAAS-Z	33	21	3	28	17	1.00	
367	ETAAS-Z	36	21	3	31	17	1.05	Info
368	ASV-3010	31	19	2	28	15	0.93	
369	ASV-3010	30	20	3	27	16	0.95	
370	ASV-LeadCare	30	19	4	29	14	0.92	
374	ASV-3010	33	18	<2	28	16	0.95	
376	ASV-LeadCare	32	17	2	30	14	0.92	
377	ICP-MS	33	19	2	29	15	0.96	
383	ETAAS-Z	32	18	2	28	15	0.93	
384	ASV-3010	28 ↓	15 ↓	<1	26	12	0.80	
385	ICP-MS	34	20	2	30	16	1.00	Info
388	ASV-LeadCare	29 ↓	20	2	27	15	0.92	
389	ETAAS-Z	35	18	3	28	15	0.95	
391	ETAAS other	36	23	6	31	20	1.12	Info
401	ETAAS other	33	19	2	29	15	0.96	Info
404	HR-ICP-MS	31	25 ↑	2	13 ↓	9 ↓	0.87	Info
408	ICP-MS	31	18	2	27	15	0.91	Info
410	ICP-MS	34	20	3	30	16	1.00	Info

Percent satisfactory results for all participants: 96.0 %

**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.

**New York State Department of Health  
Blood Lead Test Results, 2007 Event #3  
STATISTICAL SUMMARY**

		TARGET VALUE ASSIGNMENT AND STATISTICS				
Lab Code	Method	Results ( $\mu\text{g/dL}$ whole blood)				
		BE07-11	BE07-12	BE07-13	BE07-14	BE07-15
102	ICP-MS	34	20	2	30	16
103	ETAAS-Z	32	19	2	29	16
104	ETAAS-Z	32	19	3	28	15
107	DRC/CC-ICP-MS	33	20	3	30	16
109	ETAAS-Z	36	22	2	33	18
109	ICP-MS	34	20	3	30	16
110	ETAAS-Z	36	21	3	32	18
110	ICP-MS	33	20	2	30	17
147	ICP-MS	31	18	3	27	15
164	ETAAS-Z	34	20	2	29	16
179	ICP-MS	34	20	3	29	16
198	ETAAS-Z	33	20	2	30	16
199	ETAAS-Z	32	22	2	28	16
200	ETAAS-Z	35	19	2	30	17
243	ASV-3010	34	18	1	28	15
Number of Sample Measurements:		15	15	15	15	15
<b>Mean (target value):</b>		<b>34</b>	<b>20</b>	<b>2</b>	<b>30</b>	<b>16</b>
Standard Deviation:		1.5	1.2	0.6	1.6	0.9
RSD (%):		4.3	6.0	26.5	5.3	5.8
Acceptable Range:						
Upper Limit:		38	24	6	34	20
Lower Limit:		30	16	0	26	12

**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, 2007 Event #3  
STATISTICAL SUMMARY BY METHOD**

	Results ( $\mu\text{g/dL}$ whole blood)				
	BE07-11	BE07-12	BE07-13	BE07-14	BE07-15
<b>ASV-3010</b>					
Number of Sample Measurements:	19	19	11	19	18
Mean:	32.7	19.3	2.0	28.3	15.0
Standard Deviation:	2.6	2.1	0.8	3.4	1.4
RSD (%):	8.1	10.9	38.7	12.0	9.1
<b>ASV-LeadCare</b>					
Number of Sample Measurements:	11	11	8	11	11
Mean:	30.6	19.1	2.0	28.3	14.3
Standard Deviation:	2.5	2.0	0.5	2.5	1.4
RSD (%):	8.0	10.6	26.7	8.7	10.0
<b>DRC/CC-ICP-MS</b>					
Number of Sample Measurements:	2	2	2	2	2
Mean:	34.0	20.0	2.5	30.0	16.0
Standard Deviation:	1.4	0.0	0.7	0.0	0.0
RSD (%):	—	—	—	—	—
<b>ETAAS other</b>					
Number of Sample Measurements:	3	3	2	3	3
Mean:	34.0	20.3	2.0	29.7	17.0
Standard Deviation:	1.7	2.3	0.0	1.2	2.6
RSD (%):	—	—	—	—	—
<b>ETAAS-Z</b>					
Number of Sample Measurements:	49	49	44	49	49
Mean:	33.1	19.5	2.5	29.2	16.1
Standard Deviation:	2.6	1.4	0.6	1.9	1.3
RSD (%):	7.8	7.3	23.8	6.7	8.3
<b>HR-ICP-MS</b>					
Number of Sample Measurements:	2	2	2	2	2
Mean:	32.0	22.0	2.0	21.0	12.5
Standard Deviation:	1.4	4.2	0.0	11.3	4.9
RSD (%):	—	—	—	—	—
<b>ICP-MS</b>					
Number of Sample Measurements:	19	19	17	19	19
Mean:	32.4	18.9	2.4	28.5	16.2
Standard Deviation:	2.1	1.2	0.5	2.3	3.0
RSD (%):	6.4	6.2	20.9	8.1	18.5
<b>All Laboratories</b>					
Number of Sample Measurements:	105	105	86	105	104
Mean:	32.7	19.4	2.3	28.7	15.7
Standard Deviation:	2.5	1.7	0.6	2.8	2.0
RSD (%):	7.7	8.7	25.9	9.8	12.7

**notes:** ? Insufficient data for calculation.

**New York State Department of Health  
Blood Lead Test Results, 2007 Event #3  
STATISTICAL SUMMARY BY CLASS**

	Results ( $\mu\text{g/dL}$ whole blood)				
	BE07-11	BE07-12	BE07-13	BE07-14	BE07-15
<b>Evaluated</b>					
Number of Sample Measurements:	70	70	54	70	69
Mean:	32.5	19.2	2.4	28.5	15.5
Standard Deviation:	2.7	1.7	0.6	2.3	1.4
RSD (%):	8.2	8.7	23.6	8.1	9.0
<b>Info</b>					
Number of Sample Measurements:	20	20	17	20	20
Mean:	32.7	19.6	2.1	28.4	15.9
Standard Deviation:	2.6	2.0	0.7	4.6	3.7
RSD (%):	7.8	10.1	32.0	16.1	23.1
<b>Reference</b>					
Number of Sample Measurements:	15	15	15	15	15
Mean:	33.5	19.9	2.3	29.5	16.2
Standard Deviation:	1.5	1.2	0.6	1.6	0.9
RSD (%):	4.3	6.0	26.5	5.3	5.8
<b>All Laboratories</b>					
Number of Sample Measurements:	105	105	86	105	104
Mean:	32.7	19.4	2.3	28.7	15.7
Standard Deviation:	2.5	1.7	0.6	2.8	2.0
RSD (%):	7.7	8.7	25.9	9.8	12.7

**notes:** ? Insufficient data for calculation.

**New York State Department of Health  
Blood Lead Test Results, 2007 Event #3  
METHOD NOTES**

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**ATOMIC SPECTROMETRY METHODS**

- A-1 ETAAS-Z (Electrothermal atomic absorption spectrometry with Zeeman background correction)
- A-2 ETAAS other (i.e., D<sub>2</sub>, 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<sup>®</sup> (Anodic stripping voltammetry using the ESA LeadCare<sup>®</sup> 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.

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