Newborn Screening Quality Assurance Program
UDOT Proficiency Testing Panel
Data Evaluation

Quarter 2, 2010

Lab XXX

For a copy of your reported data, print your Excel worksheet.
For summarized analytical information about the third UDOT PT event, go to
http://www.cdc.gov/labstandards/nsqap_reports.html
Under "Quarterly Proficiency Testing Reports," click UDOT. Pages of the 2010 report include:

- UDOT Commentary
- Specimen Certification & Frequency of Outside-Normal-Limits Reports
- Overall Statistics
- By-Method Statistics
- Z scores

x = lab value X = group mean SD = standard deviation

The quantity (x - X) is called the "estimate of laboratory bias" in ISO 5724-4.

$$\text{Z score} = \frac{\text{lab value - group mean}}{\text{group SD}}$$

Z score is a measurement of quality of analytical performance.

$|z| \leq 2$ = satisfactory **$2 < |z| < 3$ = questionable** **$|z| \geq 3$ = unsatisfactory**

Z scores are coded for each lab. Find your Z score code in the Reviewer's Comments box.

Reviewer's Comments

Your Z score can be found above code XX on the charts in the PDF attachment or online.

Your evaluation is based only on the analytes you tested, as indicated by your check-list, and on whether or not you were able to identify the certified/enriched analytes in the panel of specimens. Biotinidase, C0(low), C0(high), C3DC, and C16 were not evaluated. Laboratory consensus of 80% was not achieved for these analytes; therefore, they were declared to be educational challenges.

Each participant received a lab-specific evaluation.

Newborn Screening Quality Assurance Program
UDOT Commentary
Quarter 2, 2010

The UDOT proficiency testing (PT) challenge is a unique component of NSQAP utilizing a panel of specimens that enter the testing scheme in a manner similar to actual newborn specimens; therefore, all analytes on a laboratory's test menu must be considered as a possibility. Results from the 2010 UDOT PT event highlighted some practices that need discussion for the benefit of all participants.

- Five analytes in the PT challenge did not achieve the required 80% consensus for evaluation: low free carnitine [C0(L)], high free carnitine [C0(H)], biotinidase, palmitoylcarnitine (C16) and malonylcarnitine (C3DC). These results reflect the difficulty in PT specimen construction because of the wide variety of analytical methods and cutoff ranges used by participating laboratories.

- Free carnitine [C0(L) and C0(H)] specimens remain educational challenges due to the wide range of cutoffs used by participating laboratories. NSQAP continues to research new ways to produce specimens with C0(L) levels close to zero so we can evaluate all laboratories regardless of cutoff.

- Harmonization of domestic cutoffs continues to be an elusive goal that affects achieving evaluation consensus for several analytes, most notably C0(L) and hydroxyisovalerylcarnitine (C5OH). Table 3 illustrates the wide ranges of cutoffs for these analytes and shows the reported ranges of cutoffs provided by the Region 4 Genetics Collaborative, MS/MS Data Project (www.region4genetics.org) for comparative purposes.

- Laboratories should use their own cutoffs when evaluating PT specimens. Since it does not reflect actual laboratory practice, the use of the NSQAP target cutoffs is not valid.

- C3DC and hydroxybutyrylcarnitine (C4OH) cannot be resolved using non-derivatized MS/MS assays. Laboratories must follow their procedures to identify and report the acylcarnitine present in the specimens.

- In order to provide a better comparison of performance by method, two Z-score charts were created for GALT to cover the types of units reported; however, the two units used (µmol/L blood and U/g Hb) are not interchangeable. Some laboratories reported only a qualitative GALT assessment.

- Laboratories should provide results for all analytes on their test menu. The selective reporting of analytes does not adequately represent laboratory practices and deprives participants of the educational benefit of UDOT PT challenges for performance improvement.

- This is the first time sufficient quantitative results have been reported for biotinidase so that a Z-score chart could be developed for performance comparison. Some laboratories reported only a qualitative biotinidase assessment.

NSQAP strives to continuously enhance the scope of its services and to provide immediate consultation and technical assistance that support the NBS public health laboratory community. Please contact Dr. Víctor R. De Jesús (vdejesus@cdc.gov) for questions regarding these observations.

Newborn Screening Quality Assurance Program
UDOT Proficiency Testing Panel
Specimen Certification & Frequency of Outside-Normal-Limits Reports
Quarter 2, 2010

Specimen Certification				Labs Reporting ONL*	
Specimen	Analyte	Expected Value	Units		Percent (%) ***
0201	IRT	155.8	ng/mL blood	47 of 48	97.9
0202	Phe	237.91	µmol/L blood	64 of 67	95.5
0203	C3DC	1.62	µmol/L blood	33 of 44	75
0204	*Normal*				**
0205	C3	11.76	µmol/L blood	57 of 57	100
0206	Cit	351.13	µmol/L blood	54 of 54	100
0207	C5:1	1.97	µmol/L blood	53 of 54	98.1
0207	C5OH	3.78	µmol/L blood	57 of 57	100
0208	Bio	Abnormal		10 of 46	21.7
0208	C0(low)	7.49	µmol/L blood	21 of 56	37.5
0209	GALT	1.8	U/g Hb	48 of 48	100
0209	TGal	26.8	mg/dL blood	24 of 24	100
0210	*Normal*				
0211	C16	10.97	µmol/L blood	40 of 56	71.4
0211	C18	6.16	µmol/L blood	47 of 50	94
0212	Leu	890.47	µmol/L blood	54 of 56	96.4
0212	Val	498.83	µmol/L blood	40 of 46	87
0213	C4	2.18	µmol/L blood	41 of 50	82
0214	C5DC	1.02	µmol/L blood	58 of 58	100
0215	T4	1.0	µg/dL serum	28 of 28	100
0215	TSH	65.0	µIU/mL serum	54 of 54	100
0216	Tyr	539.41	µmol/L blood	49 of 59	83.1
0216	SUAC	10.00	µmol/L blood	22 of 26	84.6
0217	C6	1.02	µmol/L blood	47 of 55	85.5
0217	C8	2.04	µmol/L blood	59 of 59	100
0217	C10	1.05	µmol/L blood	52 of 54	96.3
0217	C10:1	1.19	µmol/L blood	51 of 51	100
0218	C5	1.09	µmol/L blood	55 of 58	94.8
0219	Met	348.98	µmol/L blood	54 of 54	100
0220	C14	1.60	µmol/L blood	52 of 53	98.1
0220	C14:1	1.38	µmol/L blood	58 of 58	100
0221	17-OHP	80.7	ng/mL serum	50 of 50	100
0222	C0(high)	117.27	µmol/L blood	16 of 35	45.7
0223	C4OH	1.79	µmol/L blood	27 of 28	96.4
0224	C16OH	0.74	µmol/L blood	57 of 58	98.3
0225	Arg	63.85	µmol/L blood	36 of 42	85.7

*Total number of laboratories reporting data per analyte varies.
** Various analytes were reported. (See Table 1)
***A gradable specimen must have 80% or more agreement among laboratories.

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Table 1. Number of Laboratories Reporting Non-Certified Analytes

Specimen	Certified Analyte	Non-Certified Not Expected Analyte(s) (false-positive reports)	Non-Certified Anticipated Analyte(s)
0201	IRT		
0202	Phe		
0203	C3DC	C5OH (6)	
0204	*Normal*	C5OH (5), Cit (1)	
0205	C3	Cit (1)	
0206	Cit	C5OH (7), Arg (1)	
0207	C5:1, C5OH		
0208	Bio, C0(Low)	T4 (1), Met (5)	
0209	TGal, GALT	C16 (2), Cit (2)	
0210	*Normal*		
0211	C16, C18	C5OH (3), Leu (1), Val (1)	
0212	Leu, Val	C4	
0213	C4	C5OH (2), Leu (1), Val (2)	
0214	C5DC		
0215	T4, TSH	C5OH (3), GALT (2), Met (5)	Bio (20/46), C0(low) (14/56)
0216	Tyr, SUAC	Bio (1), C16 (1)	C5OH (11/57)
0217	C6, C8, C10, C10:1	C5OH (1), Cit (1)	
0218	C5	T4 (1), Cit (1)	
0219	Met	Val (3), Cit (1)	
0220	C14, C14:1	C5OH (5), Val (1)	
0221	17-OHP	T4 (2)	
0222	C0(High)	Bio (1), C5OH (3)	
0223	C4OH	C5OH (4), C18 (3)	C3DC (9/44)*
0224	C16OH		
0225	Arg	C5OH (1), Val (1)	

The number in parentheses shows how many labs reported the analyte as outside-normal-limits.

One laboratory reported finding C3 in 16 specimens and C5OH in 21 specimens.

*C3DC and C4OH cannot be resolved using non-derivatized MS/MS assays.
Follow procedures to identify and report the acylcarnitine present in the specimen.

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Table 2. Number of Laboratories with Missed Identifications of Certified Analytes

Specimen	Certified Analyte	Number of Misses (false- negative)
0201	IRT	1
0202	Phe	3
0203	C3DC	11
0204	*Normal*	
0205	C3	0
0206	Cit	0
0207	C5:1, C5OH	C5:1 (1)
0208	Bio, C0(Low)	Bio (36), C0(Low) (35)
0209	GALT, Tgal	0
0210	*Normal*	
0211	C16, C18	C16 (16), C18 (3)
0212	Leu, Val	Leu (2), Val (6)
0213	C4	9
0214	C5DC	0
0215	T4, TSH	0
0216	Tyr, SUAC	Tyr (10), SUAC (4)
0217	C6, C8, C10, C10:1	C6 (8), C10 (2)
0218	C5	3
0219	Met	0
0220	C14, C14:1	C14 (1)
0221	17-OHP	0
0222	C0(High)	19
0223	C4OH	1
0224	C16OH	1
0225	Arg	6

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Table 3. Summary of Reported Cutoff Values

Analyte	N	Min/Max	Mean	Median	Target Range*	Units
T4	28	3.5-9.6	6.2	6		µg/dL serum
TSH	54	10-61	30.8	25		µIU/mL serum
17-OHP	50	7-99	43.9	35		ng/ml serum
Total Galactose	24	6.5-20	11.3	10		mg/dL blood
GALT (U/g Hb)	20	0.7-5	3.1	3.1		U/g Hb
GALT (µmol/L blood)	11	30-60	48.2	50		µmol/L blood
IRT	46	43-140	70.9	62		ng/mL blood
Biotinidase	5	10-21	10.3	10.4		ERU**
Phe	64	97-220	148.22	150	97 - 136	µmol/L blood
Leu	54	200-500	299	300	230 - 261	µmol/L blood
Met	54	35-134	79	75	44 - 46	µmol/L blood
Tyr	49	88-850	335	347	205 - 225	µmol/L blood
Val	39	175-420	274	251	180 - 220	µmol/L blood
Cit	54	18-100	61.77	60	29 - 40	µmol/L blood
Arg	35	25-250	81.40	80	31 - 40	µmol/L blood
SUAC	22	0.50-7	3.20	3	1.32 - 13	µmol/L blood
C0(low)	21	7-16	10.16	9	7.50 - 12	µmol/L blood
C0(high)	16	45-200	71.95	62	60-65	µmol/L blood
C3	57	1.20-10	6	6	4.64 - 5.50	µmol/L blood
C3DC	33	0.10-0.50	0.27	0.27	0.16 - 0.44	µmol/L blood
C4	41	0.49-2	1.31	1.30	0.76 - 1.04	µmol/L blood
C4OH	27	0.27-1.96	0.73	0.70	0.45 - 0.69	µmol/L blood
C5	55	0.40-1.20	0.73	0.70	0.39 - 0.47	µmol/L blood
C5:1	53	0.05-0.86	0.27	0.20	0.08 - 0.24	µmol/L blood
C5DC	58	0.05-0.80	0.33	0.32	0.10 - 0.17	µmol/L blood
C5OH	57	0.19-1.50	0.83	0.84	0.37 - 0.73	µmol/L blood
C6	47	0.16-0.95	0.38	0.25	0.18 - 0.25	µmol/L blood
C8	59	0.25-0.80	0.46	0.40	0.20 - 0.71	µmol/L blood
C10	52	0.18-0.80	0.46	0.43	0.27 - 0.30	µmol/L blood
C10:1	51	0.13-0.56	0.34	0.32	0.18 - 0.25	µmol/L blood
C14	52	0.17-1.20	0.80	0.79	0.49 - 0.80	µmol/L blood
C14:1	58	0.17-1	0.65	0.67	0.35 - 0.71	µmol/L blood
C16	40	0.41-10	7.54	7.65	5.88 - 7.11	µmol/L blood
C16OH	57	0.06-0.37	0.18	0.16	0.09 - 0.19	µmol/L blood
C18	46	0.22-4	2.49	2.29	1.75 - 1.80	µmol/L blood

*Target Range - Data from Region 4 Genetics Collaborative, MS/MS Data Project (5 April 2010) is provided for comparison. For more information, go to www.region4genetics.org.

**ERU - Enzyme Response Units

NEWBORN SCREENING QUALITY ASSURANCE PROGRAM

UDOT Overall Statistics

(Calculations based on All Labs, All Methods)

Year: 2010 Quarter: 2

Specimen	0201	0202	0203	0205	0206	0207	0207	0208	0208
Analyte	IRT	Phe	C3DC	C3	Cit	C5:1	C5OH	C0(low)	Bio
N***	46	62	33	53	54	50	55	20	5
Outliers	1	2	0	4	0	3	2	1	0
Mean	146.8	222.83	1.07	12.42	322.39	1.80	2.09	8.29	10.3
SD	18.8	27.17	0.43	1.29	68.65	0.35	0.30	1.66	1.6
UL (95%)	183.6	276.09	1.92	14.94	456.94	2.48	2.67	11.55	13.4
LL (95%)	110.0	169.58	0.22	9.89	187.84	1.13	1.50	5.04	7.2

Specimen	0209	0209	0209	0211	0211	0212	0212	0213	0214
Analyte	GALT*	GALT**	Total Gal	C16	C18	Leu	Val	C4	C5DC
N***	20	11	24	39	44	53	39	39	58
Outliers	0	0	0	1	3	1	1	2	0
Mean	1.40	9.7	25.15	9.38	5.68	714.70	452.92	1.79	1.0
SD	0.61	1.5	5.35	1.10	0.62	73.87	59.49	0.22	0.4
UL (95%)	2.59	12.6	35.64	11.54	6.90	859.48	569.52	2.21	1.7
LL (95%)	0.21	6.7	14.67	7.21	4.45	569.93	336.32	1.36	0.2

Specimen	0215	0215	0216	0216	0217	0217	0217	0217	0218
Analyte	T4	TSH	Tyr	SUAC	C6	C8	C10	C10:1	C5
N***	28	53	49	21	47	59	52	51	53
Outliers	0	1	0	1	0	0	0	0	2
Mean	1.0	69.64	497.88	5.82	0.89	1.77	0.84	1.14	1.07
SD	0.4	8.27	71.80	3.27	0.18	0.28	0.17	0.22	0.13
UL (95%)	1.8	85.85	638.60	12.24	1.24	2.32	1.17	1.57	1.32
LL (95%)	0.2	53.43	357.15	0.00	0.54	1.23	0.52	0.71	0.81

Specimen	0219	0220	0220	0221	0222	0223	0224	0225
Analyte	Met	C14	C14:1	17-OHP	C0(high)	C4OH	C16OH	Arg
N***	54	50	57	49	15	27	56	36
Outliers	0	2	1	1	1	0	1	0
Mean	352.25	1.31	1.3	103.75	79.35	1.38	0.58	154.93
SD	42.61	0.14	0.2	19.30	7.56	0.41	0.11	73.21
UL (95%)	435.76	1.58	1.7	141.59	94.17	2.19	0.79	298.42
LL (95%)	268.74	1.04	1.0	65.91	64.52	0.57	0.38	11.43

** GALT measured in U/g Hb.*

*** GALT measured in umol/L blood.*

**** Values outside the 99% CI (outliers) were excluded from the calculations. UL = upper limit LL = lower limit*

Newborn Screening Quality Assurance Program
UDOT Statistics - Mean Concentration by Method
Year: 2010 Quarter: 2

Specimen No. 0201		IRT		
		Expected Value 155.8 ng/mL blood		
		N	Mean	SD
Method Code	Method Name			
10	Delfia	5	152.5	13.3
21	AutoDelfia	41	146.1	19.3

Specimen No. 0202		Phe		
		Expected Value 237.91 µmol/L blood		
		N	Mean	SD
Method Code	Method Name			
09	PerkinElmer Neonatal Kit	2	227.07	---*
22	Deriv-MS/MS non-kit	25	219.91	33.18
35	Deriv-MS/MS PE NeoGram MS2 Kit	20	229.20	22.45
47	Fluorometric Manual	2	257.55	---*
60	Non-deriv MS/MS PE NeoBase Kit	11	213.12	19.24

Specimen No. 0203		C3DC		
		Expected Value 1.62 µmol/L blood		
		N	Mean	SD
Method Code	Method Name			
22	Deriv-MS/MS non-kit	19	0.73	0.19
35	Deriv-MS/MS PE NeoGram MS2 Kit	14	1.53	0.15

Methods with N = 1 are not identified.

* SD was not included for N ≤ 3.

Newborn Screening Quality Assurance Program
UDOT Statistics - Mean Concentration by Method
Year: 2010 Quarter: 2

Specimen No. 0205		C3		
		Expected Value 11.76 µmol/L blood		
		N	Mean	SD
Method Code	Method Name			
22	Deriv-MS/MS non-kit	24	13.16	2.11
35	Deriv-MS/MS PE NeoGram MS2 Kit	21	11.76	0.96
60	Non-deriv MS/MS PE NeoBase Kit	11	12.52	0.88

Specimen No. 0206		Cit		
		Expected Value 351.13 µmol/L blood		
		N	Mean	SD
Method Code	Method Name			
22	Deriv-MS/MS non-kit	20	255.06	53.25
35	Deriv-MS/MS PE NeoGram MS2 Kit	21	359.97	30.13
60	Non-deriv MS/MS PE NeoBase Kit	11	348.37	34.69

Specimen No. 0207		C5:1		
		Expected Value 1.97 µmol/L blood		
		N	Mean	SD
Method Code	Method Name			
22	Deriv-MS/MS non-kit	22	1.94	0.56
35	Deriv-MS/MS PE NeoGram MS2 Kit	21	1.70	0.31
60	Non-deriv MS/MS PE NeoBase Kit	9	1.79	0.32

Methods with N = 1 are not identified.

* SD was not included for N ≤ 3.

Newborn Screening Quality Assurance Program
UDOT Statistics - Mean Concentration by Method
Year: 2010 Quarter: 2

Specimen No. 0207		C5OH		
		Expected Value 3.78 µmol/L blood		
		N	Mean	SD
Method Code	Method Name			
22	Deriv-MS/MS non-kit	24	2.14	0.39
35	Deriv-MS/MS PE NeoGram MS2 Kit	21	2.11	0.21
60	Non-deriv MS/MS PE NeoBase Kit	11	1.85	0.22

Specimen No. 0208		C0(low)		
		Expected Value 7.49 µmol/L blood		
		N	Mean	SD
Method Code	Method Name			
22	Deriv-MS/MS non-kit	12	8.17	1.35
35	Deriv-MS/MS PE NeoGram MS2 Kit	3	12.81	---*
60	Non-deriv MS/MS PE NeoBase Kit	6	7.35	0.60

Specimen No. 0208		Bio		
		Expected Value N/A ERU		
		N	Mean	SD
Method Code	Method Name			
34	Astoria-Pacific	5	10.3	1.6

Specimen No. (U/g Hb) 0209		GALT		
		Expected Value 1.8 U/g Hb		
		N	Mean	SD
Method Code	Method Name			
09	PerkinElmer Neonatal Kit	17	1.6	0.4
25	Bio-Rad Quantase	3	0.2	---*

Methods with N = 1 are not identified.

* SD was not included for N ≤ 3.

Newborn Screening Quality Assurance Program
UDOT Statistics - Mean Concentration by Method
Year: 2010 Quarter: 2

Specimen No. (umol/L blood) 0209		GALT		
		Expected Value N/A µmol/L blood		
		N	Mean	SD
Method Code	Method Name			
34	Astoria-Pacific	11	9.66	1.51

Specimen No. 0209		Total Gal		
		Expected Value 26.80 mg/dL blood		
		N	Mean	SD
Method Code	Method Name			
09	PerkinElmer Neonatal Kit	2	22.0	---*
23	Neo-Genesis Accuwell	3	25.0	---*
25	Bio-Rad Quantase	2	32.9	---*
34	Astoria-Pacific	9	26.6	3.2
47	Fluorometric Manual	7	23.6	6.0

Specimen No. 0211		C16		
		Expected Value 10.97 µmol/L blood		
		N	Mean	SD
Method Code	Method Name			
22	Deriv-MS/MS non-kit	21	9.49	1.07
35	Deriv-MS/MS PE NeoGram MS2 Kit	13	8.79	0.85
60	Non-deriv MS/MS PE NeoBase Kit	4	10.02	0.70

Methods with N = 1 are not identified.

* SD was not included for N ≤ 3.

Newborn Screening Quality Assurance Program
UDOT Statistics - Mean Concentration by Method
Year: 2010 Quarter: 2

Specimen No. 0211		C18		
		Expected Value 6.16 µmol/L blood		
		N	Mean	SD
Method Code	Method Name			
22	Deriv-MS/MS non-kit	17	5.95	1.11
35	Deriv-MS/MS PE NeoGram MS2 Kit	18	5.52	0.52
60	Non-deriv MS/MS PE NeoBase Kit	10	5.66	0.60

Specimen No. 0212		Leu		
		Expected Value 890.47 µmol/L blood		
		N	Mean	SD
Method Code	Method Name			
22	Deriv-MS/MS non-kit	22	705.66	113.79
35	Deriv-MS/MS PE NeoGram MS2 Kit	21	717.12	62.14
60	Non-deriv MS/MS PE NeoBase Kit	10	706.74	39.85

Specimen No. 0212		Val		
		Expected Value 498.83 µmol/L blood		
		N	Mean	SD
Method Code	Method Name			
22	Deriv-MS/MS non-kit	16	426.30	73.84
35	Deriv-MS/MS PE NeoGram MS2 Kit	16	468.36	66.23
60	Non-deriv MS/MS PE NeoBase Kit	7	452.98	53.48

Methods with N = 1 are not identified.

* SD was not included for N ≤ 3.

Newborn Screening Quality Assurance Program
UDOT Statistics - Mean Concentration by Method
Year: 2010 Quarter: 2

Specimen No. 0213		C4		
		Expected Value 2.18 µmol/L blood		
		N	Mean	SD
Method Code	Method Name			
22	Deriv-MS/MS non-kit	20	1.83	0.31
35	Deriv-MS/MS PE NeoGram MS2 Kit	11	1.69	0.24
60	Non-deriv MS/MS PE NeoBase Kit	9	1.77	0.12

Specimen No. 0214		C5DC		
		Expected Value 1.02 µmol/L blood		
		N	Mean	SD
Method Code	Method Name			
22	Deriv-MS/MS non-kit	25	0.59	0.17
35	Deriv-MS/MS PE NeoGram MS2 Kit	21	1.26	0.10
60	Non-deriv MS/MS PE NeoBase Kit	11	1.25	0.15

Specimen No. 0215		T4		
		Expected Value 1.0 µg/dL serum		
		N	Mean	SD
Method Code	Method Name			
10	Delfia	2	1.2	---*
21	AutoDelfia	23	0.9	0.3

Specimen No. 0215		TSH		
		Expected Value 65.0 µIU/mL serum		
		N	Mean	SD
Method Code	Method Name			
10	Delfia	5	70.5	10.1
21	AutoDelfia	45	69.8	8.3

Methods with N = 1 are not identified.

* SD was not included for N ≤ 3.

Newborn Screening Quality Assurance Program
UDOT Statistics - Mean Concentration by Method
Year: 2010 Quarter: 2

Specimen No. 0216		Tyr		
		Expected Value 539.41 µmol/L blood		
		N	Mean	SD
Method Code	Method Name			
22	Deriv-MS/MS non-kit	22	469.88	91.71
35	Deriv-MS/MS PE NeoGram MS2 Kit	19	512.11	41.20
60	Non-deriv MS/MS PE NeoBase Kit	6	536.28	22.34

Specimen No. 0216		SUAC		
		Expected Value 10.00 µmol/L blood		
		N	Mean	SD
Method Code	Method Name			
22	Deriv-MS/MS non-kit	14	7.41	4.87
60	Non-deriv MS/MS PE NeoBase Kit	6	3.33	0.52

Specimen No. 0217		C6		
		Expected Value 1.02 µmol/L blood		
		N	Mean	SD
Method Code	Method Name			
22	Deriv-MS/MS non-kit	23	0.87	0.19
35	Deriv-MS/MS PE NeoGram MS2 Kit	20	0.90	0.15
60	Non-deriv MS/MS PE NeoBase Kit	3	0.89	---*

Methods with N = 1 are not identified.

* SD was not included for N ≤ 3.

Newborn Screening Quality Assurance Program
UDOT Statistics - Mean Concentration by Method
Year: 2010 Quarter: 2

Specimen No. 0217		C8		
		Expected Value 2.04 µmol/L blood		
		N	Mean	SD
Method Code	Method Name			
22	Deriv-MS/MS non-kit	25	1.92	0.19
35	Deriv-MS/MS PE NeoGram MS2 Kit	21	1.65	0.29
60	Non-deriv MS/MS PE NeoBase Kit	11	1.70	0.19

Specimen No. 0217		C10		
		Expected Value 1.05 µmol/L blood		
		N	Mean	SD
Method Code	Method Name			
22	Deriv-MS/MS non-kit	23	0.96	0.16
35	Deriv-MS/MS PE NeoGram MS2 Kit	20	0.73	0.09
60	Non-deriv MS/MS PE NeoBase Kit	8	0.79	0.08

Specimen No. 0217		C10:1		
		Expected Value 1.19 µmol/L blood		
		N	Mean	SD
Method Code	Method Name			
22	Deriv-MS/MS non-kit	21	1.26	0.23
35	Deriv-MS/MS PE NeoGram MS2 Kit	19	1.12	0.15
60	Non-deriv MS/MS PE NeoBase Kit	10	0.93	0.15

Methods with N = 1 are not identified.

* SD was not included for N ≤ 3.

Newborn Screening Quality Assurance Program
UDOT Statistics - Mean Concentration by Method
Year: 2010 Quarter: 2

Specimen No. 0218		C5		
		Expected Value 1.09 µmol/L blood		
		N	Mean	SD
Method Code	Method Name			
22	Deriv-MS/MS non-kit	22	1.08	0.14
35	Deriv-MS/MS PE NeoGram MS2 Kit	20	1.03	0.13
60	Non-deriv MS/MS PE NeoBase Kit	10	1.11	0.08

Specimen No. 0219		Met		
		Expected Value 348.98 µmol/L blood		
		N	Mean	SD
Method Code	Method Name			
22	Deriv-MS/MS non-kit	22	339.92	46.48
35	Deriv-MS/MS PE NeoGram MS2 Kit	20	371.05	33.91
60	Non-deriv MS/MS PE NeoBase Kit	11	351.76	29.55

Specimen No. 0220		C14		
		Expected Value 1.60 µmol/L blood		
		N	Mean	SD
Method Code	Method Name			
22	Deriv-MS/MS non-kit	22	1.42	0.21
35	Deriv-MS/MS PE NeoGram MS2 Kit	18	1.24	0.10
60	Non-deriv MS/MS PE NeoBase Kit	10	1.28	0.05

Methods with N = 1 are not identified.

* SD was not included for N ≤ 3.

Newborn Screening Quality Assurance Program
UDOT Statistics - Mean Concentration by Method
Year: 2010 Quarter: 2

Specimen No. 0220		C14:1		
		Expected Value 1.38 µmol/L blood		
		N	Mean	SD
Method Code	Method Name			
22	Deriv-MS/MS non-kit	25	1.31	0.19
35	Deriv-MS/MS PE NeoGram MS2 Kit	21	1.43	0.15
60	Non-deriv MS/MS PE NeoBase Kit	11	1.14	0.10

Specimen No. 0221		17-OHP		
		Expected Value 80.7 ng/mL serum		
		N	Mean	SD
Method Code	Method Name			
10	Delfia	2	86.9	---*
21	AutoDelfia	28	109.8	20.5
53	LC-MS/MS	2	97.7	---*
58	AutoDelfia Neonatal 17-OHP (B024)	15	97.0	14.0

Specimen No. 0222		C0(high)		
		Expected Value 117.27 µmol/L blood		
		N	Mean	SD
Method Code	Method Name			
22	Deriv-MS/MS non-kit	14	78.74	7.46
35	Deriv-MS/MS PE NeoGram MS2 Kit	2	100.77	---*

Methods with N = 1 are not identified.

* SD was not included for N ≤ 3.

Newborn Screening Quality Assurance Program
UDOT Statistics - Mean Concentration by Method
Year: 2010 Quarter: 2

Specimen No. 0223		C4OH		
		Expected Value 1.79 µmol/L blood		
		N	Mean	SD
Method Code	Method Name			
22	Deriv-MS/MS non-kit	16	1.37	0.38
35	Deriv-MS/MS PE NeoGram MS2 Kit	9	1.54	0.38

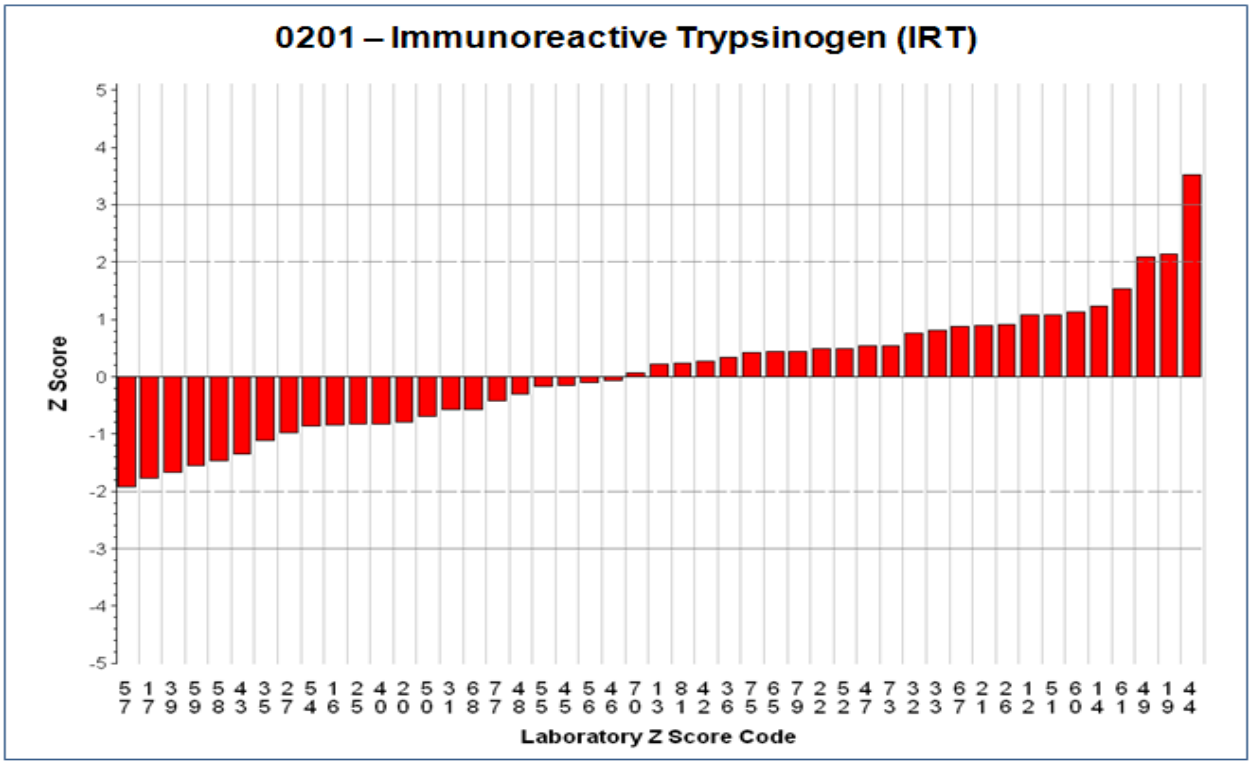
Specimen No. 0224		C16OH		
		Expected Value 0.74 µmol/L blood		
		N	Mean	SD
Method Code	Method Name			
22	Deriv-MS/MS non-kit	23	0.59	0.08
35	Deriv-MS/MS PE NeoGram MS2 Kit	21	0.60	0.11
60	Non-deriv MS/MS PE NeoBase Kit	10	0.50	0.06

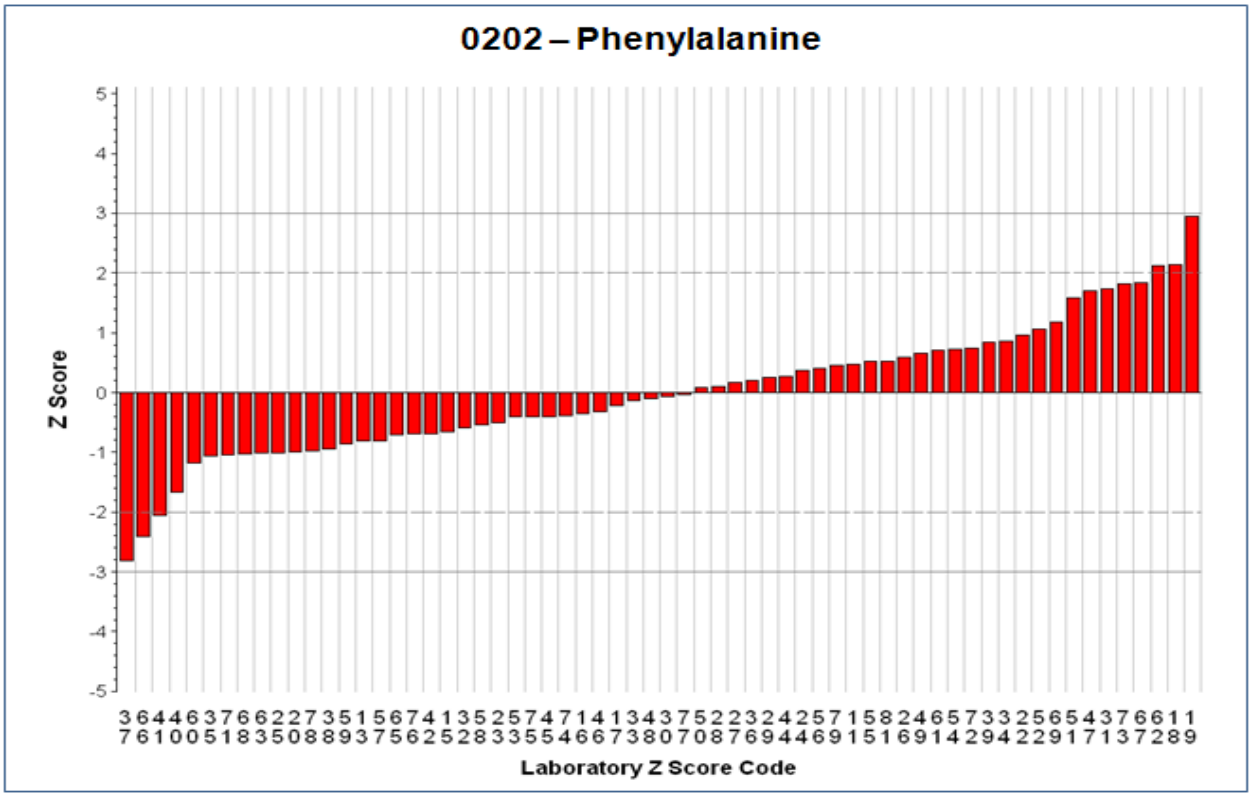
Specimen No. 0225		Arg		
		Expected Value 63.85 µmol/L blood		
		N	Mean	SD
Method Code	Method Name			
22	Deriv-MS/MS non-kit	15	77.89	38.51
35	Deriv-MS/MS PE NeoGram MS2 Kit	13	199.98	17.87
60	Non-deriv MS/MS PE NeoBase Kit	7	220.64	29.73

Methods with N = 1 are not identified.

* SD was not included for N ≤ 3.

UDOT Z Scores Quarter 2, 2010





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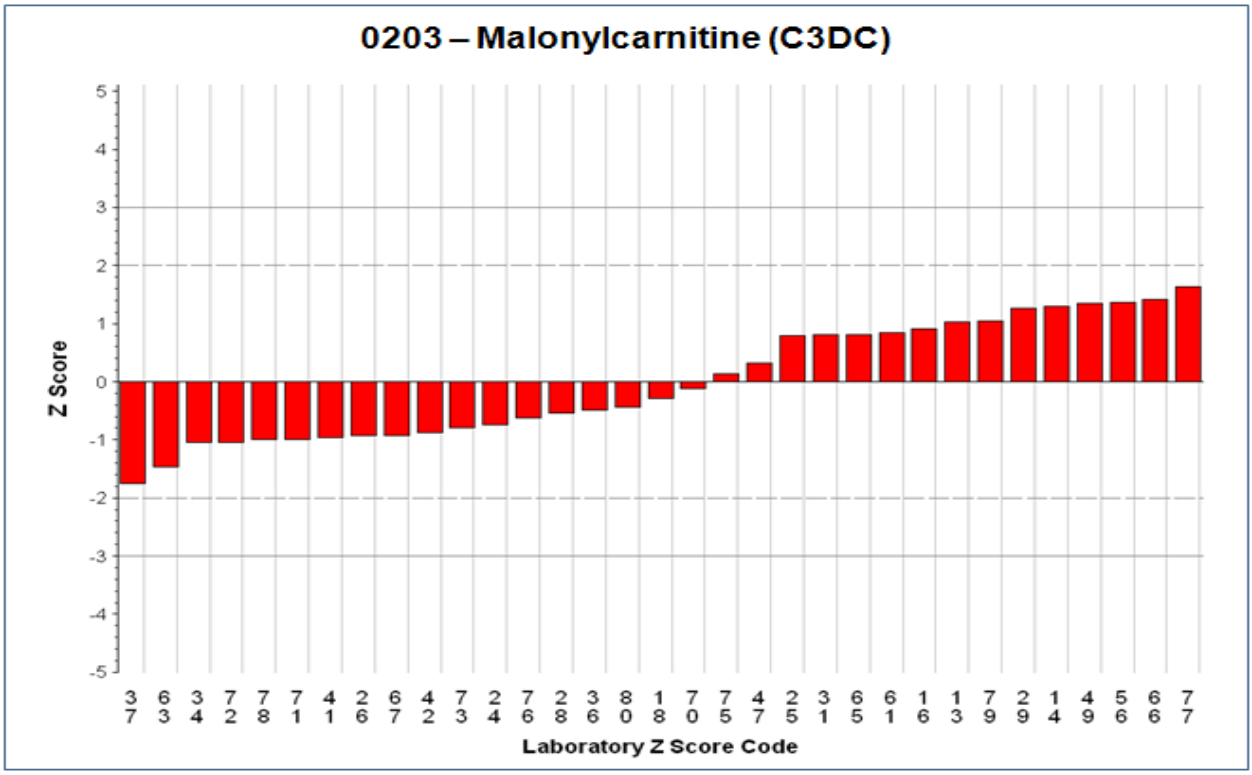
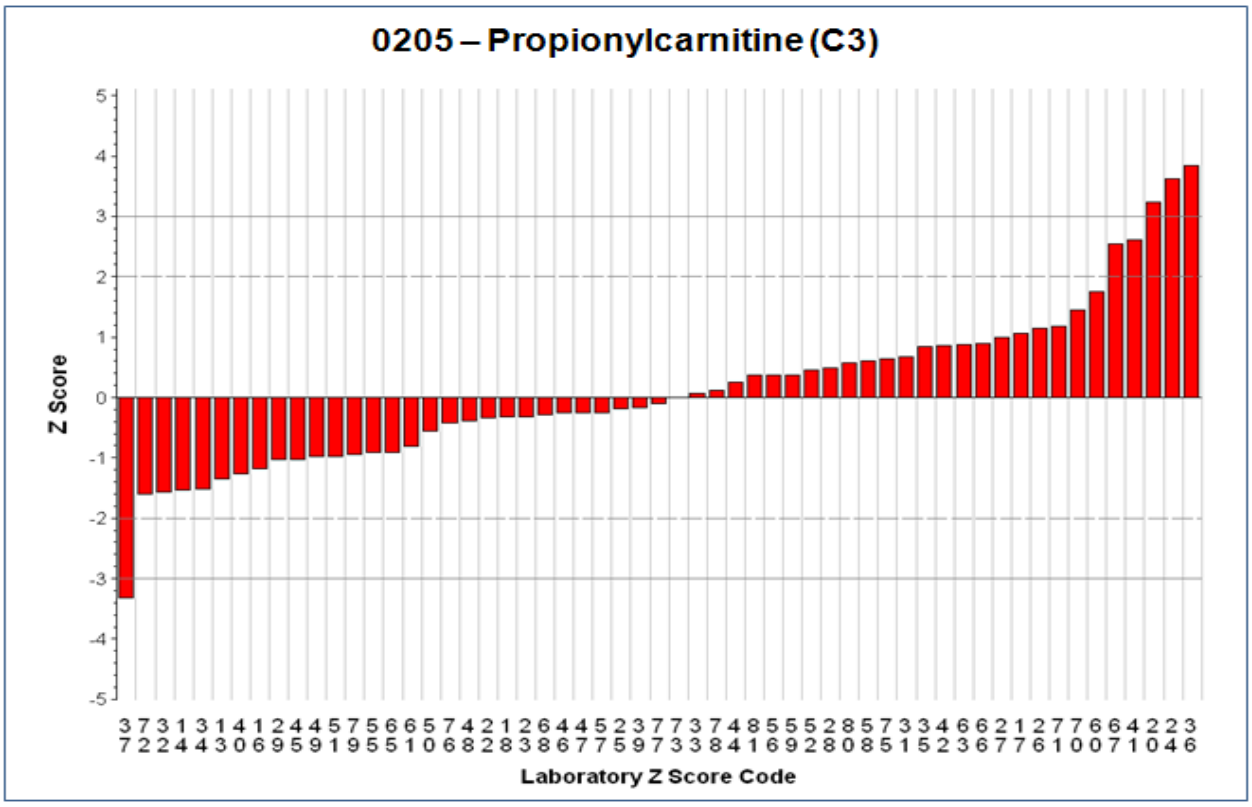
UDOT Z Scores Quarter 2, 2010





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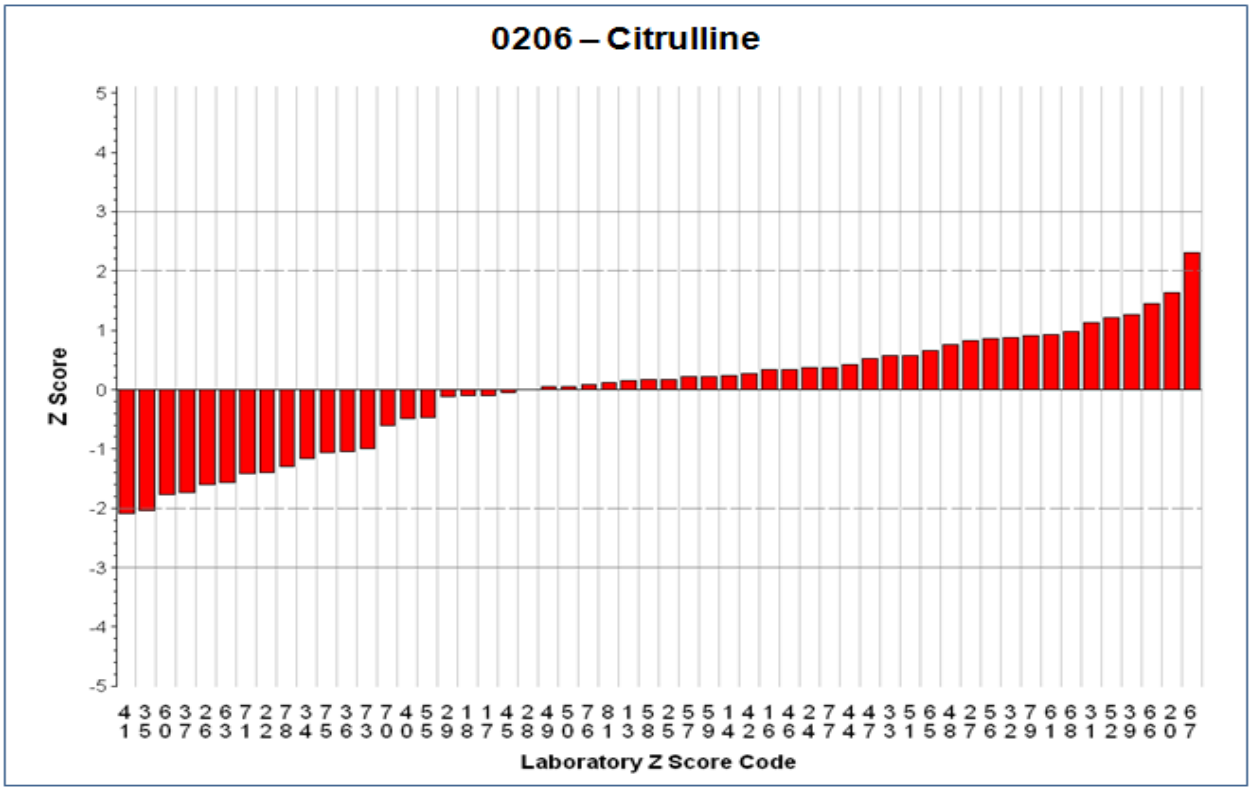
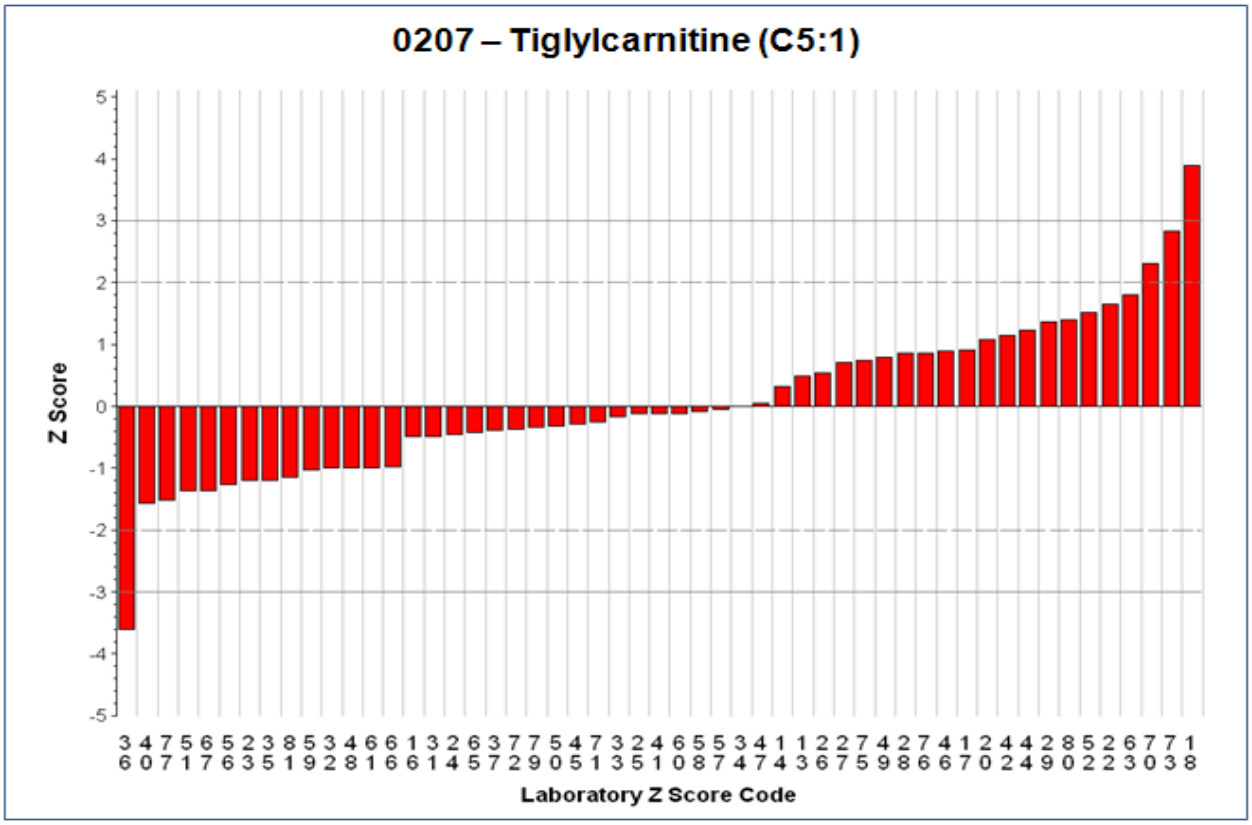
UDOT Z Scores Quarter 2, 2010





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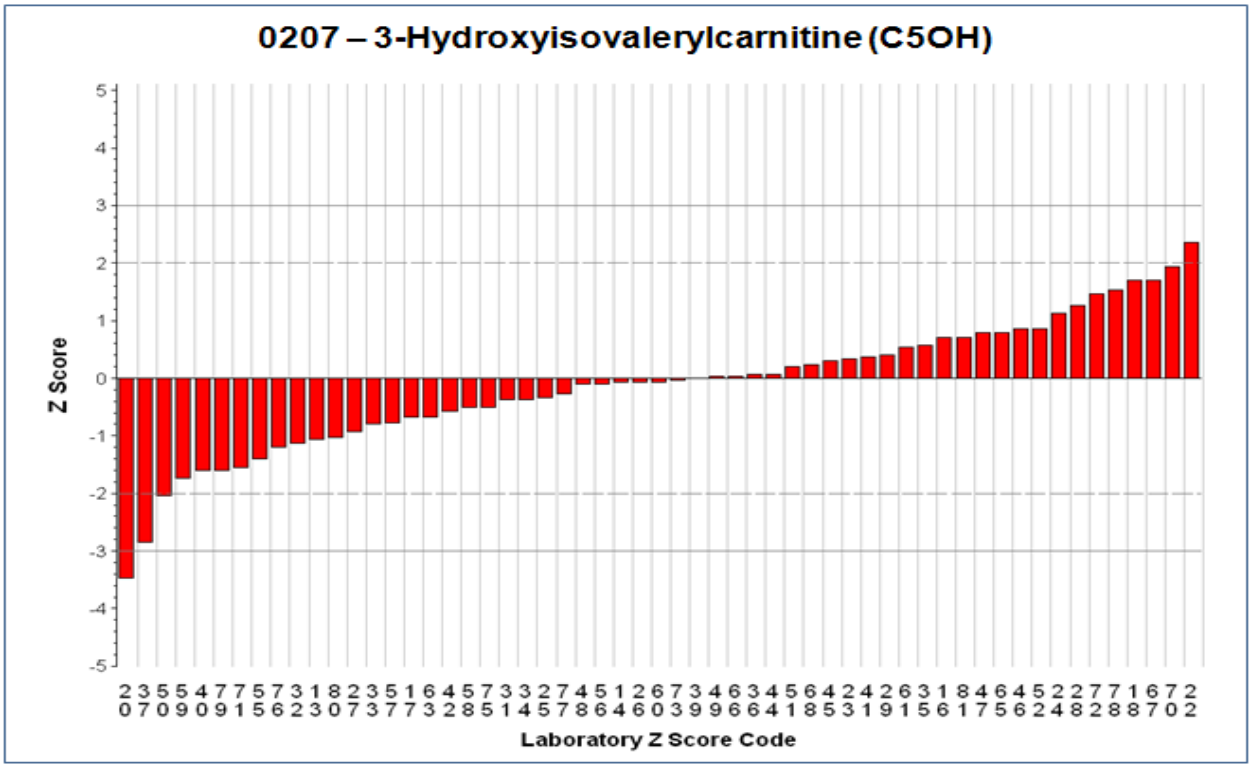
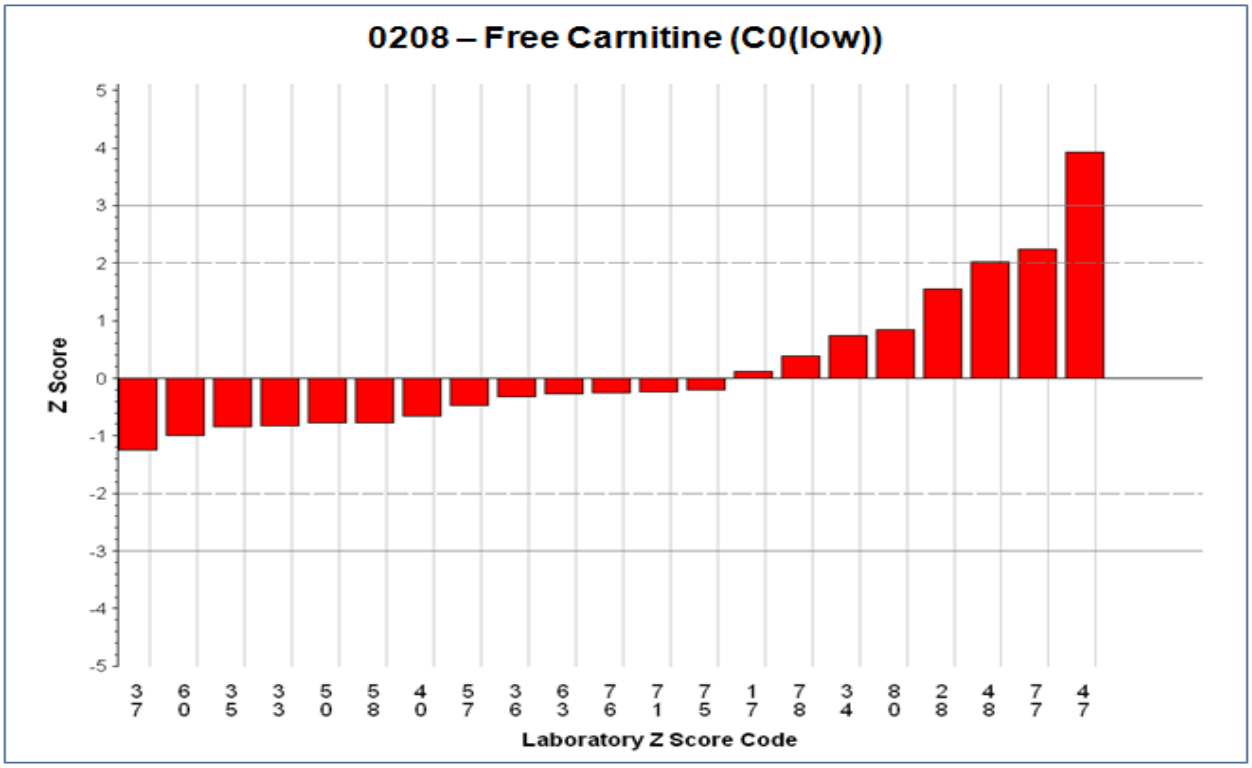
UDOT Z Scores Quarter 2, 2010





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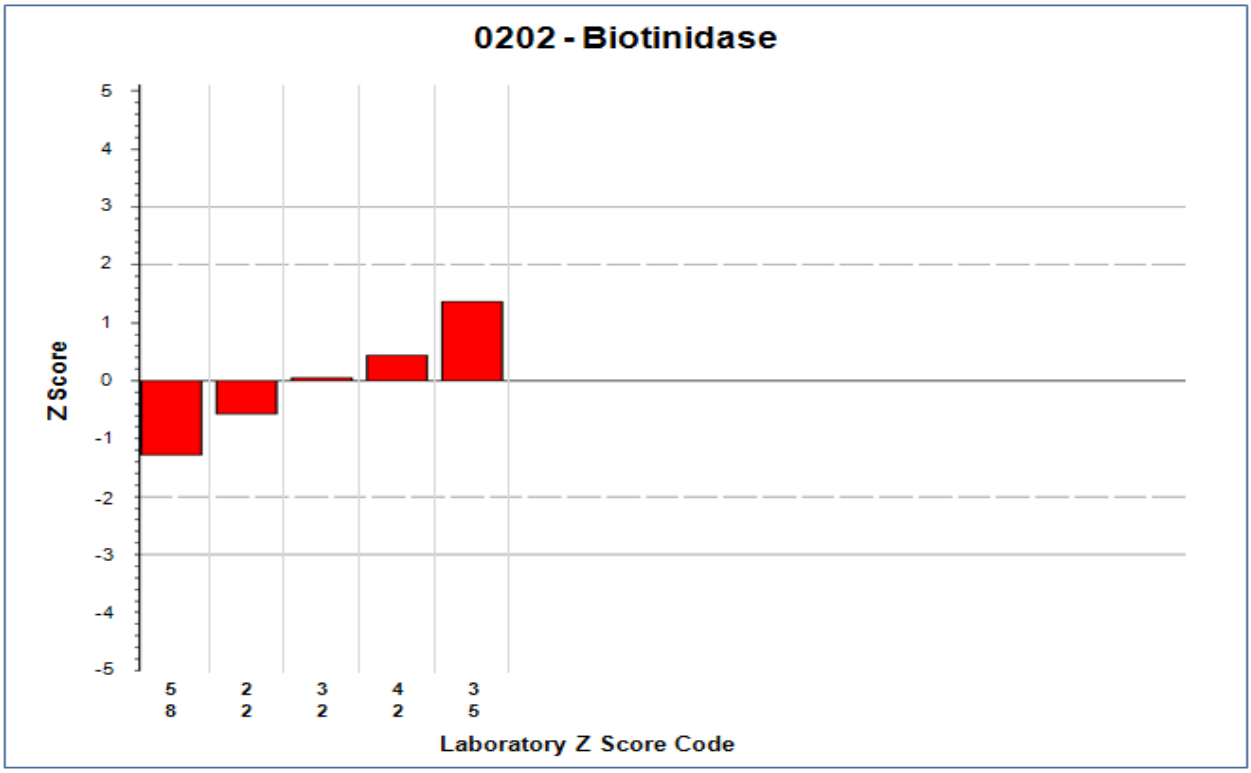
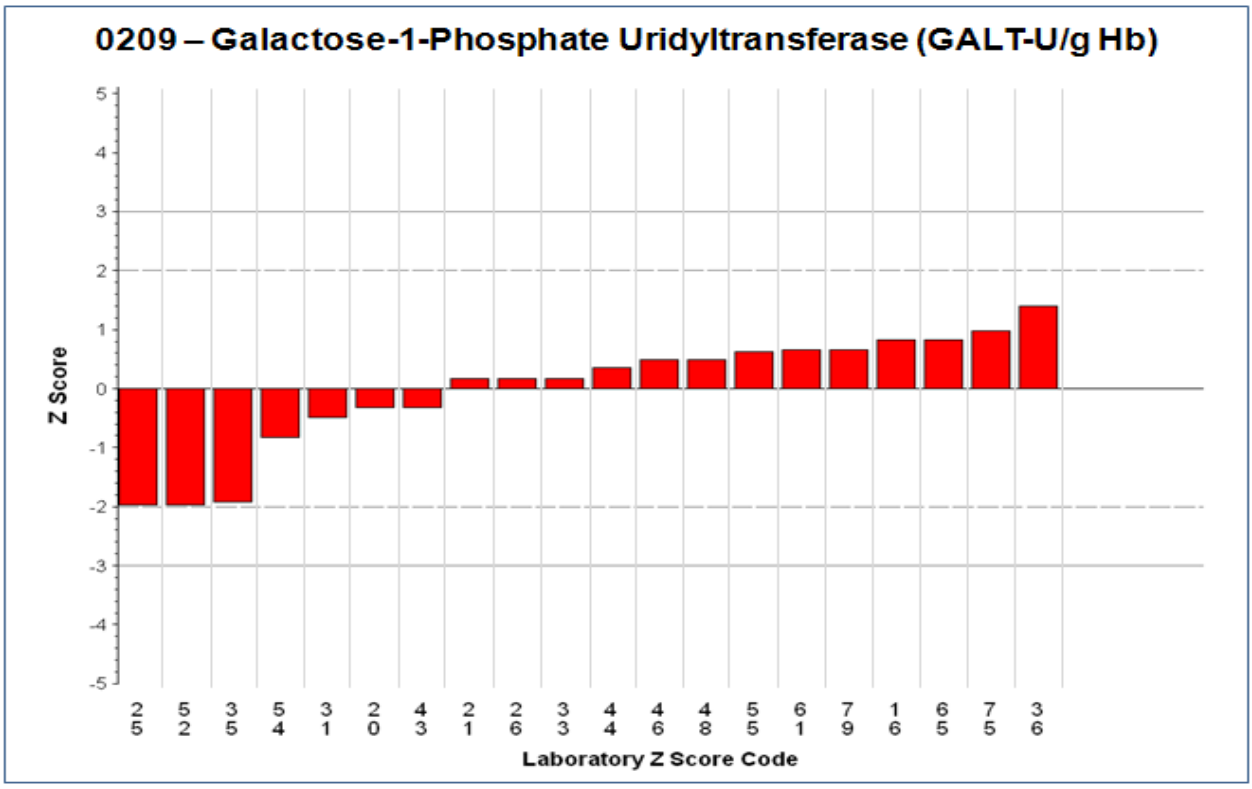
UDOT Z Scores Quarter 2, 2010





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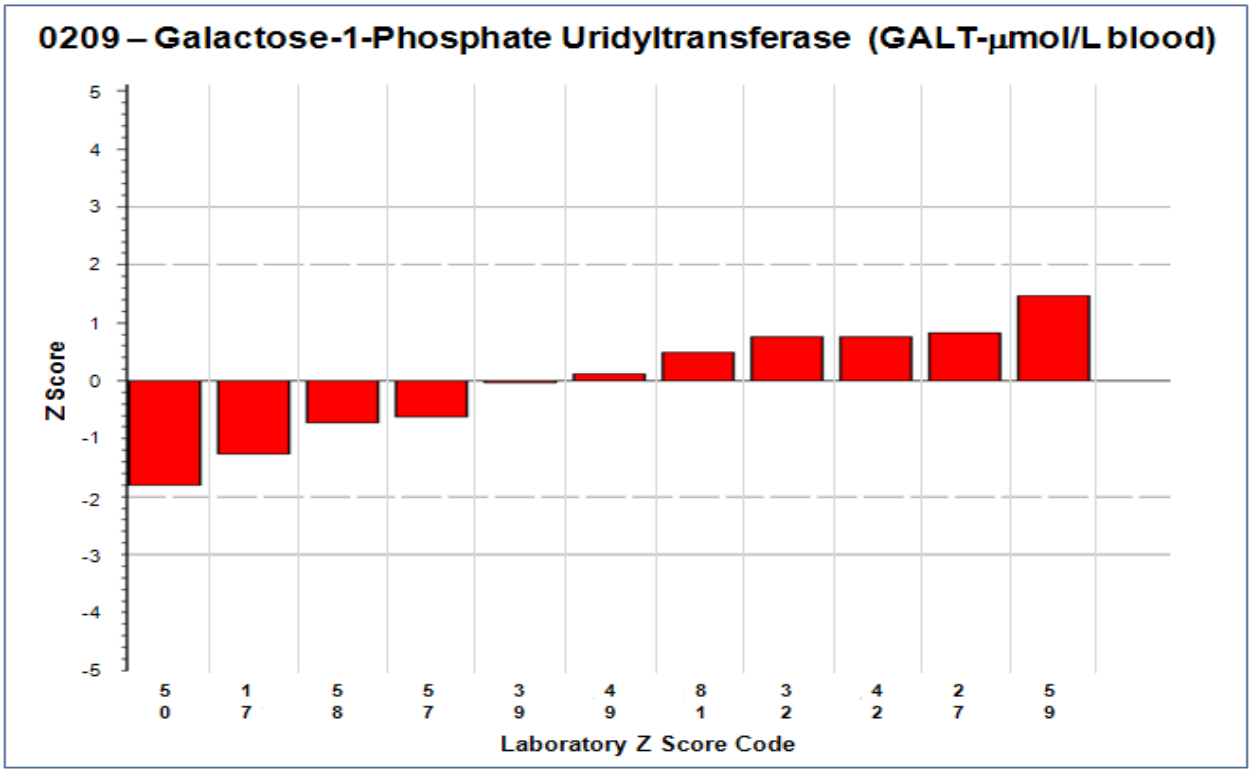

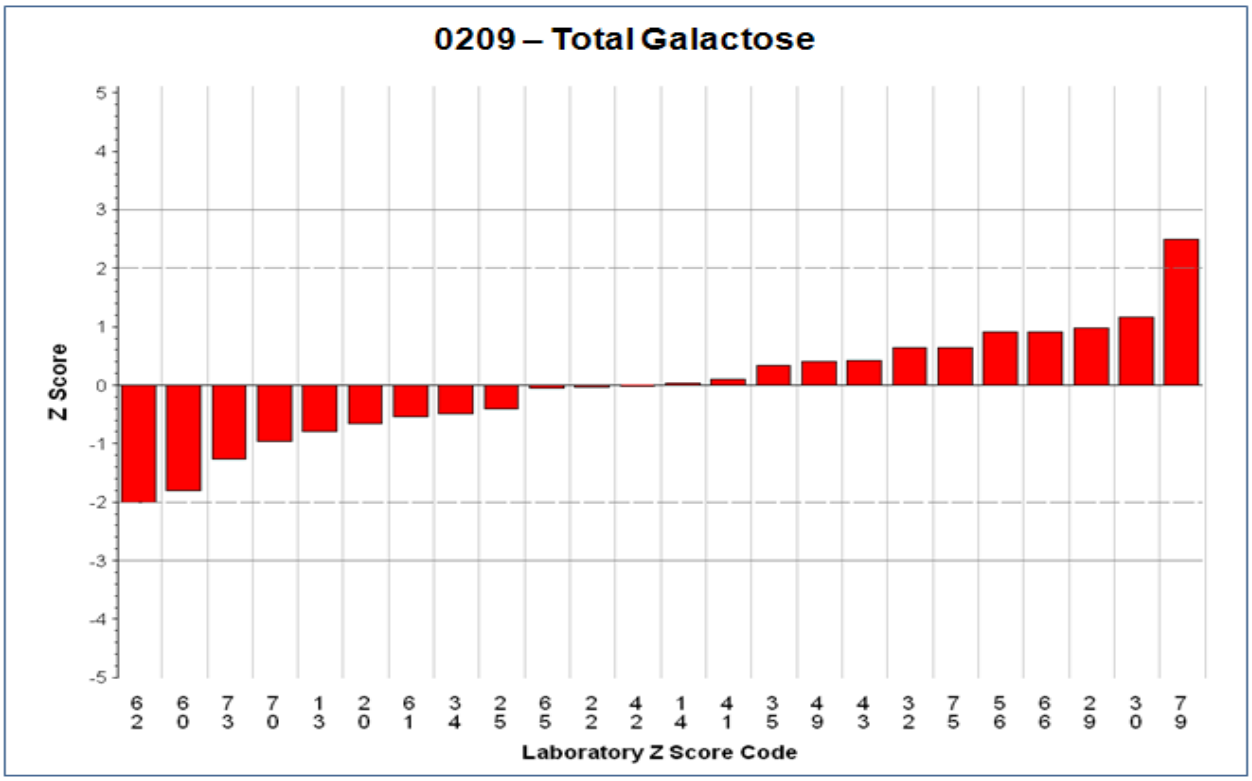

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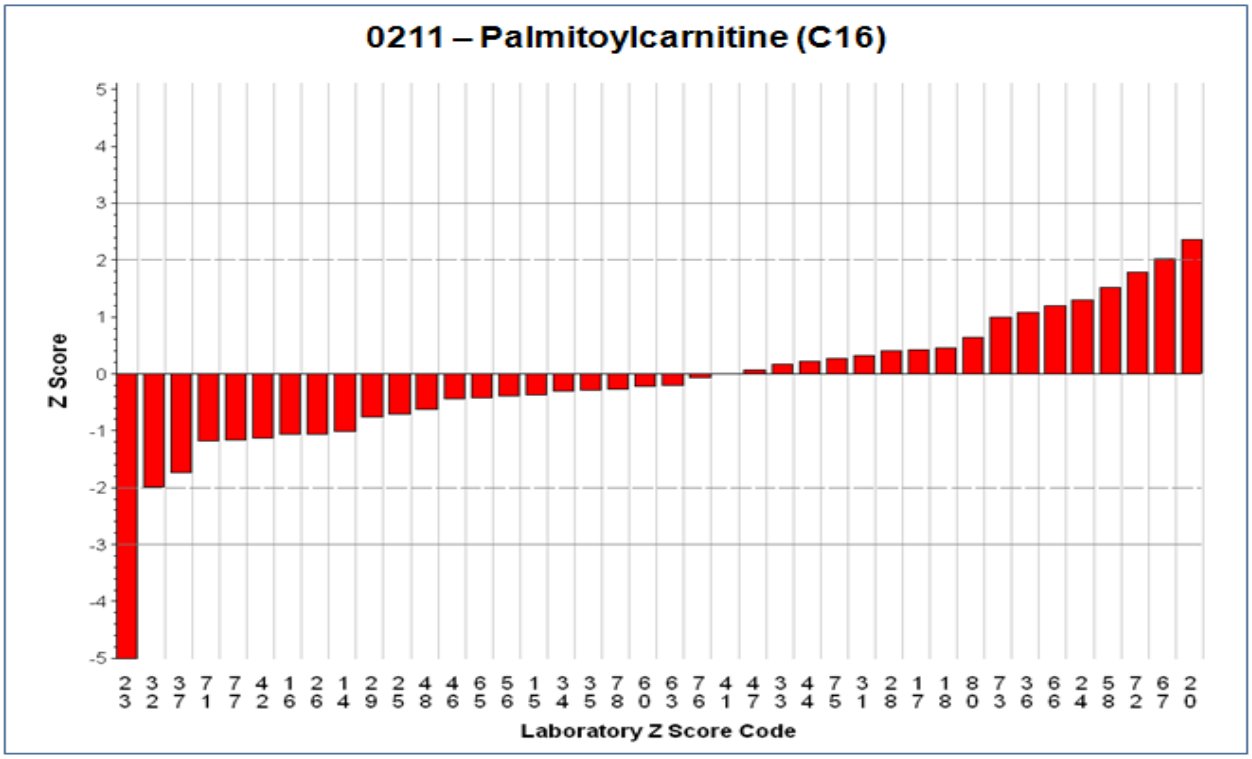

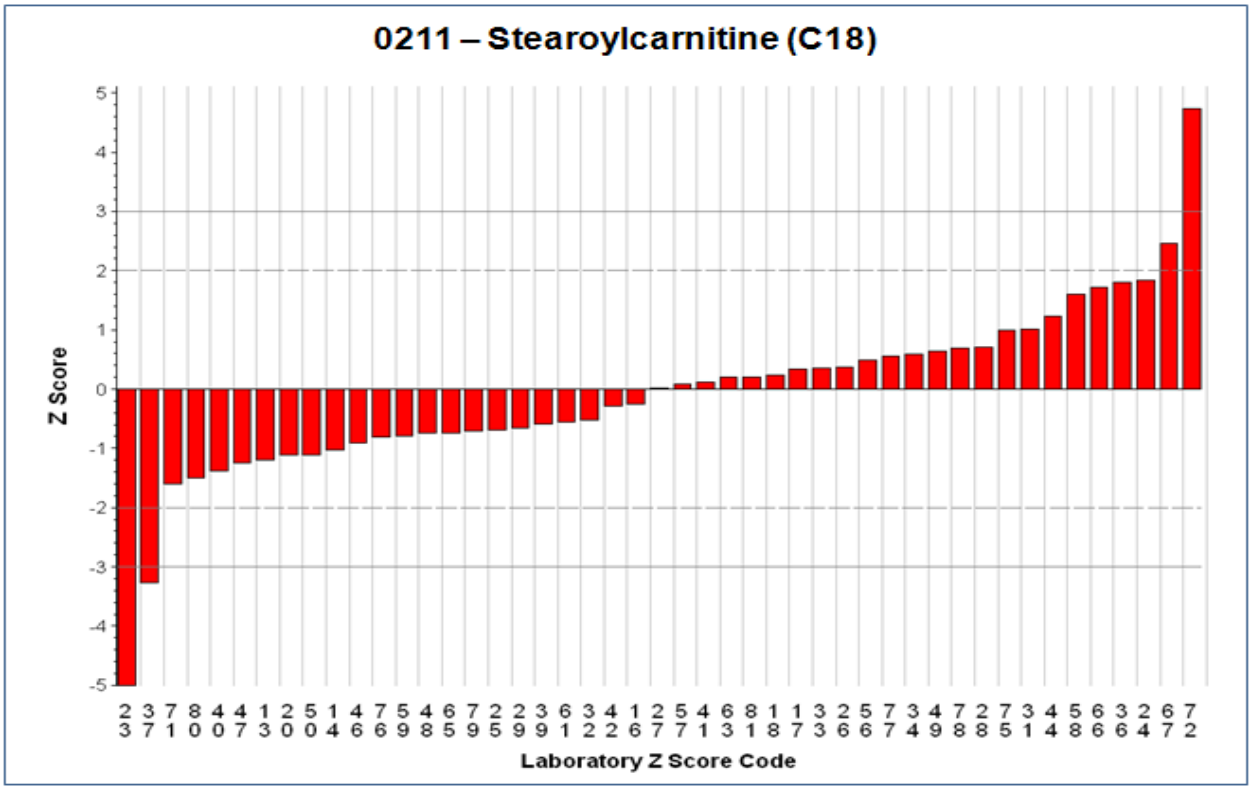

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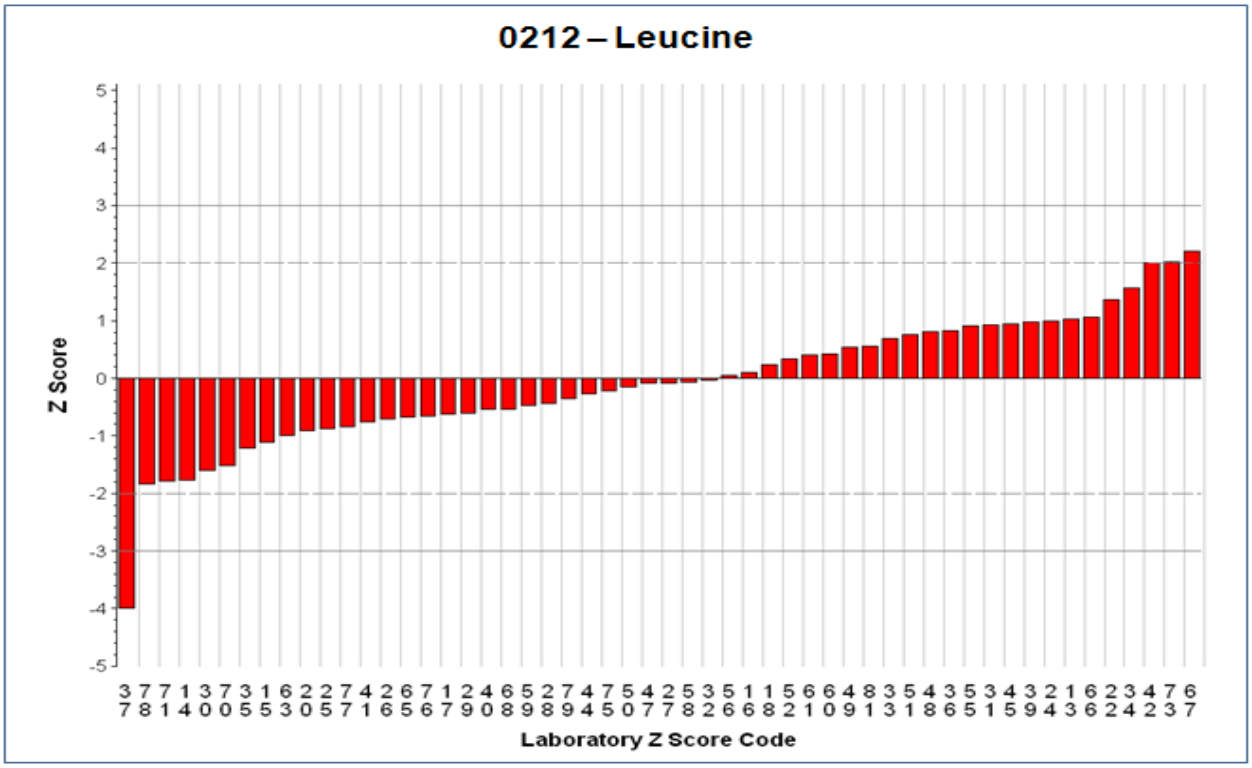

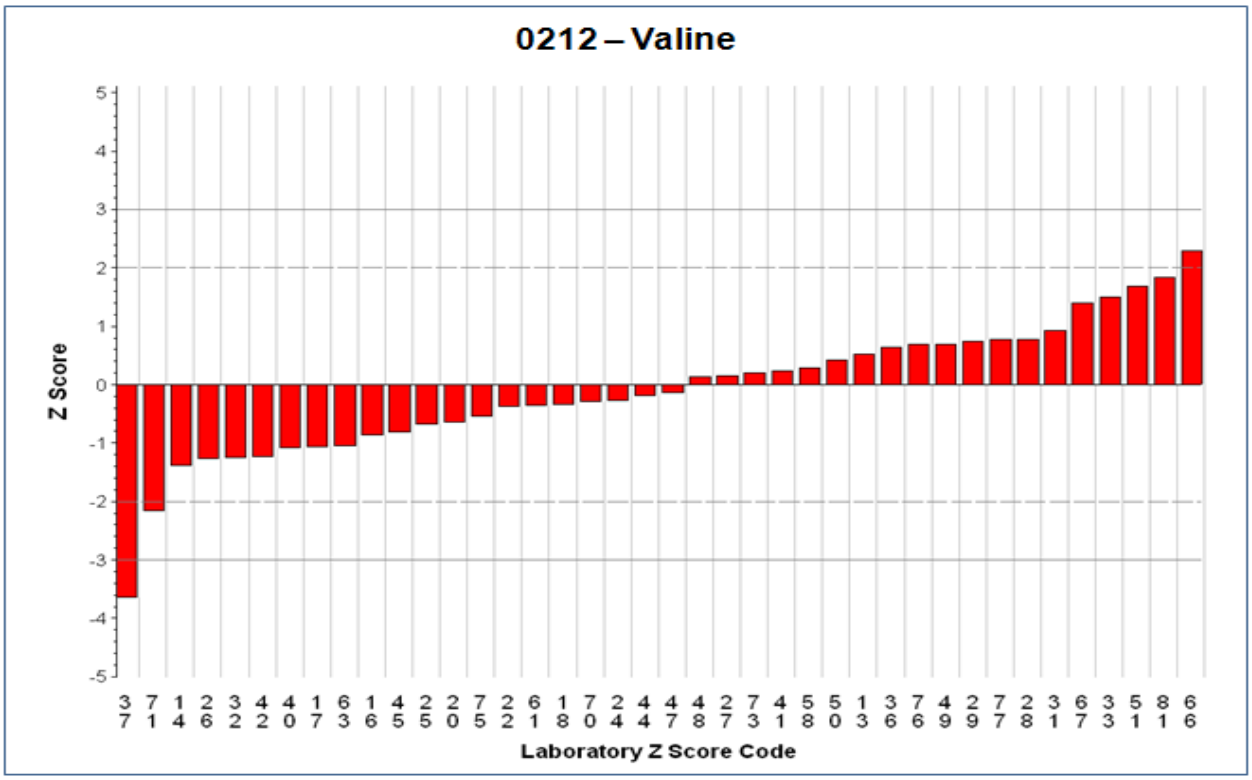

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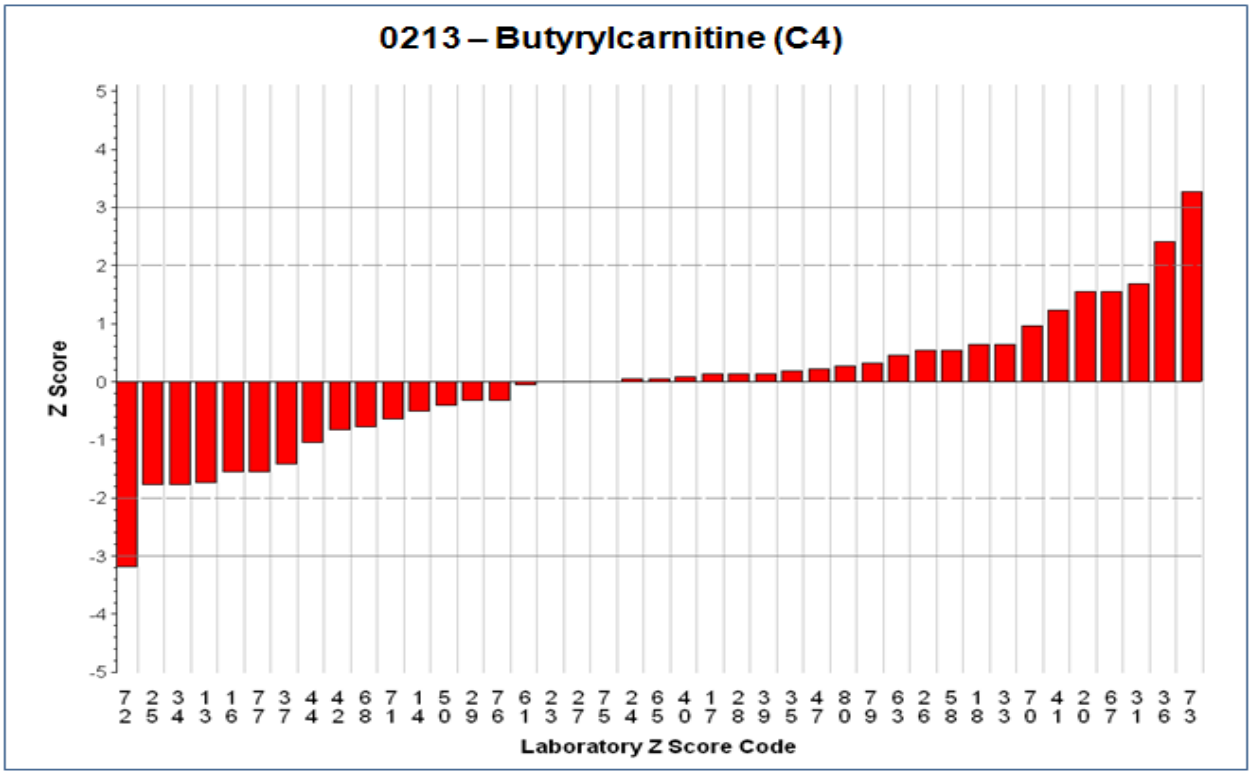

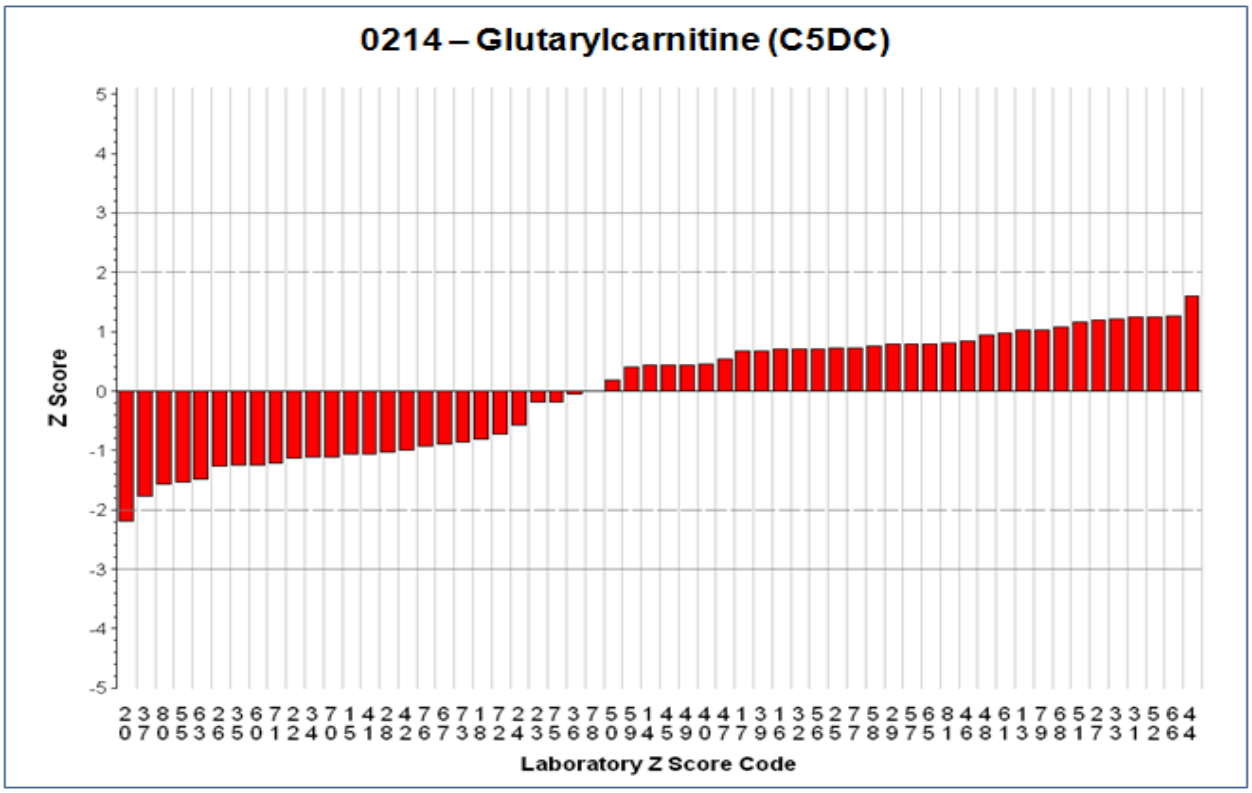

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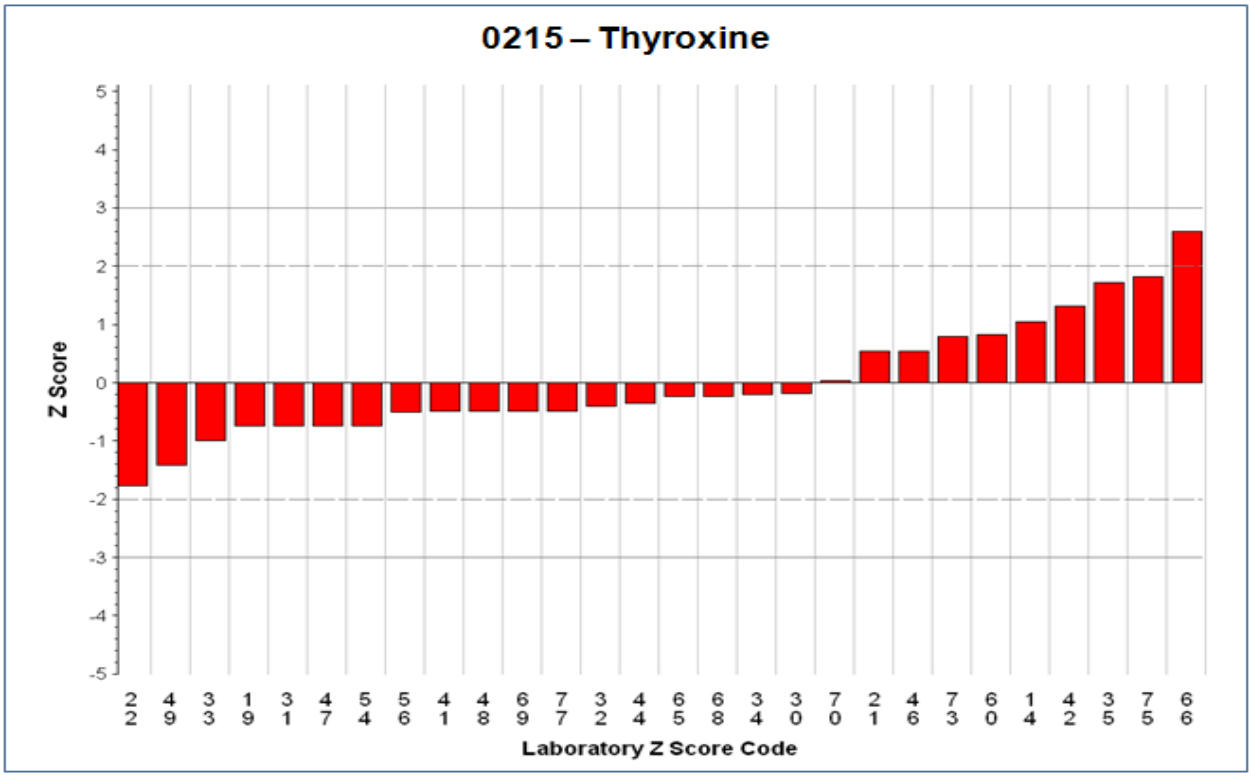

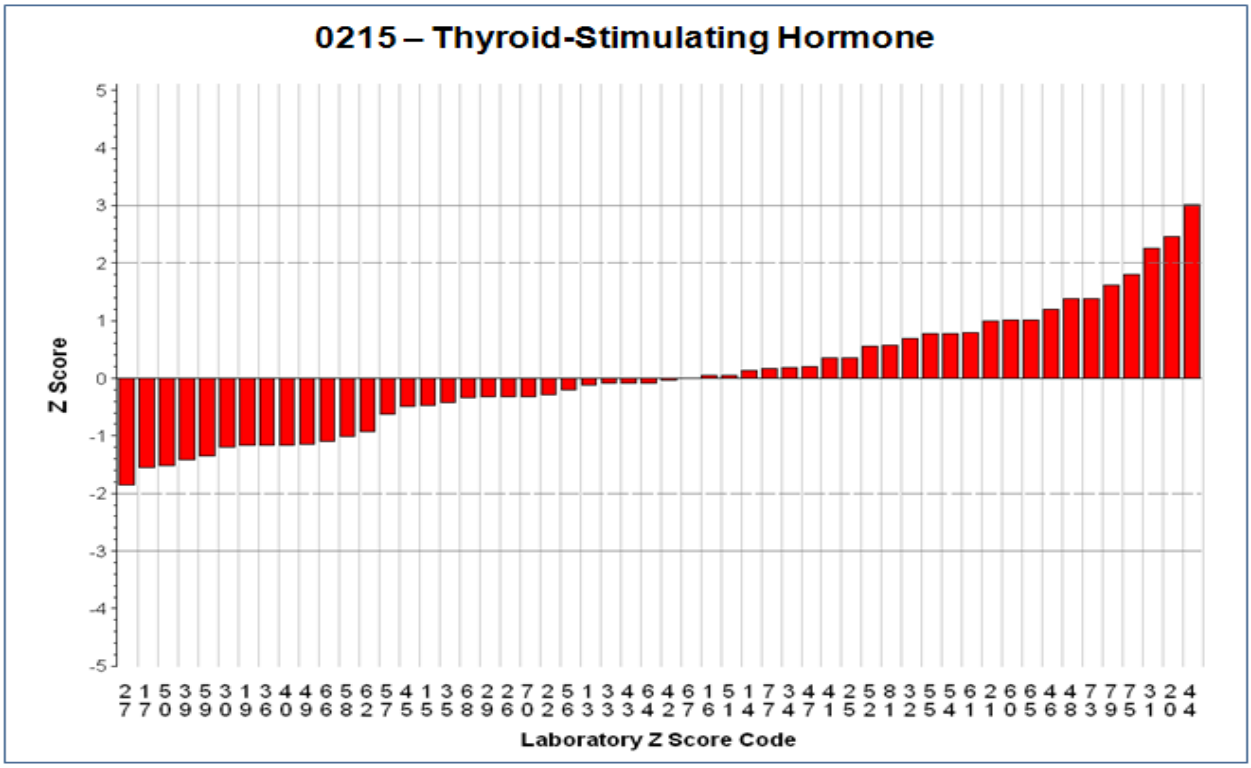

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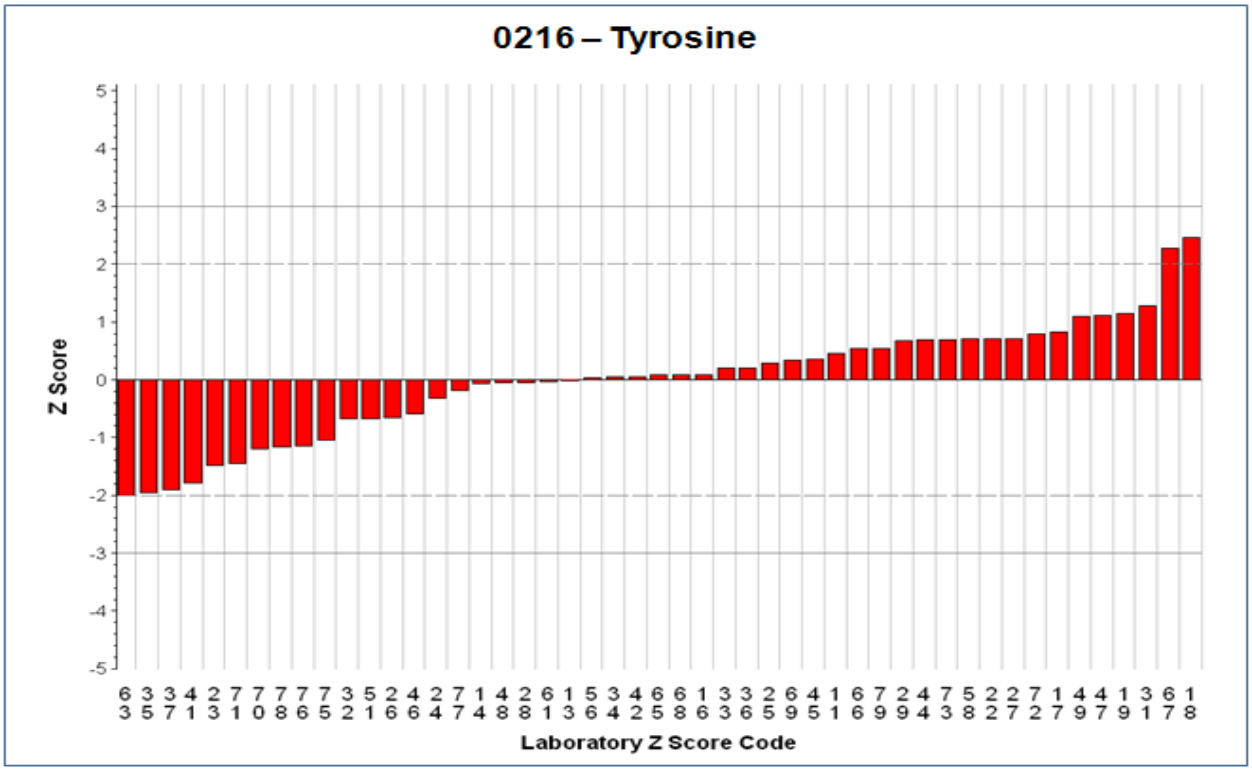

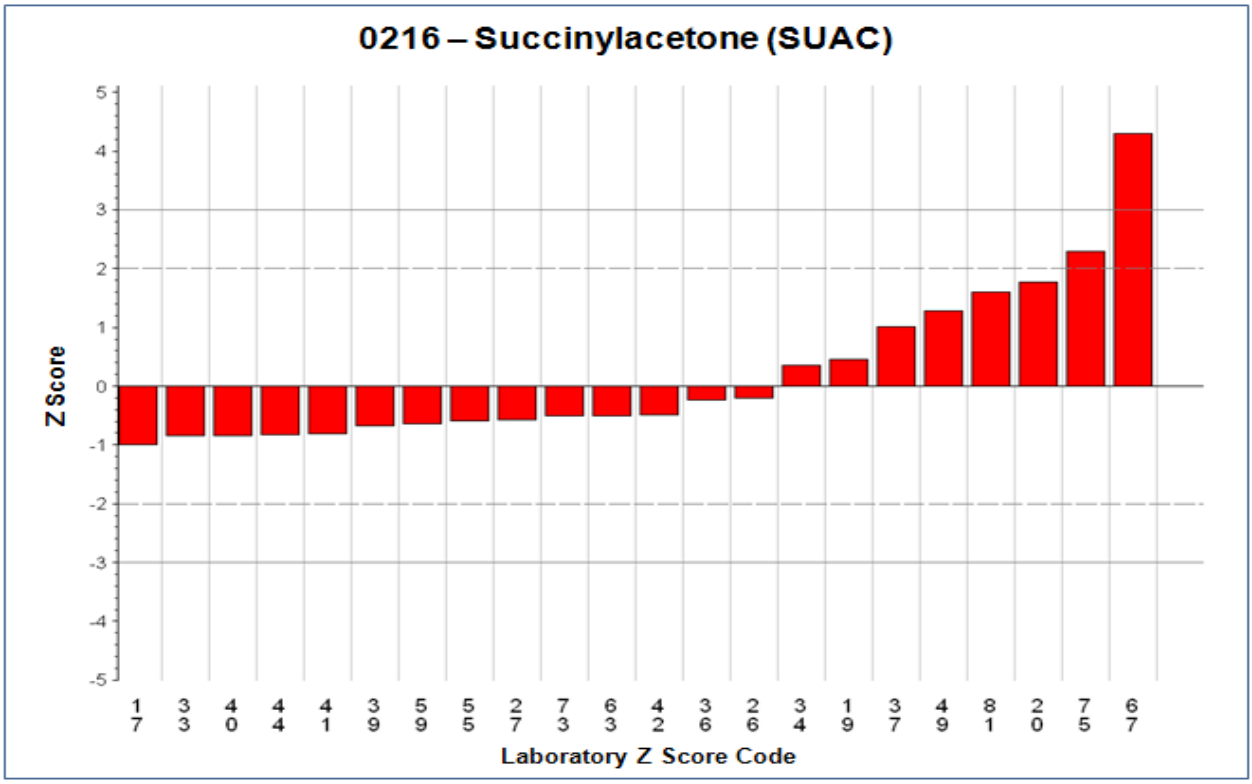

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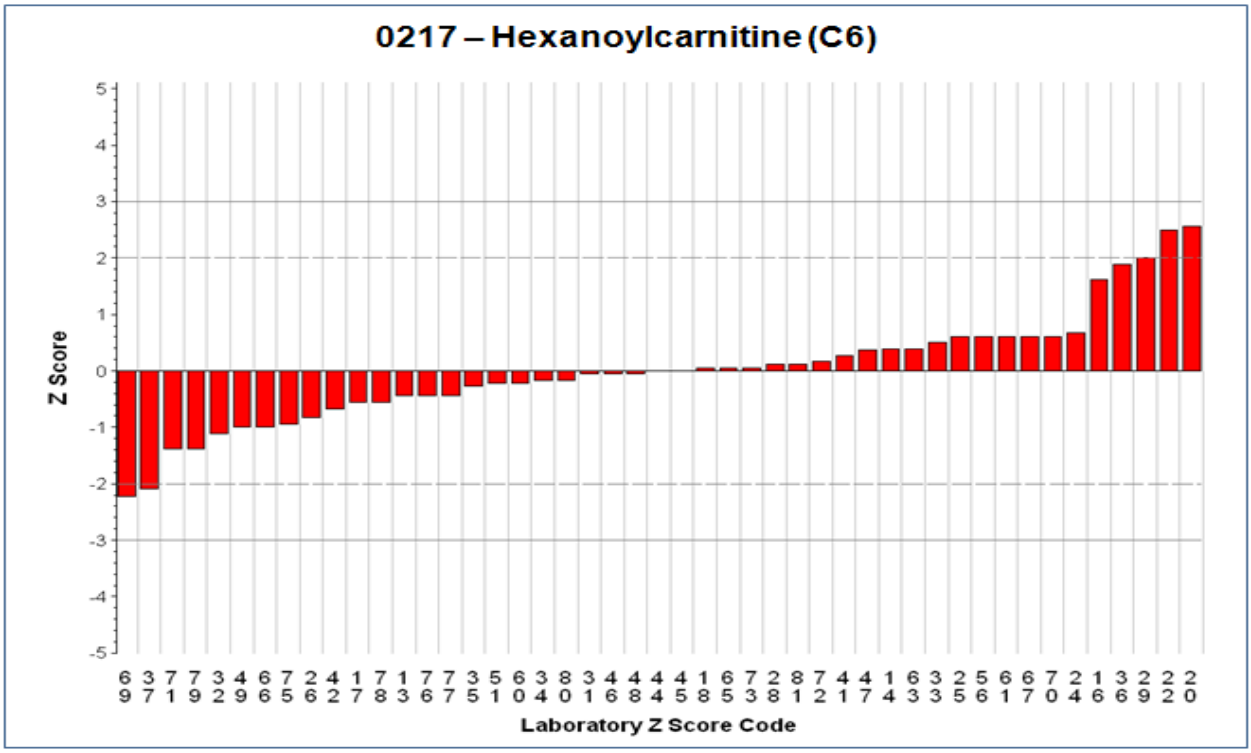

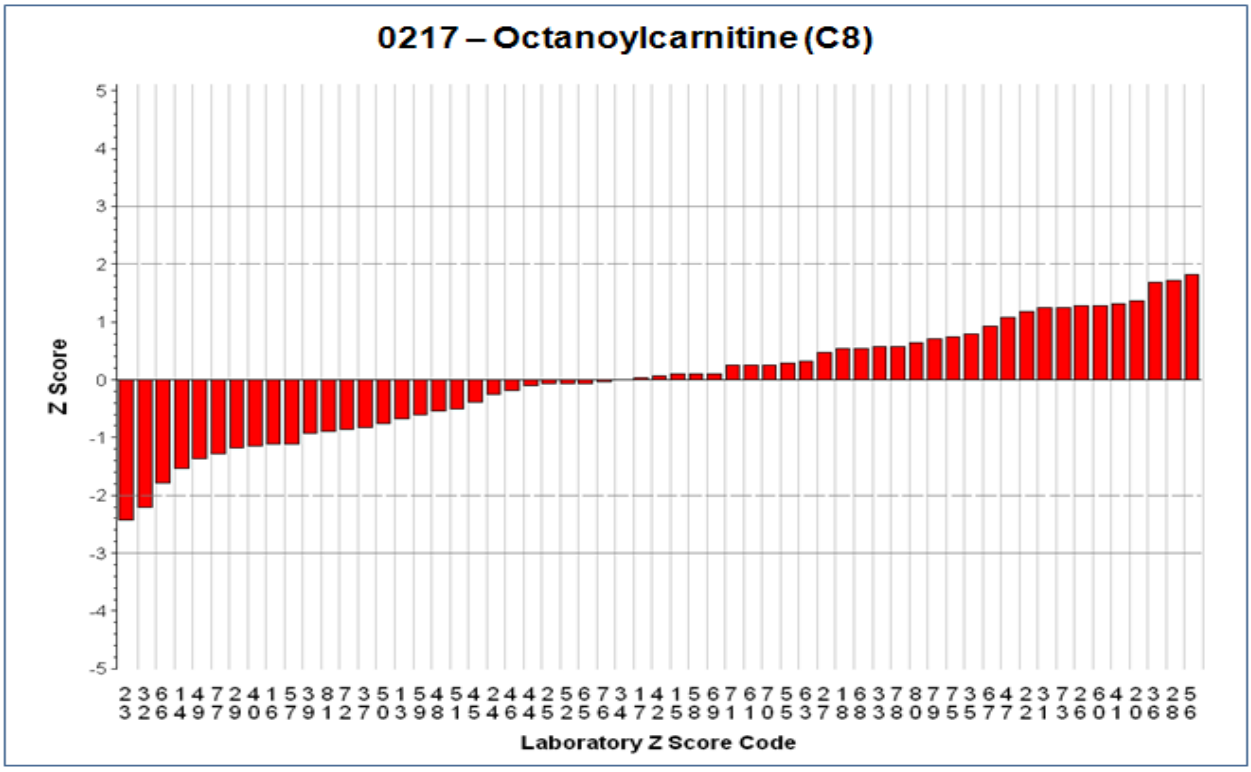

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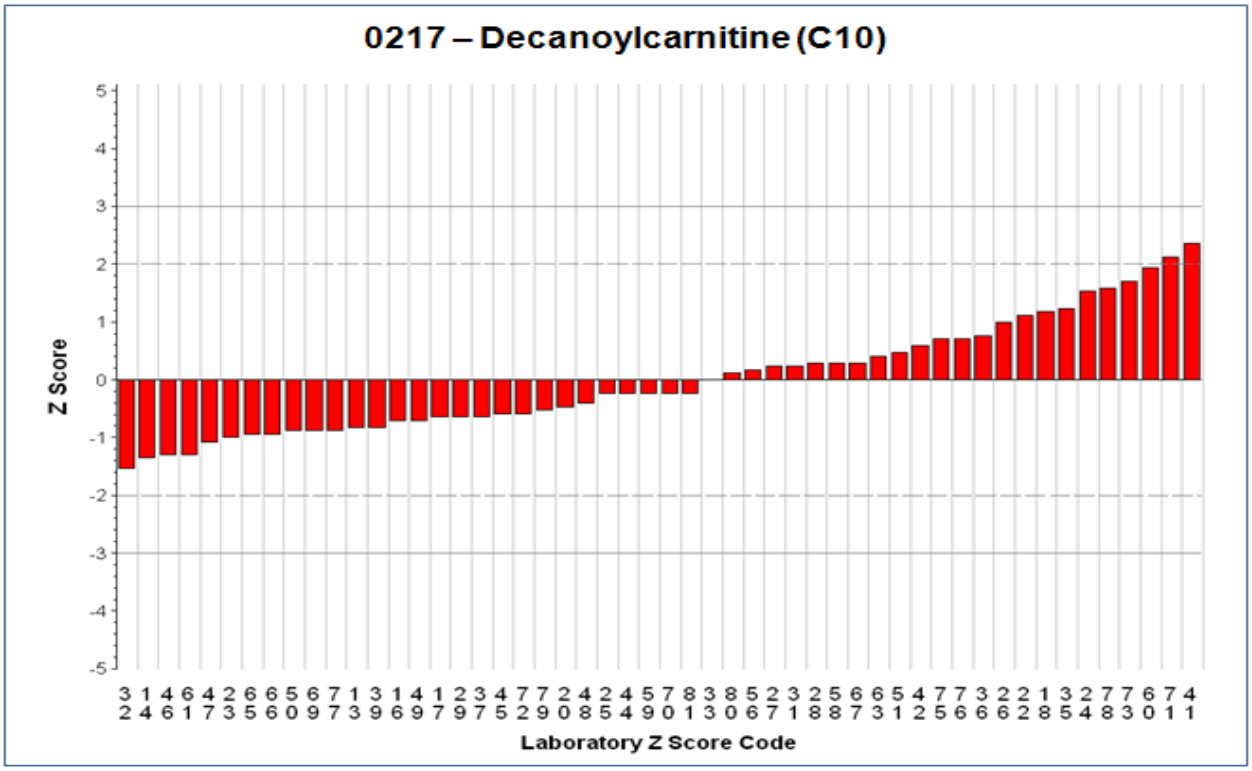
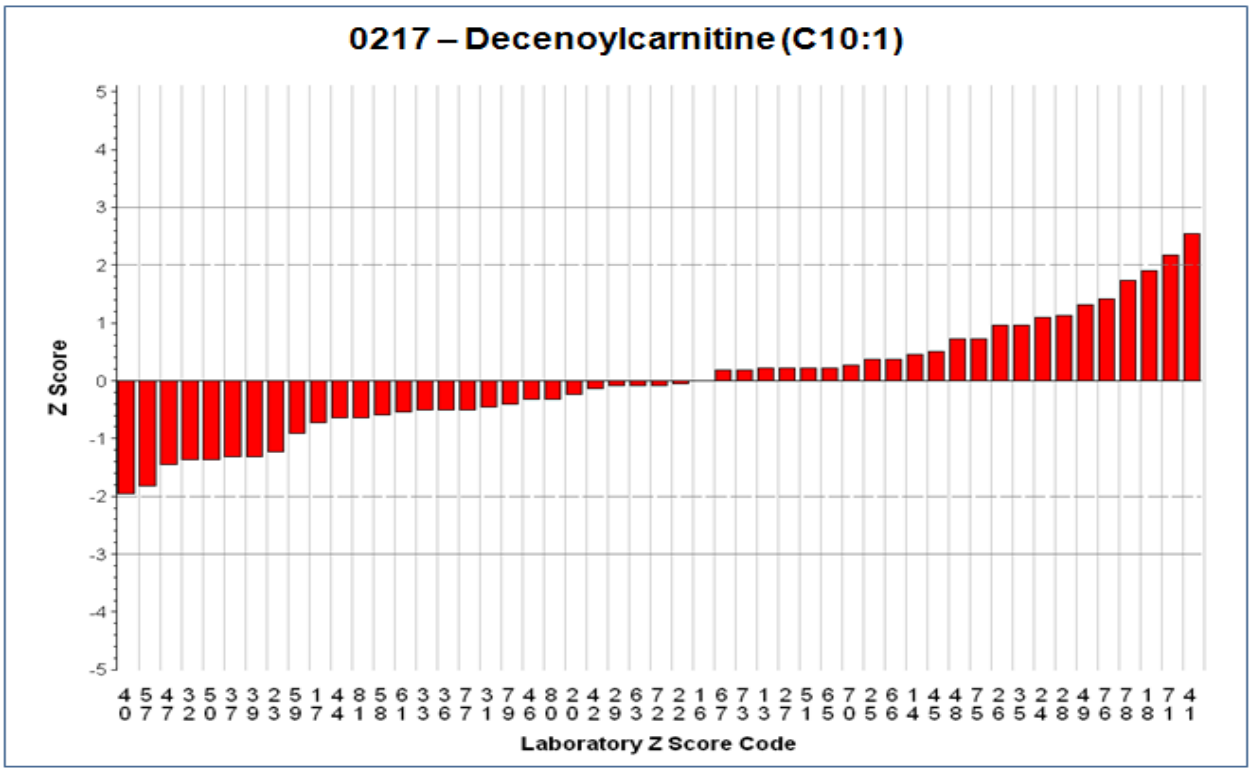
UDOT Z Scores Quarter 2, 2010





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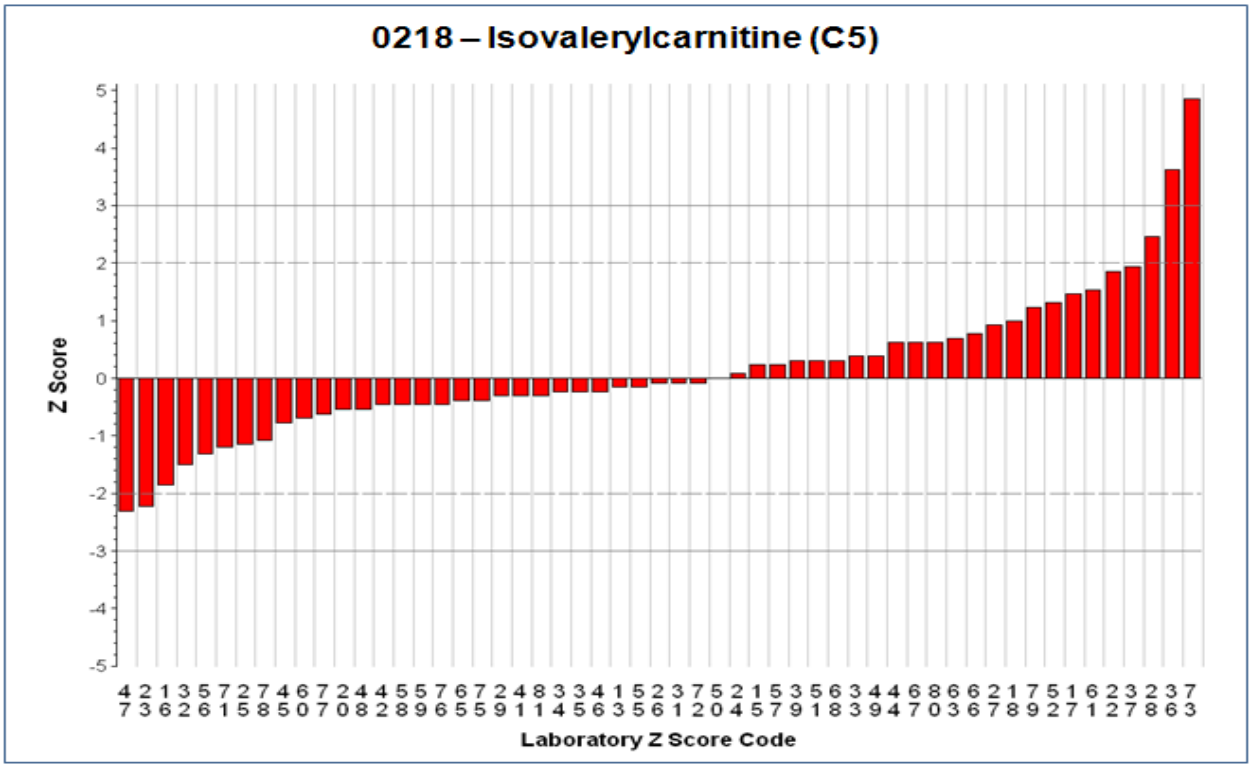
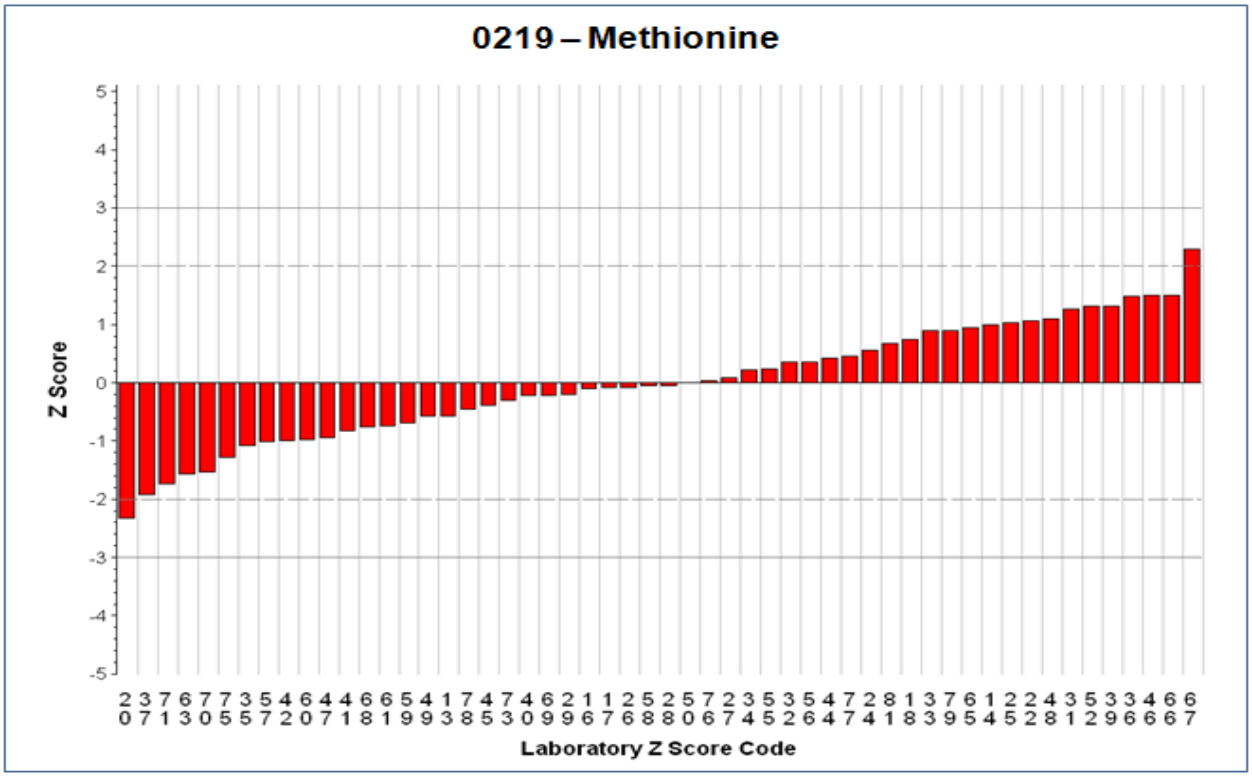
UDOT Z Scores Quarter 2, 2010





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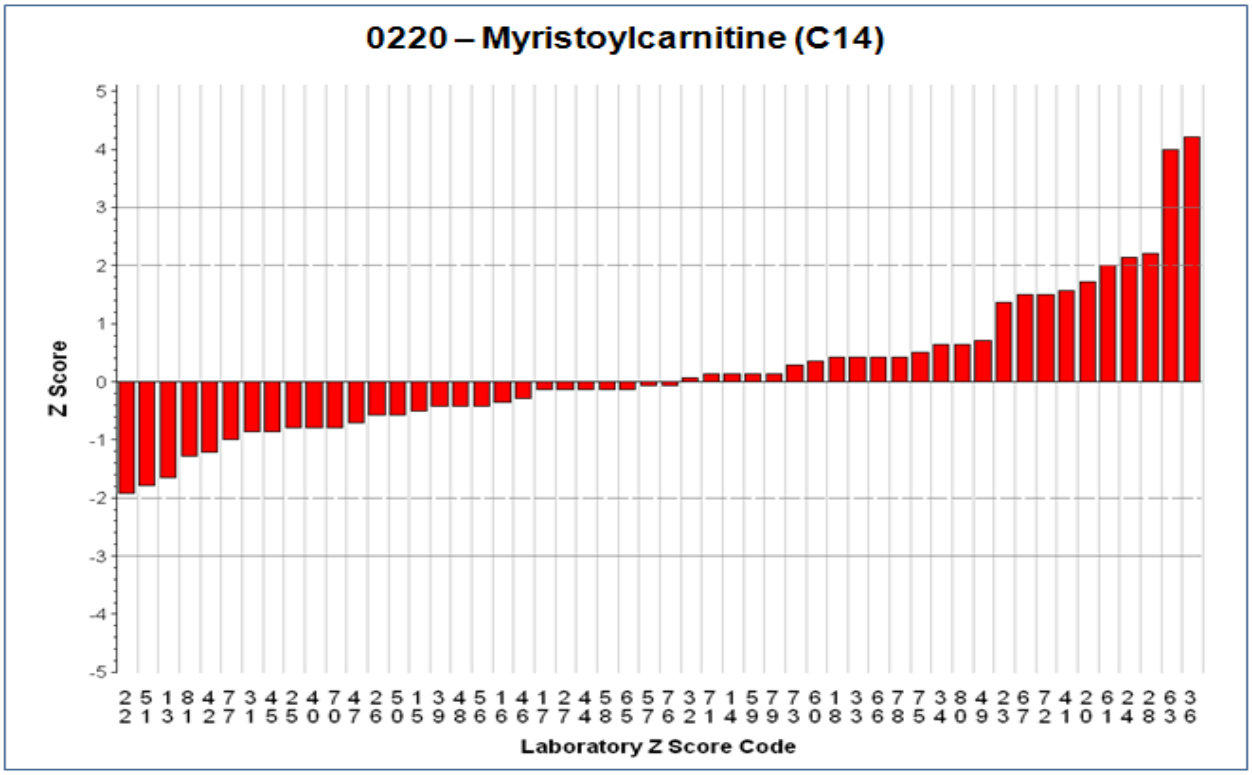
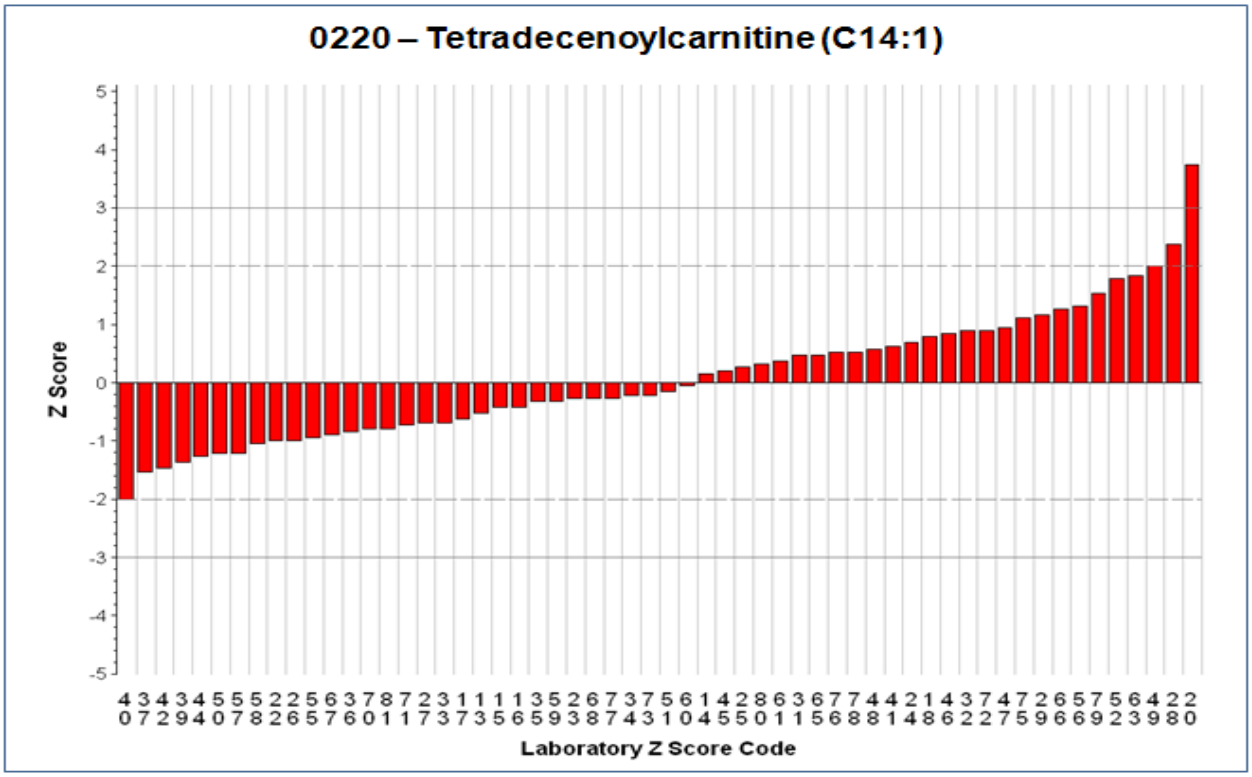
UDOT Z Scores Quarter 2, 2010





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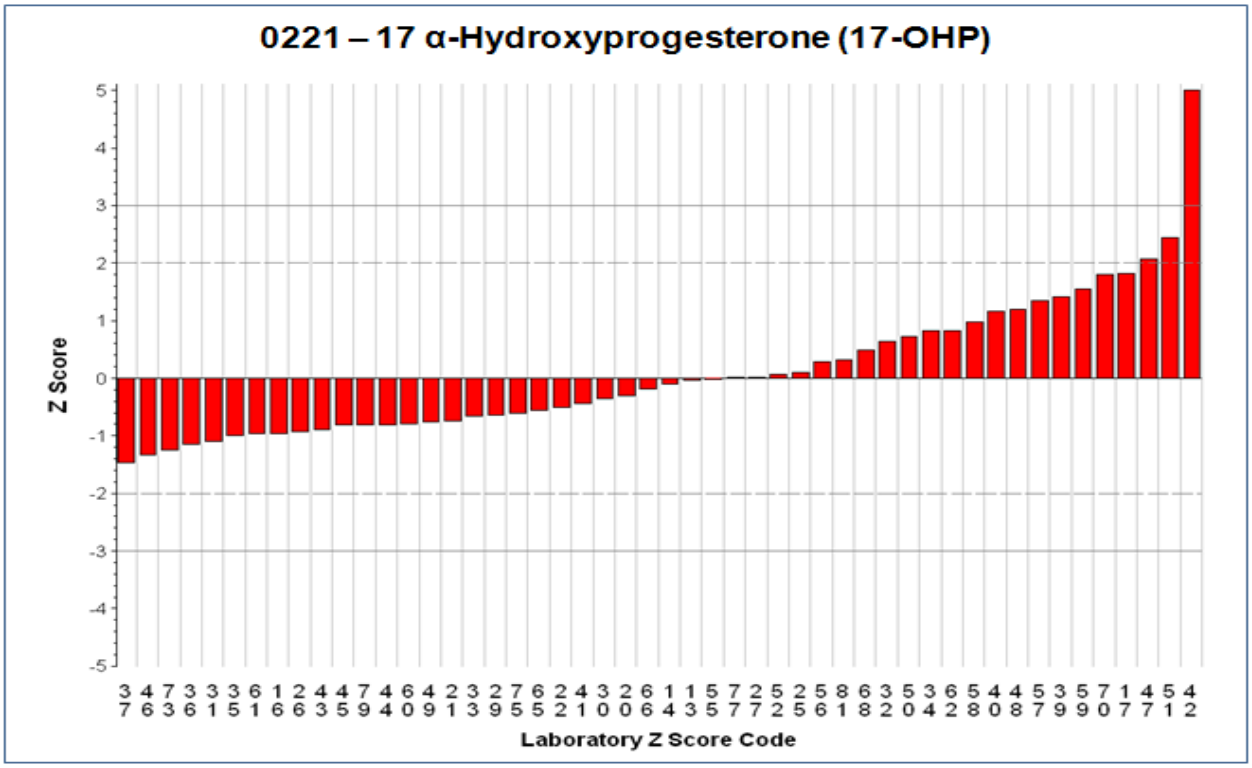
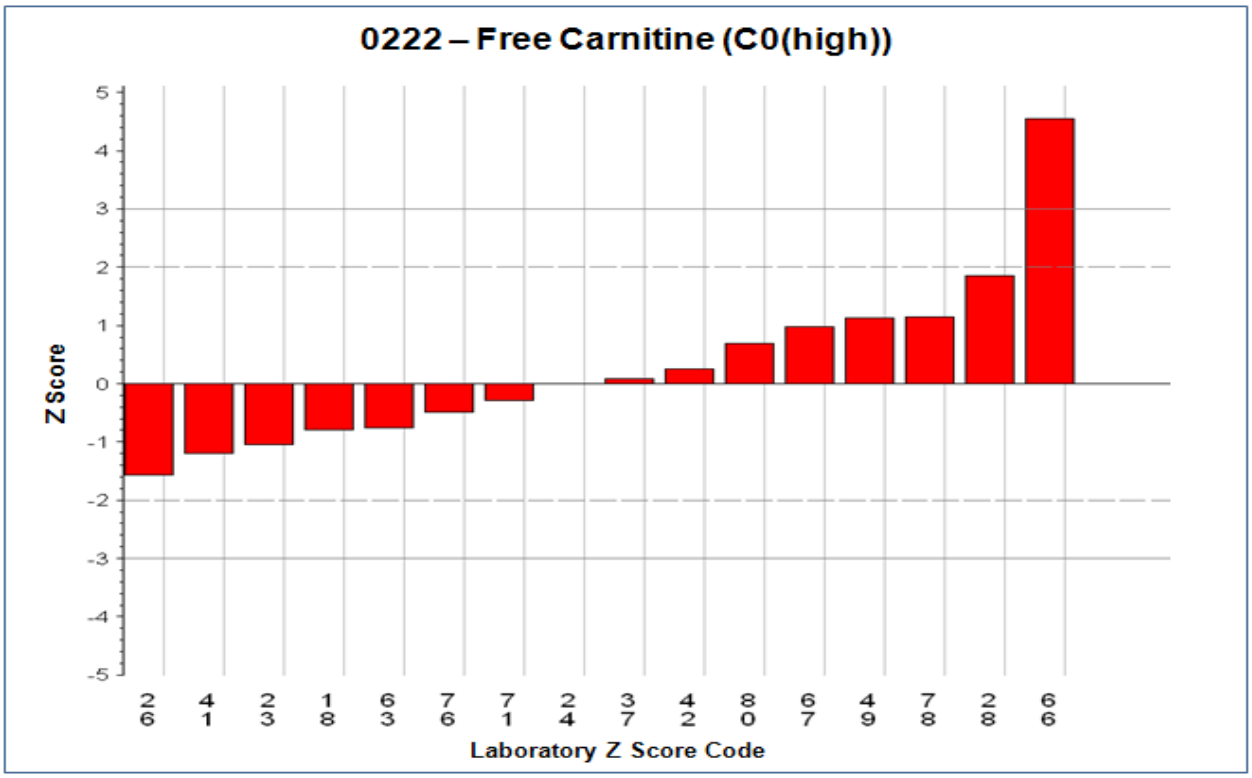
UDOT Z Scores Quarter 2, 2010





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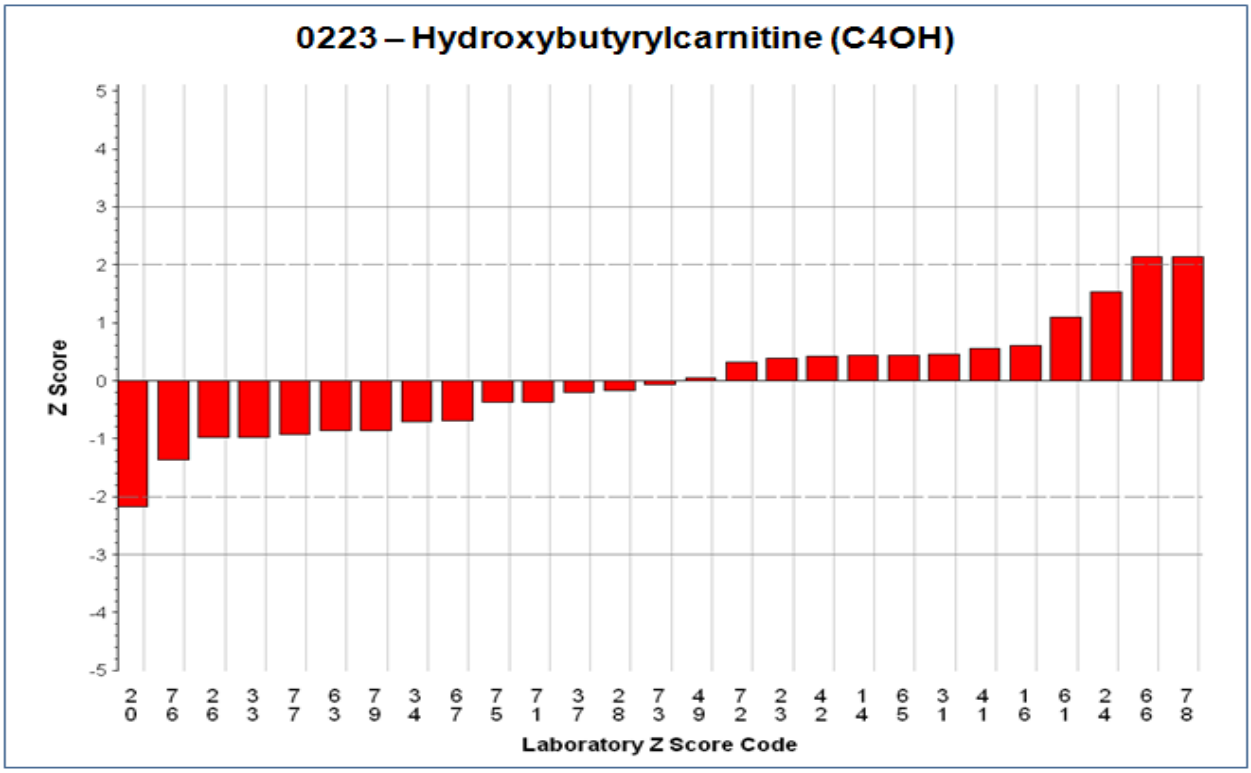
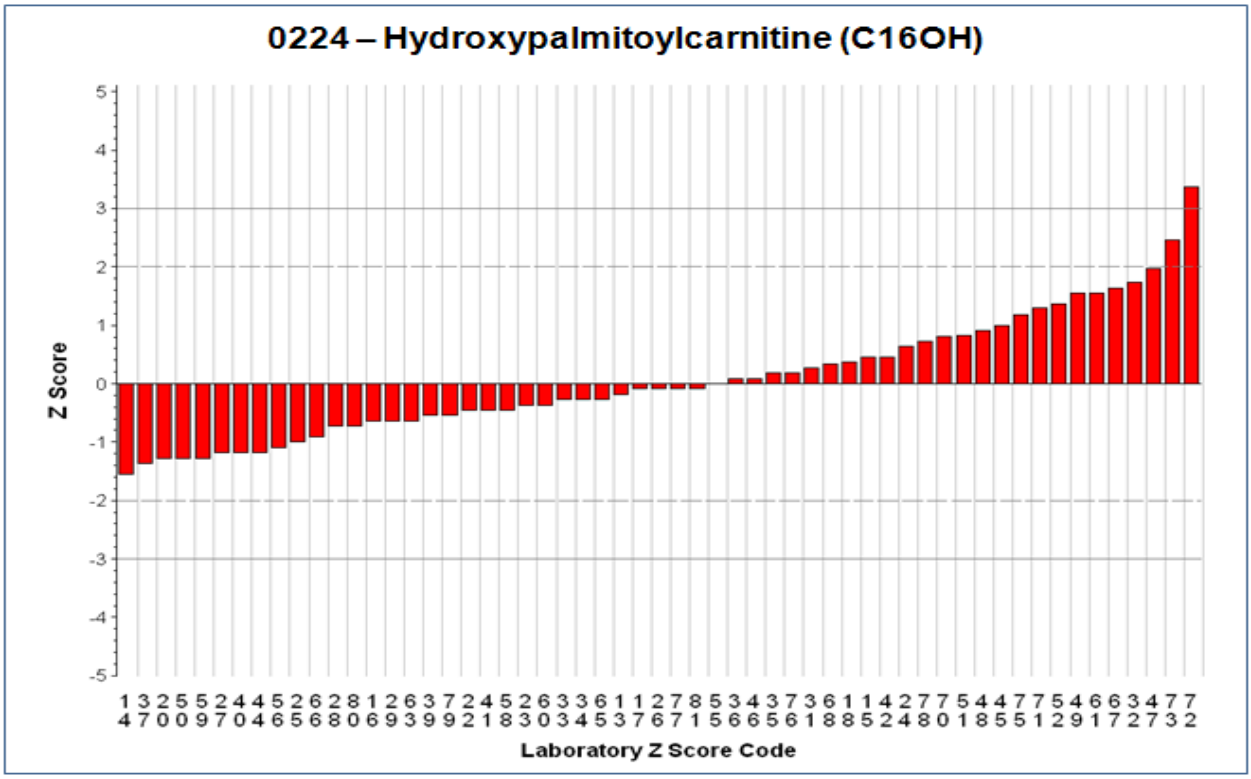
UDOT Z Scores Quarter 2, 2010





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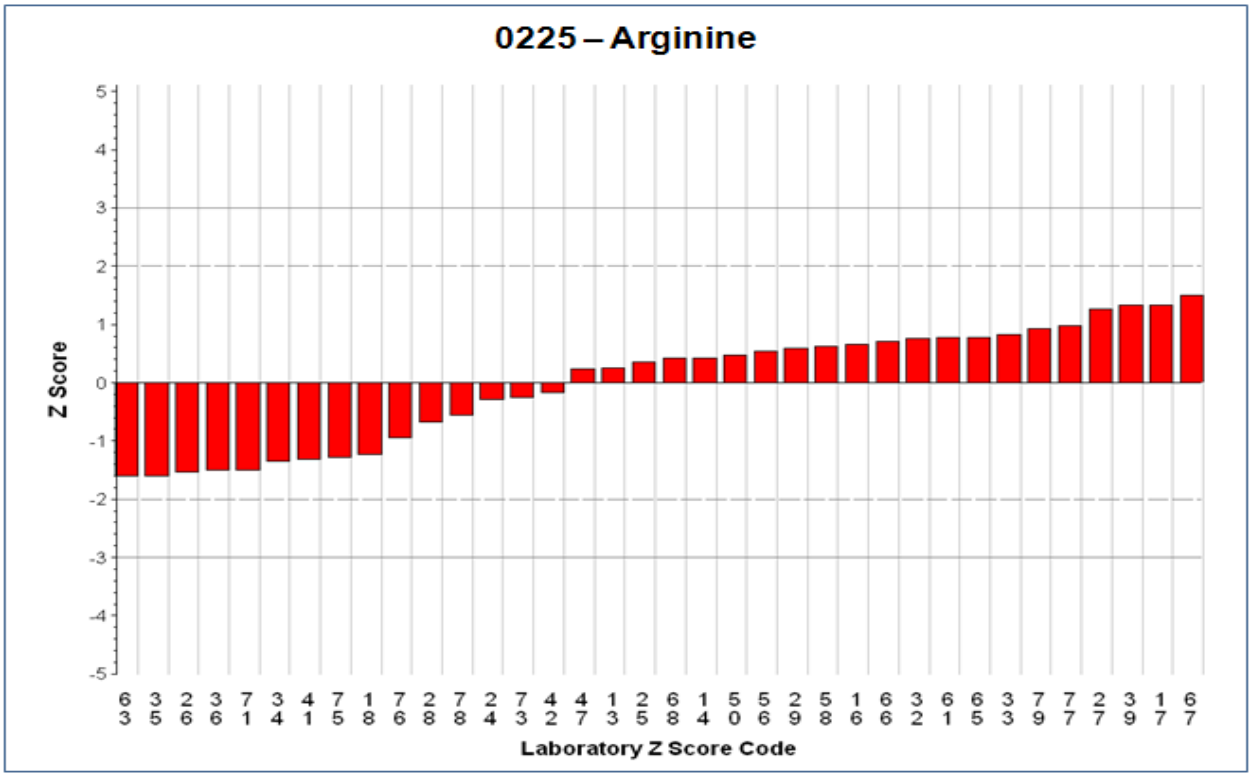
UDOT Z Scores Quarter 2, 2010



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