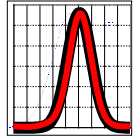


# **Mycotoxin Program**

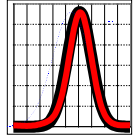
---

## **Recap and Reports**



## Mycotoxin Program Model

- All samples formulated to contain known Mycotoxin quantities.
  - Use professional provider to produce samples.
    - Assigned value for each analyte
    - Uncertainty in assigned value
    - Sample homogeneity assessment
  - Distribution to clients as usual (include MSD?).
  - New input section for the Data Reporting Website.
    - Include detection limit
    - Identify values as a Detect or a Non-detect
    - Do not allow reporting Zero values.
  - Calculate Z scores for detected data.
  - Identify Non-detects and score.
  - Issue sample reports.
-

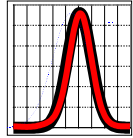


To Calculate a Z Score we need:

- A lab result to test ( $X_{LAB}$ ).
- An Assigned Value ( $X_a$ ) to test against.
- A SD for Proficiency Testing ( $\sigma_{ffp}$ ) that is fit-for-purpose and is usually a measure of the anticipated and usual data spread.

$$Z = \frac{X_{LAB} - X_a}{\sigma_{ffp}}$$

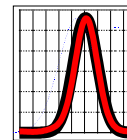
- Choosing  $\sigma_{ffp}$  appropriately will determine the spread in Z scores.
-



## The Importance of $\sigma_{ffp}$ in Assigning Z Scores

Z Scores ranging from -2 to 2 represent  
acceptable data dispersion from  $-2\sigma_{ffp}$  to  $2\sigma_{ffp}$

$$Z = \frac{X_{LAB} - X_a}{\sigma_{ffp}}$$



# Horwitz



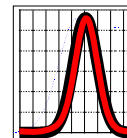
$$\sigma_R = \sigma_H = 0.02 \times C_{mf}^{0.8495}$$

$$\%RSD_H = 2 \times C_{mf}^{-0.1505}$$

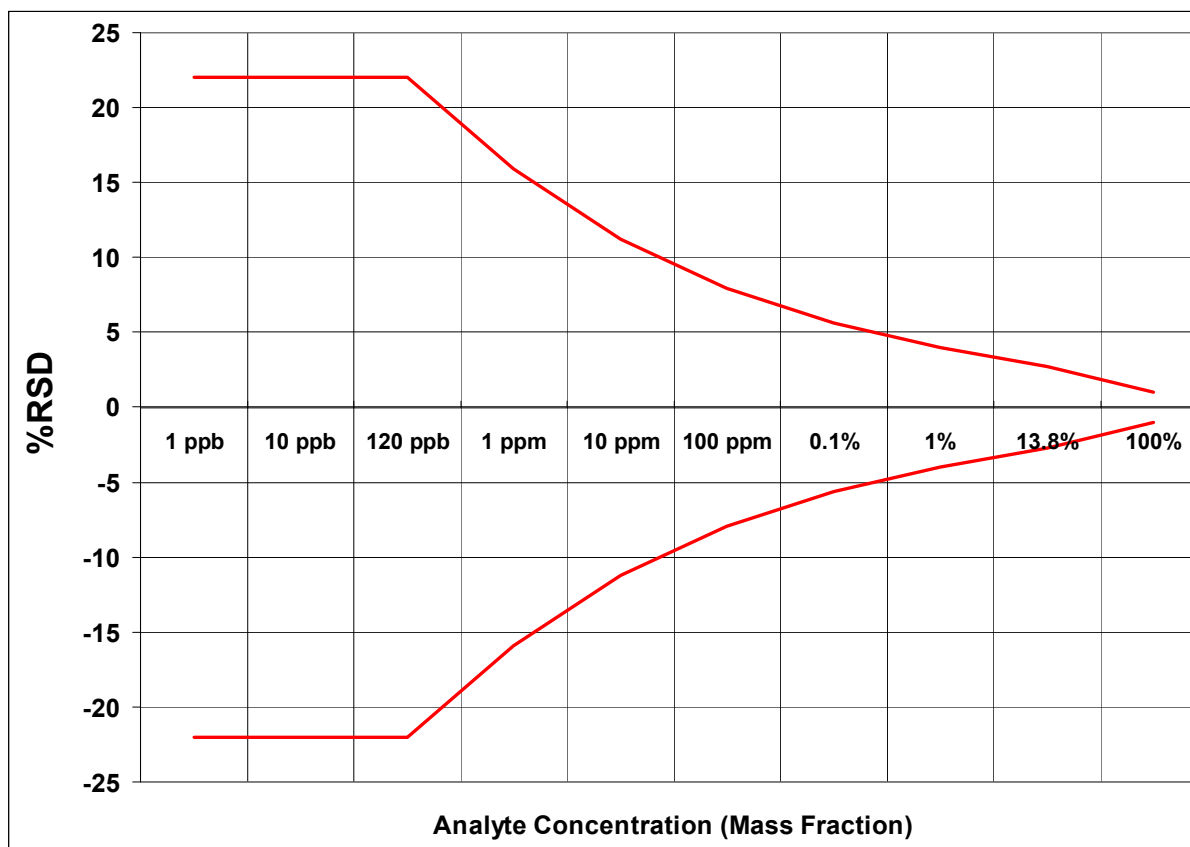
$C_{mf}$  (mass fraction) easily derived from  $X_a$  units

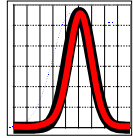
Widely recognized as an appropriate measure of variance among Proficiency testing providers.

## Modified Horwitz Model



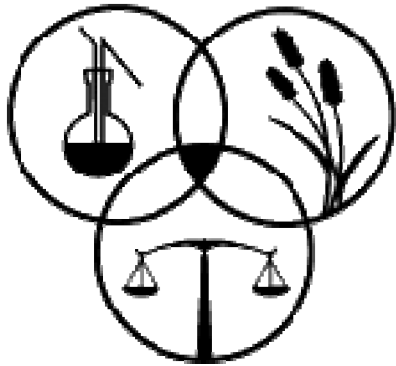
$\sigma_R = 0.22 \times C$	%RSD = 22	if $C < 1.2 \times 10^{-7}$
$\sigma_R = 0.02 \times C^{0.8495}$	%RSD = $2 \times C^{-0.1505}$	if $1.2 \times 10^{-7} \leq C \leq 0.138$
$\sigma_R = 0.01 \times C^{0.5}$	%RSD = $C^{-0.5}$	if $C > 0.138$





## Calculating Z values For Mycotoxins

$$Z = \frac{X_{LAB} - X_{a(Formulation)}}{\sigma_{ModifiedHorwitz}}$$

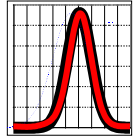


## **Mycotoxin Program**

---

### **Data Reporting and Non-Detects**





Currently Mycotoxin Codes are reporting ~21% zero values.

A zero value may have been a Non-Detect.

Zero is **NOT** a Measurement

It is an abstraction of reporting precision and instrument resolution.

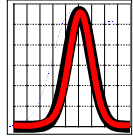
An Analyte Measurement is either:

A **Detect** with a non-zero numerical result.

Or:

A **Non-Detect** with a detection limit.

---



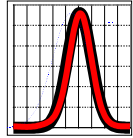
## The New Data Reporting Protocol

If you detect the analyte and get an instrument measurement:  
Report this result in the required units and click **DETECT**.

If you do not detect the analyte:  
Report the Detection Limit in the same units and click **NON-DETECT**.

Any reported value will have to be assigned  
either a DETECT or NON-DETECT status.

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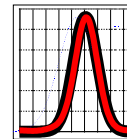
## Data Censored at The Detection Limit

- With Censored data we calculate the POD or “probability of detection”.
- The POD is based on the Assigned Value, LOD and the expected dispersion of lab results for this analyte ( $\sigma_{ffp}$ ).



Now given the LOD, the Assigned Value  $X_a$  and  $\sigma_{ffp}$  we can calculate the probability of detecting a result at that detection limit.

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## Probability of Detection for Non-Detects

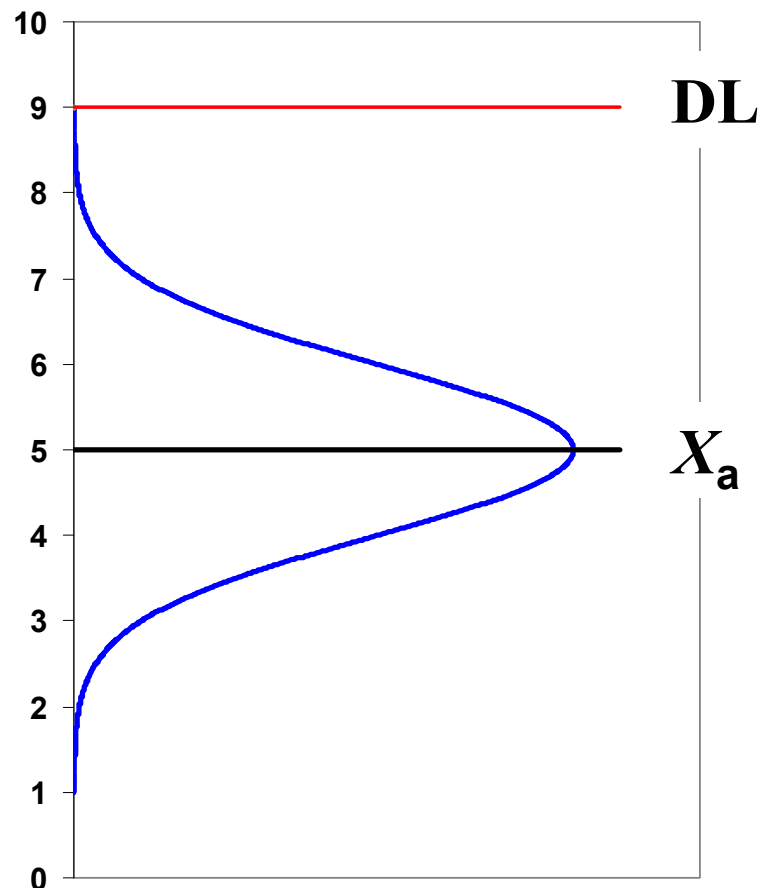
SCORE  
POD (**0.0% p**)

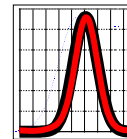
$$X_a = 5$$

$$\sigma_{ffp} = 1$$

**You did not detect the analyte!**

There is a 100.0 % probability that your lab would not have detected this analyte above the Detection Limit.





## Probability of Detection for Non-Detects

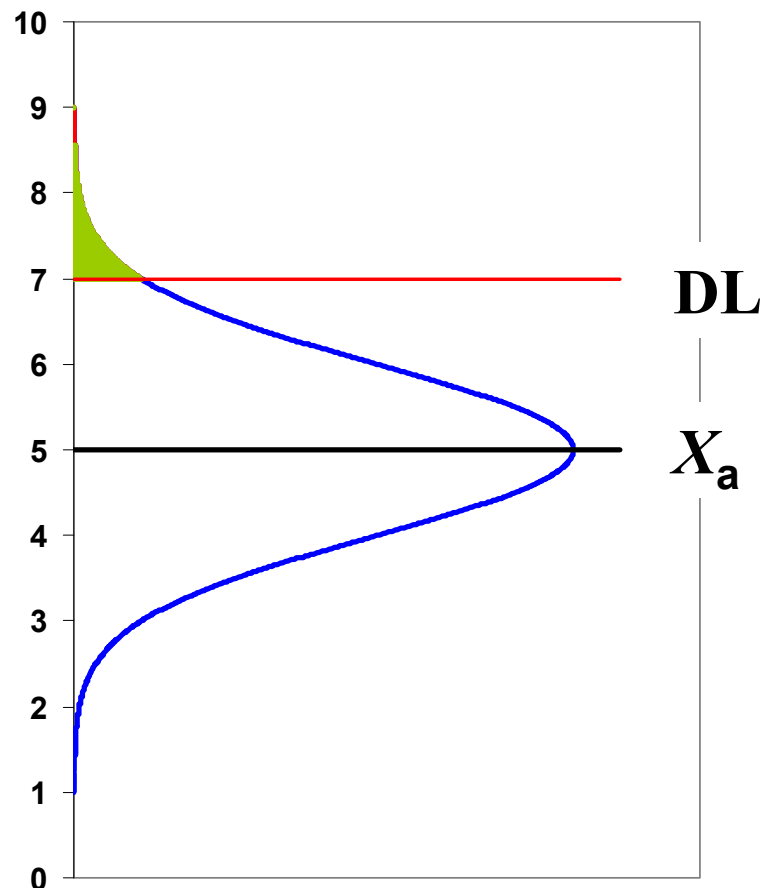
SCORE  
POD (**2.3% p**)

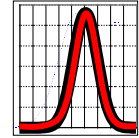
$$X_a = 5$$

$$\sigma_{ffp} = 1$$

**You did not detect the analyte!**

There is a 97.7 % probability that your lab would not have detected this analyte above the Detection Limit.





## Probability of Detection for Non-Detects

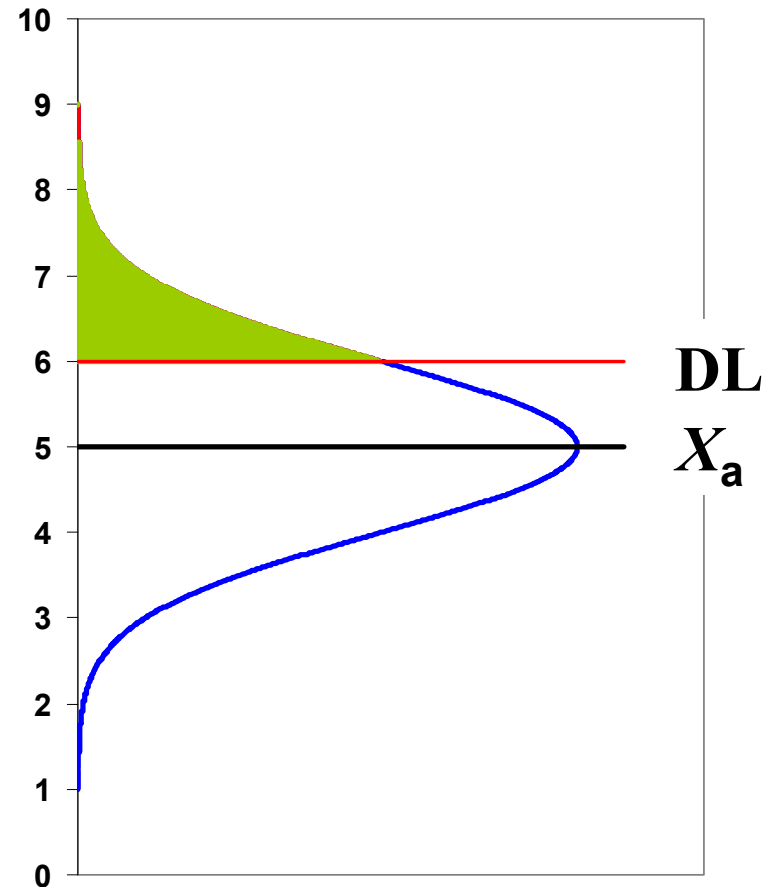
SCORE  
POD (**15.9% p**)

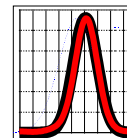
$$X_a = 5$$

$$\sigma_{ffp} = 1$$

**You did not detect the analyte!**

There is a 84.1 % probability that your lab would not have detected this analyte above the Detection Limit.





## Probability of Detection for Non-Detects

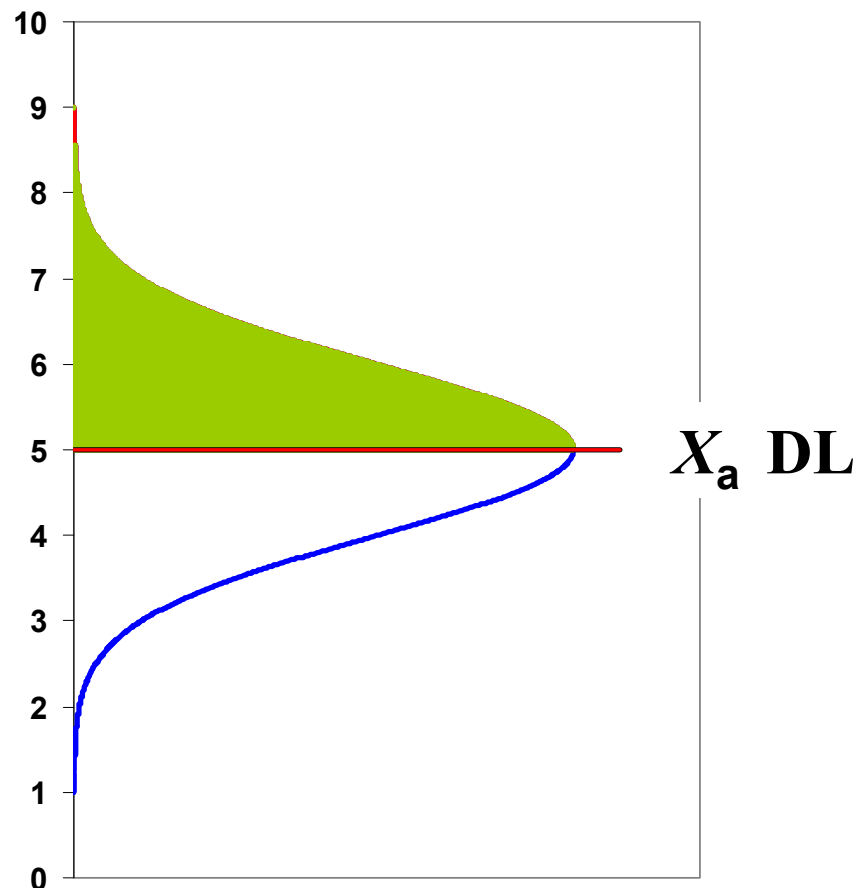
SCORE  
POD (50.0% p)

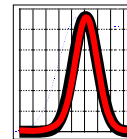
$$X_a = 5$$

$$\sigma_{ffp} = 1$$

**You did not detect the analyte!**

There is a 50.0 % probability that your lab could have detected this analyte above the Detection Limit.





## Probability of Detection for Non-Detects

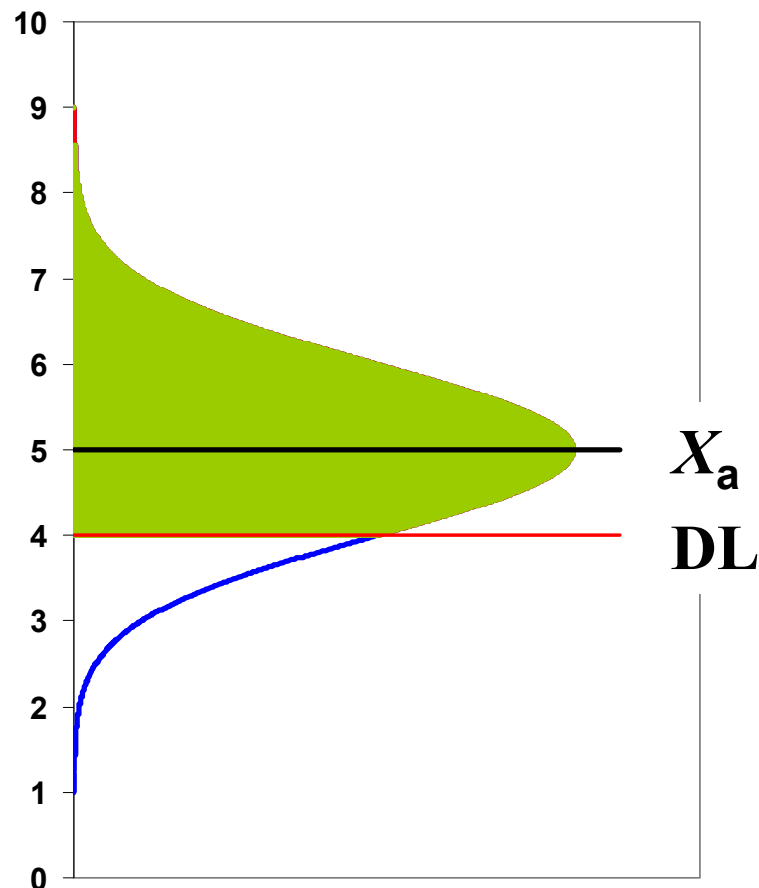
SCORE  
POD (84.1% p)

$$X_a = 5$$

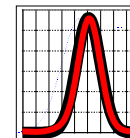
$$\sigma_{ffp} = 1$$

**You did not detect the analyte!**

There is a 15.9 % probability that your lab would not have detected this analyte above the Detection Limit.







## Probability of Detection for Non-Detects

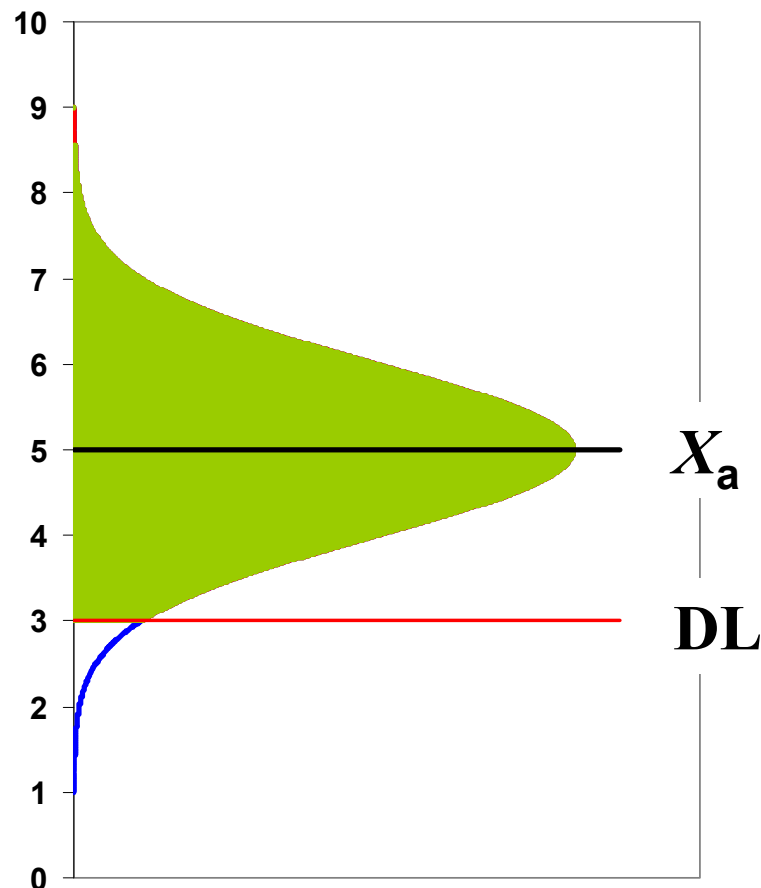
SCORE  
POD (97.7% p)

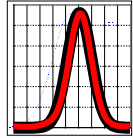
$$X_a = 5$$

$$\sigma_{ffp} = 1$$

**You did not detect the analyte!**

There is a 2.3 % probability that your lab would not have detected this analyte above the Detection Limit.





## Probability of Detection for Non-Detects

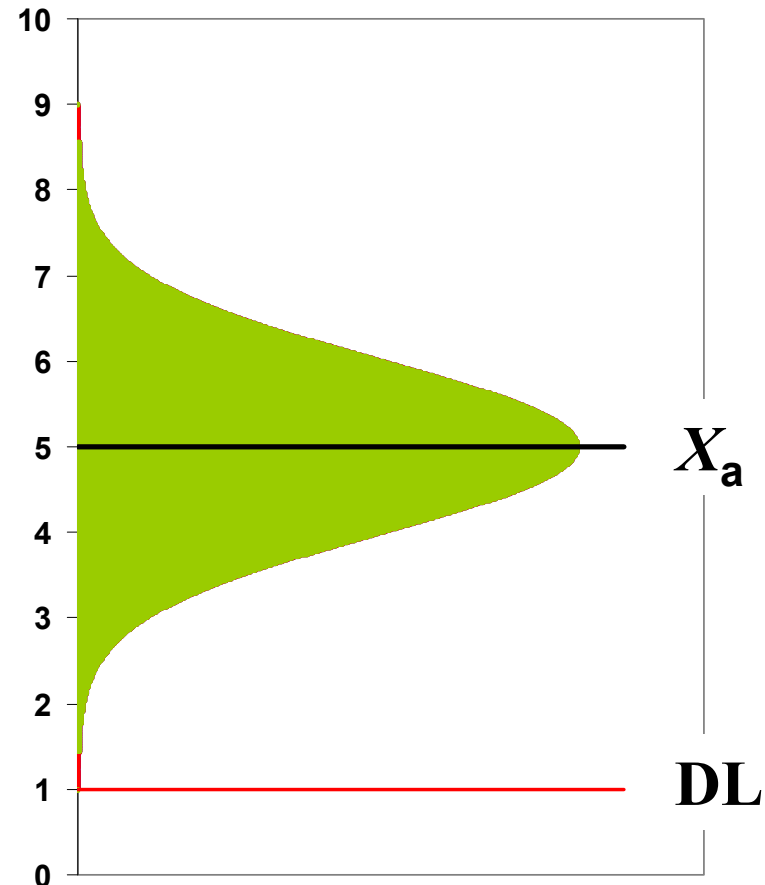
SCORE  
POD (**100.0% p**)

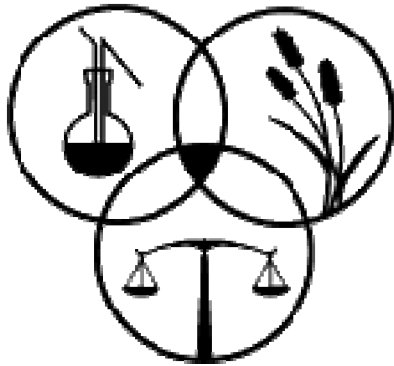
$$X_a = 5$$

$$\sigma_{ffp} = 1$$

**You did not detect the analyte!**

There is a 0 % probability that your lab would not have detected this analyte above the Detection Limit.

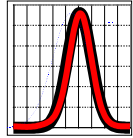




## **Mycotoxin Program**

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**Example Reports from an  
Artificial Dataset**



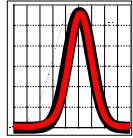
All Tests File



Report Cards



Review Charts



**THANK YOU!**

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**Mycotoxin Proficiency Testing**  
**All Tests for Sample # 201349 Prototype Test Data**

Lab #	Code	Analyte	Method	Result 1	Result 2	Detect ?		LOD	Probability of Detection	Z Score	Assigned Value	Horwitz
						D1	D2					
9998	601.21	AB1 (ppb)	LC post-col photochem der. -FI	5.874	6.321	Y	Y		100%	-0.80	7.409	1.63
0027	601.21	AB1 (ppb)	LC post-col photochem der. -FI	7.456	7.123	Y	Y		100%	-0.07	7.409	1.63
9995	601.23	AB1 (ppb)	LC-MS/MS	8.025	9.654	Y	Y		100%	0.88	7.409	1.63
9995	602.23	AB2 (ppb)	LC-MS/MS	1.339	0.989	Y	N	1	67.78%	0.92	1.113	0.245
0027	602.21	AB2 (ppb)	LC post-col photochem der.-FI			N	N	1	67.78%	NoZ	1.113	0.245
0027	603.21	AG1 (ppb)	LC post-col photochem der. -FI	2.105	2.357	Y	Y		100%	-0.82	2.719	0.598
9995	603.23	AG1 (ppb)	LC-MS/MS	3.587	3.047	Y	Y		100%	1.00	2.719	0.598
9998	603.21	AG1 (ppb)	LC post-col photochem der. -FI			N	N	2.5	64.30%	NoZ	2.719	0.598
0027	604.21	AG2 (ppb)	LC post-col photochem der. -FI			N	N	1	50.00%	NoZ	1	0.22
9995	604.23	AG2 (ppb)	LC-MS/MS	0.821	0.786	N	N	1	50.00%	NoZ	1	0.22
0027	610.21	Deoxynivalenol (ppb)	LC-FI	487.56	479.26	Y	Y		100%	-0.54	533.78	93.848
0027	610.01	Deoxynivalenol (ppb)	Neogen Veratox for DON	535.64	512.69	Y	Y		100%	-0.10	533.78	93.848
9998	610.21	Deoxynivalenol (ppb)	LC-FI	515.63	536.89	Y	Y		100%	-0.08	533.78	93.848
9996	610.01	Deoxynivalenol (ppb)	Neogen Veratox for DON	586.94	512.39	Y	Y		100%	0.17	533.78	93.848
9997	610.20	Deoxynivalenol (ppb)	LC	563.21	547.82	Y	Y		100%	0.23	533.78	93.848
9995	610.23	Deoxynivalenol (ppb)	LC-MS/MS	586.32	541.06	Y	Y		100%	0.32	533.78	93.848
9995	621.23	FB1 (ppb)	LC-MS/MS	1,243.80	1,123.70	Y	Y		100%	-0.55	1,292.70	198.95
9998	621.21	FB1 (ppb)	LC-FI, OPA der.	1,236.90	1,247.30	Y	Y		100%	-0.25	1,292.70	198.95
0027	621.20	FB1 (ppb)	LC	1,479.00	1,425.70	Y	Y		100%	0.80	1,292.70	198.95
9995	622.23	FB2 (ppb)	LC-MS/MS	487.53	463.21	Y	Y		100%	-0.31	503.02	89.233
9998	622.21	FB2 (ppb)	LC-FI, OPA der.	514.36	546.98	Y	Y		100%	0.31	503.02	89.233
9995	623.23	FB3 (ppb)	LC-MS/MS	203.48	195.65	Y	Y		100%	-0.85	240.21	47.626
9998	623.21	FB3 (ppb)	LC-FI, OPA der.	287.41	274.31	Y	Y		100%	0.85	240.21	47.626
9997	630.20	Ochratoxin A (ppb)	LC	64.872	69.526	Y	Y		100%	-1.24	92.42	20.332
9998	630.21	Ochratoxin A (ppb)	LC post-col photochem der. FI		85.23	N	Y	75	80.42%	-0.35	92.42	20.332
0027	630.20	Ochratoxin A (ppb)	LC	90.125	89.541	Y	Y		100%	-0.13	92.42	20.332
0027	630.01	Ochratoxin A (ppb)	Neogen Veratox for Ochratoxin	87.46	95.23	Y	Y		100%	-0.05	92.42	20.332
9996	630.01	Ochratoxin A (ppb)	Neogen Veratox for Ochratoxin	105.46	117.98	Y	Y		100%	0.95	92.42	20.332
9995	630.23	Ochratoxin A (ppb)	LC-MS/MS	120.36	108.26	Y	Y		100%	1.08	92.42	20.332
9995	640.23	T-2 (ppb)	LC-MS/MS	203.84	215.63	Y	Y		100%	-0.46	230.72	46.023
9996	640.01	T-2 (ppb)	Neogen Veratox T-2 / HT-2	230.45	198.47	Y	Y		100%	-0.35	230.72	46.023
9998	640.25	T-2 (ppb)	GC-MS	245.63	237.12	Y	Y		100%	0.23	230.72	46.023
9997	640.24	T-2 (ppb)	GC-ECD	236.51	248.72	Y	Y		100%	0.26	230.72	46.023
0027	640.01	T-2 (ppb)	Neogen Veratox T-2 / HT-2	254.13	236.74	Y	Y		100%	0.32	230.72	46.023

Lab #	Code	Analyte	Method	Result 1	Result 2	Detect ?		LOD	Probability of Detection	Z Score	Assigned Value	Horwitz
						D1	D2					
9998	600.21	Total Aflatoxin (ppb)	LC post-col photochem der. FI	5.874	6.321	Y	Y		100%	-1.80	10.096	2.221
9997	600.20	Total Aflatoxin (ppb)	LC	8.62	7.96	Y	Y		100%	-0.81	10.096	2.221
0027	600.21	Total Aflatoxin (ppb)	LC post-col photochem der. FI	9.561	9.48	Y	Y		100%	-0.26	10.096	2.221
9996	600.01	Total Aflatoxin (ppb)	Neogen Veratox Aflatoxin	12.56	9.65	Y	Y		100%	0.45	10.096	2.221
0027	600.01	Total Aflatoxin (ppb)	Neogen Veratox Aflatoxin	11.65	11.23	Y	Y		100%	0.61	10.096	2.221
9995	600.24	Total Aflatoxin (ppb)	LC-MS/MS	13.772	14.476	Y	Y		100%	1.81	10.096	2.221
0027	620.20	Total Fumonisin (ppb)	LC	1,958.50	2,106.30	Y	Y		100%	-0.54	2,202.60	312.86
9998	620.21	Total Fumonisin (ppb)	LC-FI, OPA der.	2,038.70	2,068.60	Y	Y		100%	-0.48	2,202.60	312.86
0027	620.01	Total Fumonisin (ppb)	Neogen Veratox for Fumonisin	2,145.80	2,076.30	Y	Y		100%	-0.29	2,202.60	312.86
9996	620.01	Total Fumonisin (ppb)	Neogen Veratox for Fumonisin	2,300.40	2,287.90	Y	Y		100%	0.29	2,202.60	312.86
9997	620.20	Total Fumonisin (ppb)	LC	2,354.20	2,689.50	Y	Y		100%	1.02	2,202.60	312.86
0027	650.20	Zearalenone (ppb)	LC	247.85	238.65	Y	Y		100%	-0.46	267.41	52.169
0027	650.01	Zearalenone (ppb)	Neogen Veratox Zearalenone	265.87	254.78	Y	Y		100%	-0.14	267.41	52.169
9996	650.01	Zearalenone (ppb)	Neogen Veratox Zearalenone	286.31	245.63	Y	Y		100%	-0.03	267.41	52.169
9997	650.20	Zearalenone (ppb)	LC	278.63	257.43	Y	Y		100%	0.01	267.41	52.169
9995	650.24	Zearalenone (ppb)	LC-MS/MS	274.11	276.26	Y	Y		100%	0.15	267.41	52.169
9998	650.21	Zearalenone (ppb)	LC-FI, ISO	296.25	287.12	Y	Y		100%	0.47	267.41	52.169



**Mycotoxin Proficiency Testing** **Report Card for Lab #0027** **Issue Date: 01/01/2014**  
**Sample # 201349 Prototype Test Data**

Method Code	Analyte	Method Used	Result 1	Result 2	Detect ?		LOD	Probability of Detection	Z Score	Assigned Value	Horwitz $\sigma$ ffp
					D1	D2					
601.21	AB1 (ppb)	LC post-col photochem der. -FI	7.456	7.123	Y	Y		100%	-0.07	7.409	1.63
602.21	AB2 (ppb)	LC post-col photochem der.-FI			N	N	1	67.78%	NoZ	1.113	0.245
603.21	AG1 (ppb)	LC post-col photochem der. -FI	2.105	2.357	Y	Y		100%	-0.82	2.719	0.598
604.21	AG2 (ppb)	LC post-col photochem der. -FI			N	N	1	50.00%	NoZ	1	0.22
610.21	Deoxynivalenol (ppb)	LC-FI	487.56	479.26	Y	Y		100%	-0.54	533.78	93.848
610.01	Deoxynivalenol (ppb)	Neogen Veratox for DON	535.64	512.69	Y	Y		100%	-0.10	533.78	93.848
621.20	FB1 (ppb)	LC	1,479.00	1,425.70	Y	Y		100%	0.80	1,292.70	198.95
630.20	Ochratoxin A (ppb)	LC	90.125	89.541	Y	Y		100%	-0.13	92.42	20.332
630.01	Ochratoxin A (ppb)	Neogen Veratox for Ochratoxin	87.46	95.23	Y	Y		100%	-0.05	92.42	20.332
640.01	T-2 (ppb)	Neogen Veratox T-2 / HT-2	254.13	236.74	Y	Y		100%	0.32	230.72	46.023
600.21	Total Aflatoxin (ppb)	LC post-col photochem der. FI	9.561	9.48	Y	Y		100%	-0.26	10.096	2.221
600.01	Total Aflatoxin (ppb)	Neogen Veratox Aflatoxin	11.65	11.23	Y	Y		100%	0.61	10.096	2.221
620.20	Total Fumonisin (ppb)	LC	1,958.50	2,106.30	Y	Y		100%	-0.54	2,202.60	312.86
620.01	Total Fumonisin (ppb)	Neogen Veratox for Fumonisin	2,145.80	2,076.30	Y	Y		100%	-0.29	2,202.60	312.86
650.20	Zearalenone (ppb)	LC	247.85	238.65	Y	Y		100%	-0.46	267.41	52.169
650.01	Zearalenone (ppb)	Neogen Veratox Zearalenone	265.87	254.78	Y	Y		100%	-0.14	267.41	52.169

Notes: Interpreting Z Scores: Red indicates a normally distributed Z value >3 or <-3 (requires action), Orange = Z between 2 and 3 or -2 and -3 (warning) and Green = Z < 2 and >-2 (OK at 95%). If only 1 of 2 results detected Z for that is Grey and Probability of Detection is for the Non-Detect (see documentation). A Red NoZ indicates both results Not Detected with a Probability Of Detecting a single value.





**Mycotoxin Proficiency Testing** **Report Card for Lab #9995** **Issue Date: 01/01/2014**  
**Sample # 201349 Prototype Test Data**

Method Code	Analyte	Method Used	Result 1	Result 2	Detect ?		LOD	Probability of Detection	Z Score	Assigned Value	Horwitz $\sigma$ fp
					D1	D2					
601.23	AB1 (ppb)	LC-MS/MS	8.025	9.654	Y	Y		100%	0.88	7.409	1.63
602.23	AB2 (ppb)	LC-MS/MS	1.339	0.989	Y	N	1	67.78%	0.92	1.113	0.245
603.23	AG1 (ppb)	LC-MS/MS	3.587	3.047	Y	Y		100%	1.00	2.719	0.598
604.23	AG2 (ppb)	LC-MS/MS	0.821	0.786	N	N	1	50.00%	NoZ	1	0.22
610.23	Deoxynivalenol (ppb)	LC-MS/MS	586.32	541.06	Y	Y		100%	0.32	533.78	93.848
621.23	FB1 (ppb)	LC-MS/MS	1,243.80	1,123.70	Y	Y		100%	-0.55	1,292.70	198.95
622.23	FB2 (ppb)	LC-MS/MS	487.53	463.21	Y	Y		100%	-0.31	503.02	89.233
623.23	FB3 (ppb)	LC-MS/MS	203.48	195.65	Y	Y		100%	-0.85	240.21	47.626
630.23	Ochratoxin A (ppb)	LC-MS/MS	120.36	108.26	Y	Y		100%	1.08	92.42	20.332
640.23	T-2 (ppb)	LC-MS/MS	203.84	215.63	Y	Y		100%	-0.46	230.72	46.023
600.24	Total Aflatoxin (ppb)	LC-MS/MS	13.772	14.476	Y	Y		100%	1.81	10.096	2.221
650.24	Zearalenone (ppb)	LC-MS/MS	274.11	276.26	Y	Y		100%	0.15	267.41	52.169

Notes: Interpreting Z Scores: Red indicates a normally distributed Z value >3 or <-3 (requires action), Orange = Z between 2 and 3 or -2 and -3 (warning) and Green = Z < 2 and >-2 (OK at 95%). If only 1 of 2 results detected Z for that is Grey and Probability of Detection is for the Non-Detect (see documentation). A Red NoZ indicates both results Not Detected with a Probability Of Detecting a single value.



**Mycotoxin Proficiency Testing** **Report Card for Lab #9996** **Issue Date: 01/01/2014**  
**Sample # 201349 Prototype Test Data**

Method Code	Analyte	Method Used	Result 1	Result 2	Detect ?		LOD	Probability of Detection	Z Score	Assigned Value	Horwitz $\sigma$ fp
					D1	D2					
610.01	Deoxynivalenol (ppb)	Neogen Veratox for DON	586.94	512.39	Y	Y		100%	0.17	533.78	93.848
630.01	Ochratoxin A (ppb)	Neogen Veratox for Ochratoxin	105.46	117.98	Y	Y		100%	0.95	92.42	20.332
640.01	T-2 (ppb)	Neogen Veratox T-2 / HT-2	230.45	198.47	Y	Y		100%	-0.35	230.72	46.023
600.01	Total Aflatoxin (ppb)	Neogen Veratox Aflatoxin	12.56	9.65	Y	Y		100%	0.45	10.096	2.221
620.01	Total Fumonisin (ppb)	Neogen Veratox for Fumonisin	2,300.40	2,287.90	Y	Y		100%	0.29	2,202.60	312.86
650.01	Zearalenone (ppb)	Neogen Veratox Zearalenone	286.31	245.63	Y	Y		100%	-0.03	267.41	52.169

Notes: Interpreting Z Scores: Red indicates a normally distributed Z value >3 or <-3 (requires action), Orange = Z between 2 and 3 or -2 and -3 (warning) and Green = Z < 2 and >-2 (OK at 95%). If only 1 of 2 results detected Z for that is Grey and Probability of Detection is for the Non-Detect (see documentation). A Red NoZ indicates both results Not Detected with a Probability Of Detecting a single value.



**Mycotoxin Proficiency Testing** **Report Card for Lab #9997** **Issue Date: 01/01/2014**  
**Sample # 201349 Prototype Test Data**

Method Code	Analyte	Method Used	Result 1	Result 2	Detect ?		LOD	Probability of Detection	Z Score	Assigned Value	Horwitz $\sigma$ fp
					D1	D2					
610.20	Deoxynivalenol (ppb)	LC	563.21	547.82	Y	Y		100%	0.23	533.78	93.848
630.20	Ochratoxin A (ppb)	LC	64.872	69.526	Y	Y		100%	-1.24	92.42	20.332
640.24	T-2 (ppb)	GC-ECD	236.51	248.72	Y	Y		100%	0.26	230.72	46.023
600.20	Total Aflatoxin (ppb)	LC	8.62	7.96	Y	Y		100%	-0.81	10.096	2.221
620.20	Total Fumonisin (ppb)	LC	2,354.20	2,689.50	Y	Y		100%	1.02	2,202.60	312.86
650.20	Zearalenone (ppb)	LC	278.63	257.43	Y	Y		100%	0.01	267.41	52.169

Notes: Interpreting Z Scores: Red indicates a normally distributed Z value >3 or <-3 (requires action), Orange = Z between 2 and 3 or -2 and -3 (warning) and Green = Z < 2 and >-2 (OK at 95%). If only 1 of 2 results detected Z for that is Grey and Probability of Detection is for the Non-Detect (see documentation). A Red NoZ indicates both results Not Detected with a Probability Of Detecting a single value.



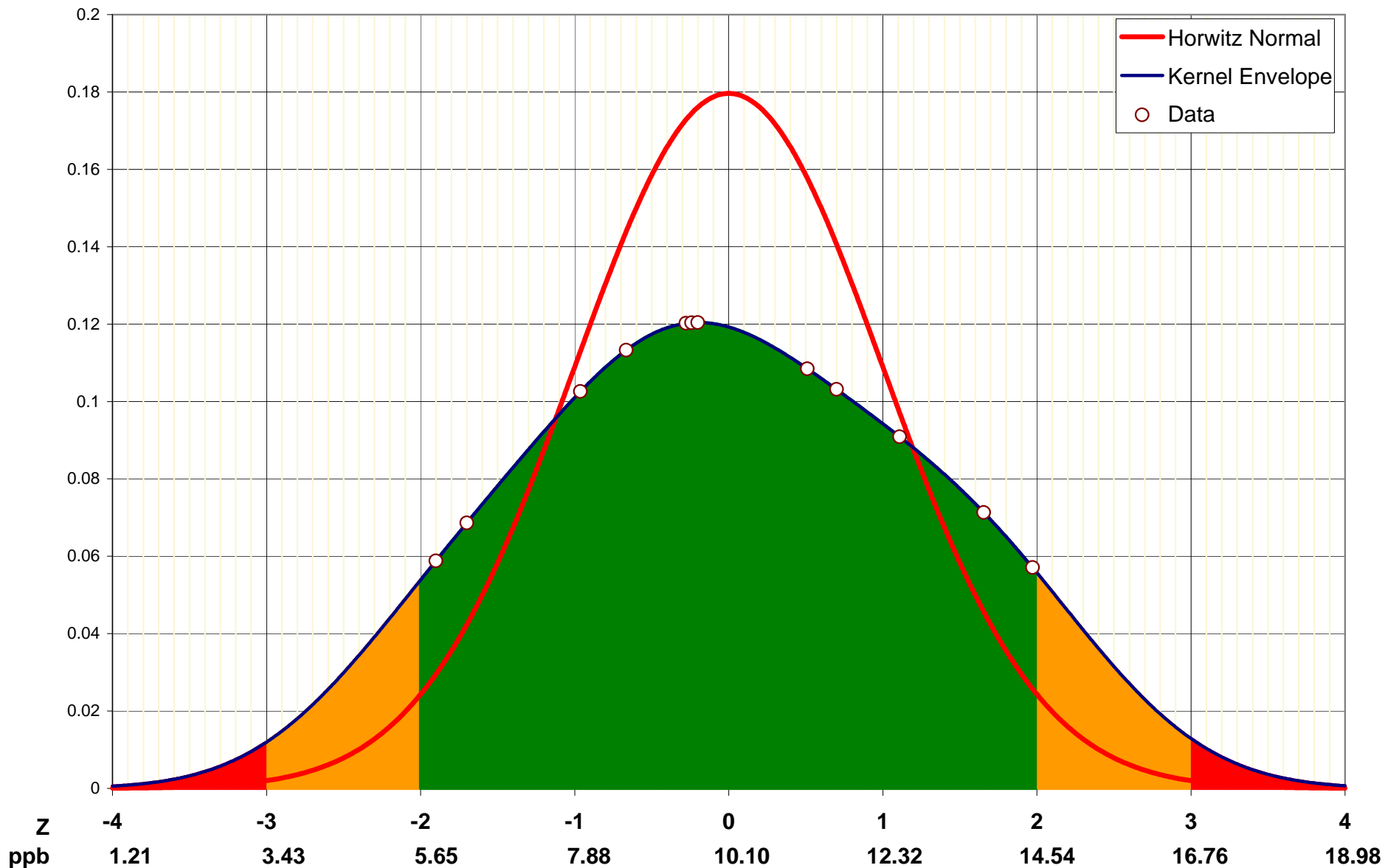
**Mycotoxin Proficiency Testing** **Report Card for Lab #9998** **Issue Date: 01/01/2014**  
**Sample # 201349 Prototype Test Data**

Method Code	Analyte	Method Used	Result 1	Result 2	Detect ?		LOD	Probability of Detection	Z Score	Assigned Value	Horwitz $\sigma$ ffp
					D1	D2					
601.21	AB1 (ppb)	LC post-col photochem der. -FI	5.874	6.321	Y	Y		100%	-0.80	7.409	1.63
603.21	AG1 (ppb)	LC post-col photochem der. -FI			N	N	2.5	64.30%	NoZ	2.719	0.598
610.21	Deoxynivalenol (ppb)	LC-FI	515.63	536.89	Y	Y		100%	-0.08	533.78	93.848
621.21	FB1 (ppb)	LC-FI, OPA der.	1,236.90	1,247.30	Y	Y		100%	-0.25	1,292.70	198.95
622.21	FB2 (ppb)	LC-FI, OPA der.	514.36	546.98	Y	Y		100%	0.31	503.02	89.233
623.21	FB3 (ppb)	LC-FI, OPA der.	287.41	274.31	Y	Y		100%	0.85	240.21	47.626
630.21	Ochratoxin A (ppb)	LC post-col photochem der. FI		85.23	N	Y	75	80.42%	-0.35	92.42	20.332
640.25	T-2 (ppb)	GC-MS	245.63	237.12	Y	Y		100%	0.23	230.72	46.023
600.21	Total Aflatoxin (ppb)	LC post-col photochem der. FI	5.874	6.321	Y	Y		100%	-1.80	10.096	2.221
620.21	Total Fumonisin (ppb)	LC-FI, OPA der.	2,038.70	2,068.60	Y	Y		100%	-0.48	2,202.60	312.86
650.21	Zearalenone (ppb)	LC-FI, ISO	296.25	287.12	Y	Y		100%	0.47	267.41	52.169

Notes: Interpreting Z Scores: Red indicates a normally distributed Z value >3 or <-3 (requires action), Orange = Z between 2 and 3 or -2 and -3 (warning) and Green = Z < 2 and >-2 (OK at 95%). If only 1 of 2 results detected Z for that is Grey and Probability of Detection is for the Non-Detect (see documentation). A Red NoZ indicates both results Not Detected with a Probability Of Detecting a single value.

**Total Aflatoxin (ppb) Code: 600 - In Sample # 201349, Prototype Test Data**  
**Kernel Density Envelope Detected Values Relative to Normal Horwitz Curve**

Issue Date: 01/01/2014



**Assigned Value** 10.096 (ppb)  
**Horwitz SD** 2.22 (ppb)  
**Participating Labs** 5

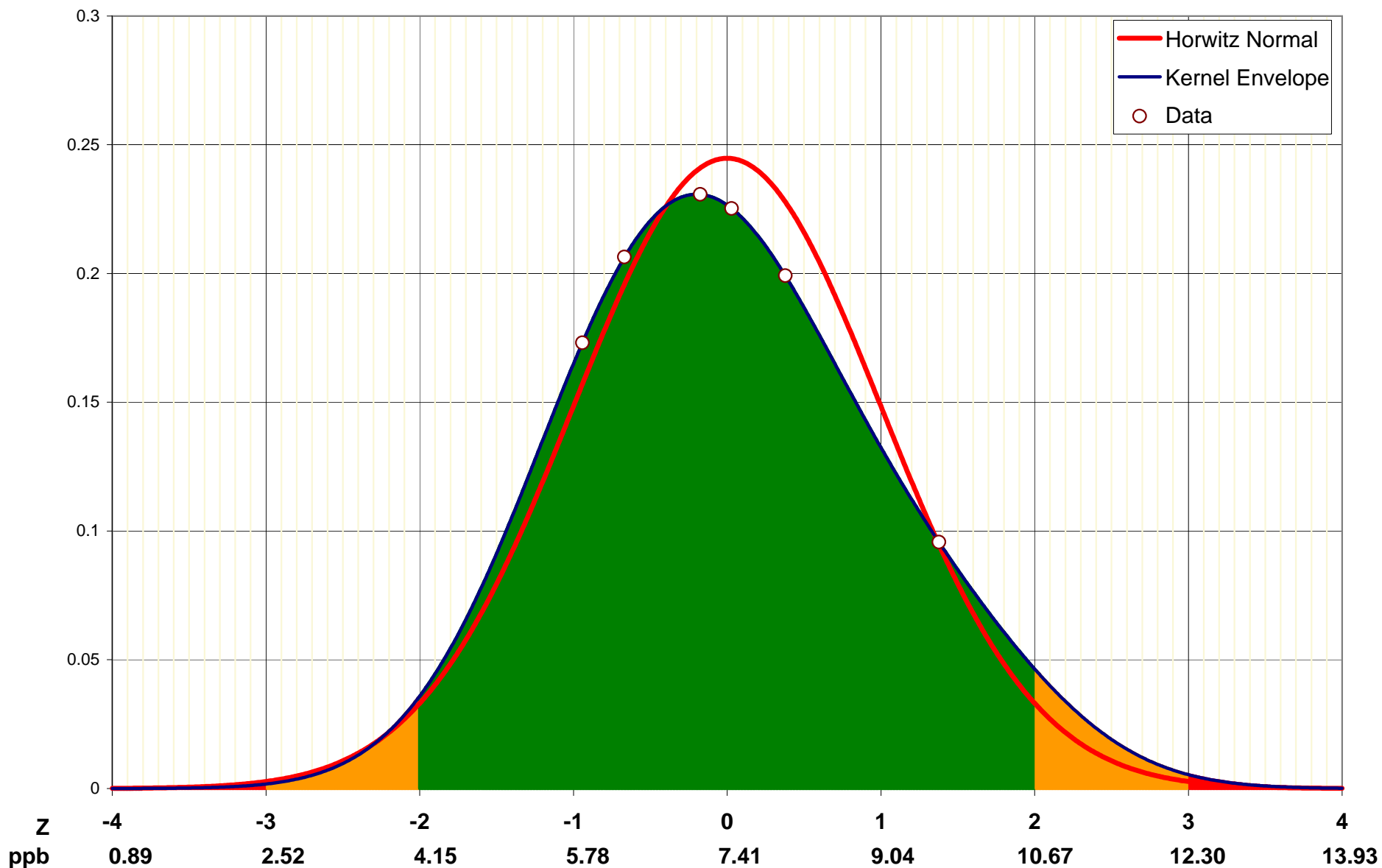
**# Methods Used** 4  
**Kernel Bandwidth** 1.67 (ppb)  
**Number of Non-Detects** 0  
**Number of Detects** 12

**Unique LOD's at:**

Note: Area Under the Kernel Envelope is Identical to Area Under Horwitz Normal Curve.

**AB1 (ppb) Code: 601 - In Sample # 201349, Prototype Test Data**  
**Kernel Density Envelope Detected Values Relative to Normal Horwitz Curve**

Issue Date: 01/01/2014



**Assigned Value** 7.409 (ppb)  
**Horwitz SD** 1.63 (ppb)  
**Participating Labs** 3

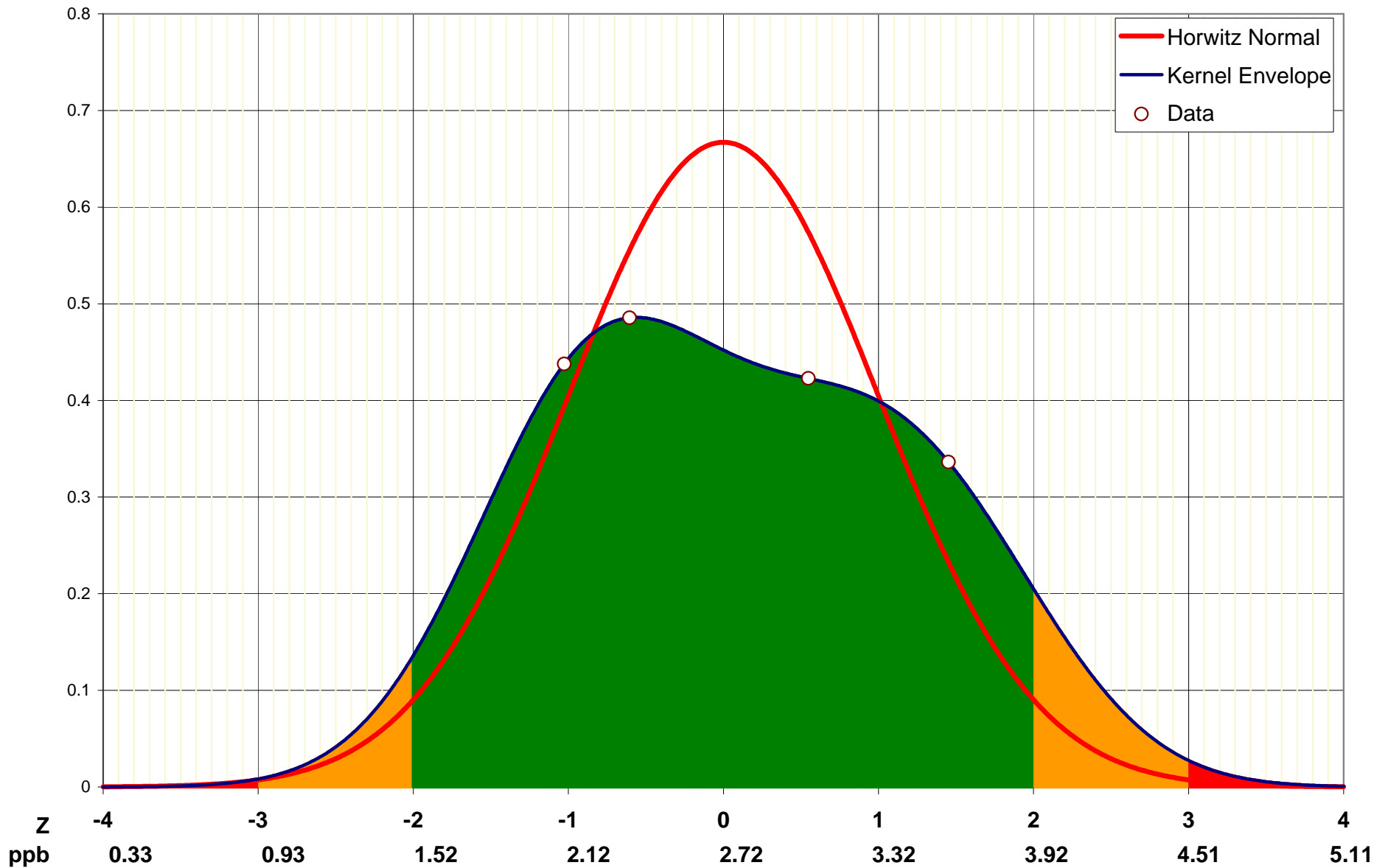
**# Methods Used** 2  
**Kernel Bandwidth** 1.22 (ppb)  
**Number of Non-Detects** 0  
**Number of Detects** 6

**Unique LOD's at:**

Note: Area Under the Kernel Envelope is Identical to Area Under Horwitz Normal Curve.

**AG1 (ppb) Code: 603 - In Sample # 201349, Prototype Test Data**  
**Kernel Density Envelope Detected Values Relative to Normal Horwitz Curve**

Issue Date: 01/01/2014

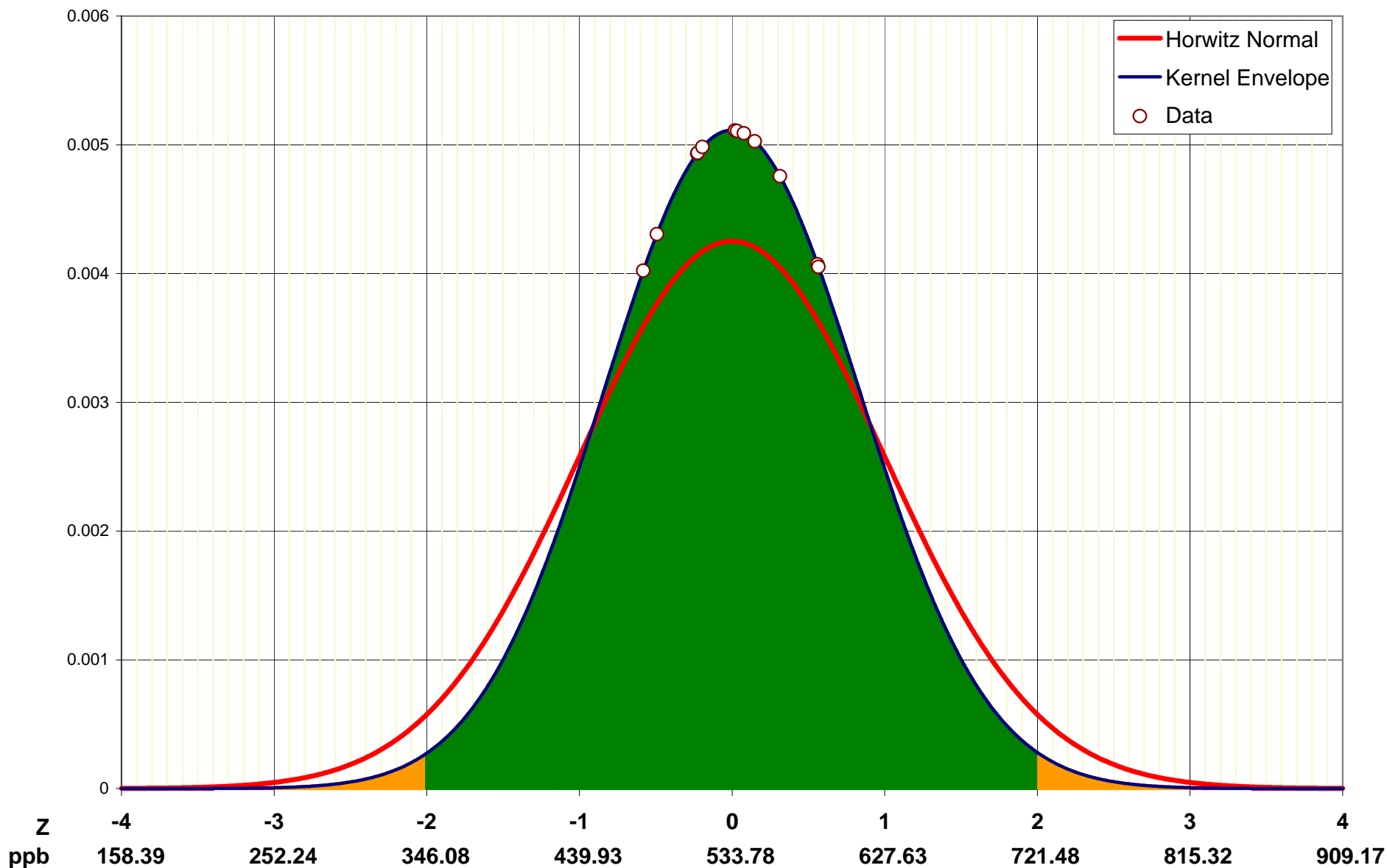


<b>Assigned Value</b>	<b>2.719 (ppb)</b>	<b># Methods Used</b>	<b>2</b>	<b>Unique LOD's at:</b>	<b>2.5 (ppb)</b>
<b>Horwitz SD</b>	<b>0.60 (ppb)</b>	<b>Kernel Bandwidth</b>	<b>0.45 (ppb)</b>		
<b>Participating Labs</b>	<b>3</b>	<b>Number of Non-Detects</b>	<b>2</b>		
		<b>Number of Detects</b>	<b>4</b>		

Note: Area Under the Kernel Envelope is Identical to Area Under Horwitz Normal Curve.

**Deoxynivalenol (ppb) Code: 610 - In Sample # 201349, Prototype Test Data**  
**Kernel Density Envelope Detected Values Relative to Normal Horwitz Curve**

Issue Date: 01/01/2014



**Assigned Value** 533.78 (ppb)  
**Horwitz SD** 93.85 (ppb)  
**Participating Labs** 5

**# Methods Used** 4  
**Kernel Bandwidth** 70.39 (ppb)  
**Number of Non-Detects** 0  
**Number of Detects** 12

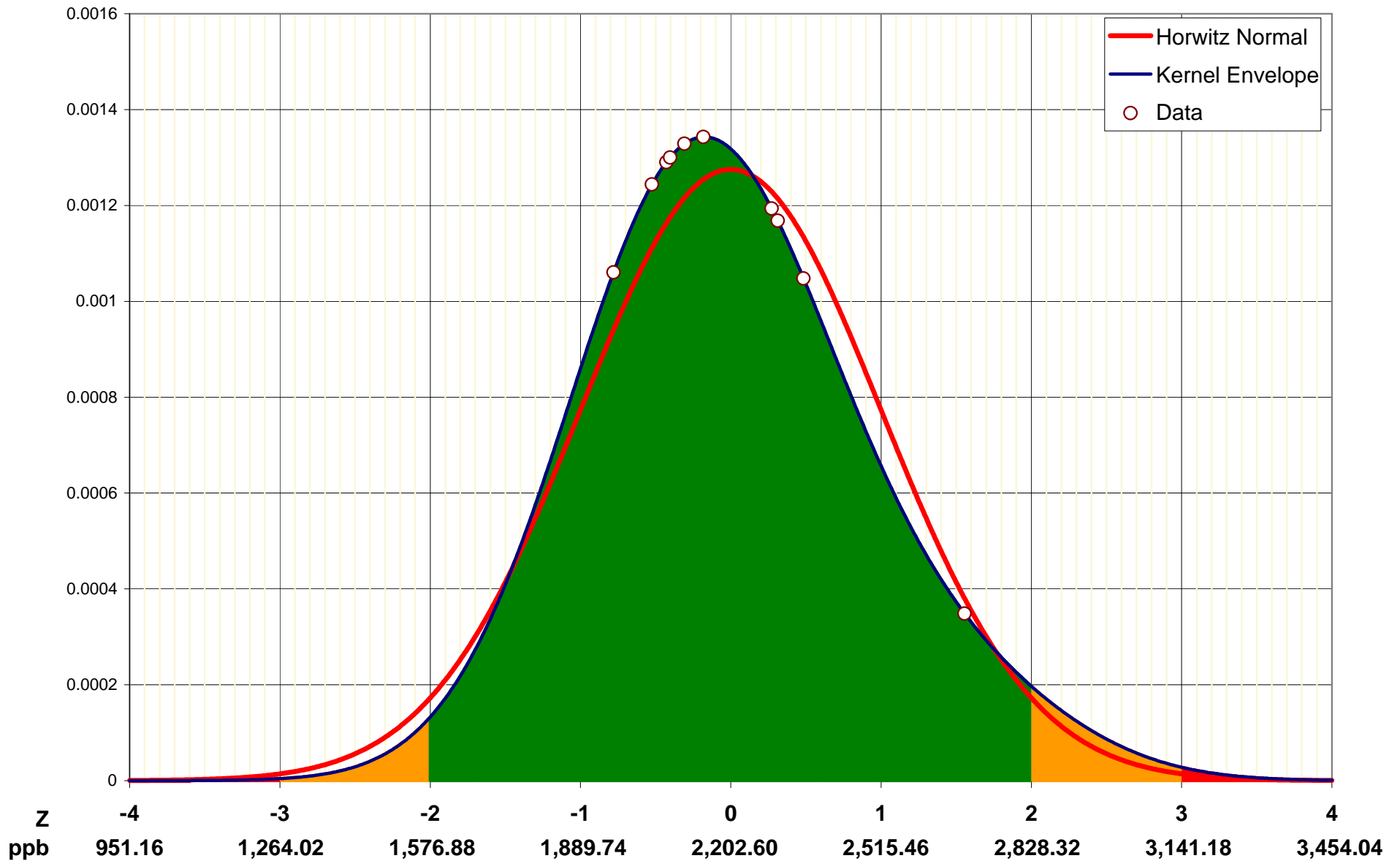
**Unique LOD's at:**

Note: Area Under the Kernel Envelope is Identical to Area Under Horwitz Normal Curve.



**Total Fumonisin (ppb) Code: 620 - In Sample # 201349, Prototype Test Data**  
**Kernel Density Envelope Detected Values Relative to Normal Horwitz Curve**

Issue Date: 01/01/2014



**Assigned Value** 2202.6 (ppb)  
**Horwitz SD** 312.86 (ppb)  
**Participating Labs** 4

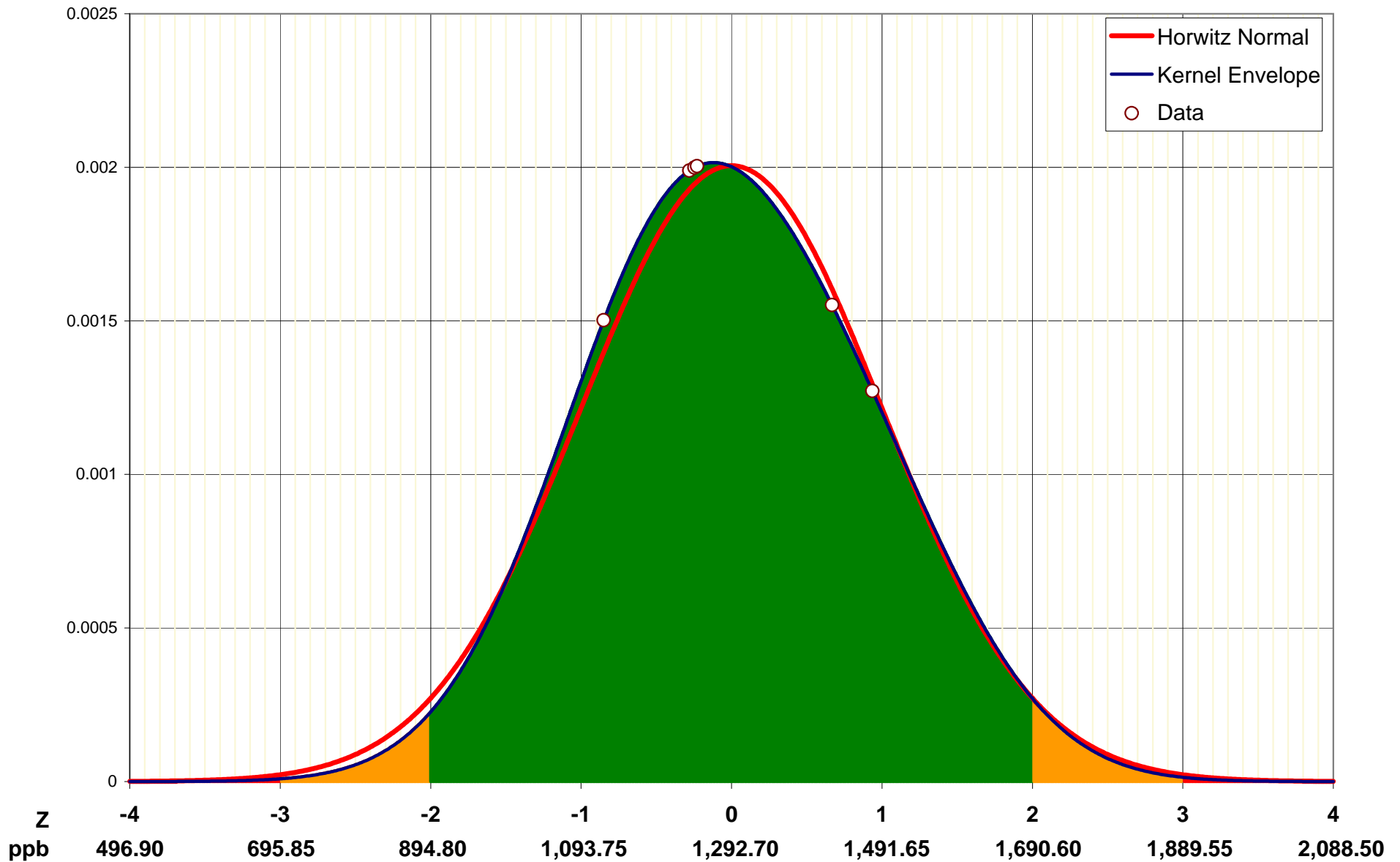
**# Methods Used** 3  
**Kernel Bandwidth** 234.65 (ppb)  
**Number of Non-Detects** 0  
**Number of Detects** 10

**Unique LOD's at:**

Note: Area Under the Kernel Envelope is Identical to Area Under Horwitz Normal Curve.

**FB1 (ppb) Code: 621 - In Sample # 201349, Prototype Test Data**  
**Kernel Density Envelope Detected Values Relative to Normal Horwitz Curve**

Issue Date: 01/01/2014

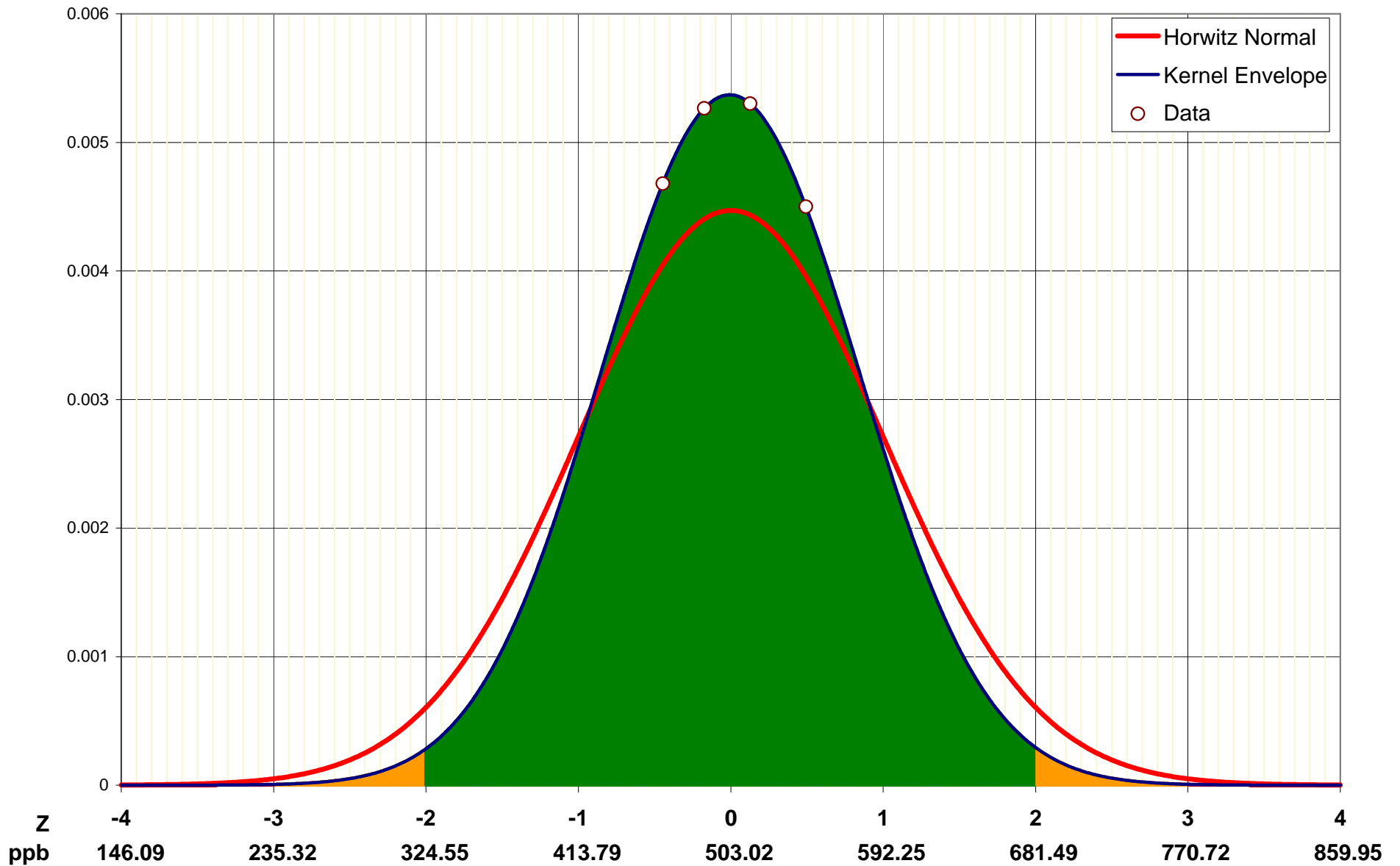


<b>Assigned Value</b>	<b>1292.7 (ppb)</b>	<b># Methods Used</b>	<b>3</b>	<b>Unique LOD's at:</b>
<b>Horwitz SD</b>	<b>198.95 (ppb)</b>	<b>Kernel Bandwidth</b>	<b>149.21 (ppb)</b>	
<b>Participating Labs</b>	<b>3</b>	<b>Number of Non-Detects</b>	<b>0</b>	
		<b>Number of Detects</b>	<b>6</b>	

Note: Area Under the Kernel Envelope is Identical to Area Under Horwitz Normal Curve.

**FB2 (ppb) Code: 622 - In Sample # 201349, Prototype Test Data**  
**Kernel Density Envelope Detected Values Relative to Normal Horwitz Curve**

Issue Date: 01/01/2014



**Assigned Value** 503.02 (ppb)  
**Horwitz SD** 89.23 (ppb)  
**Participating Labs** 2

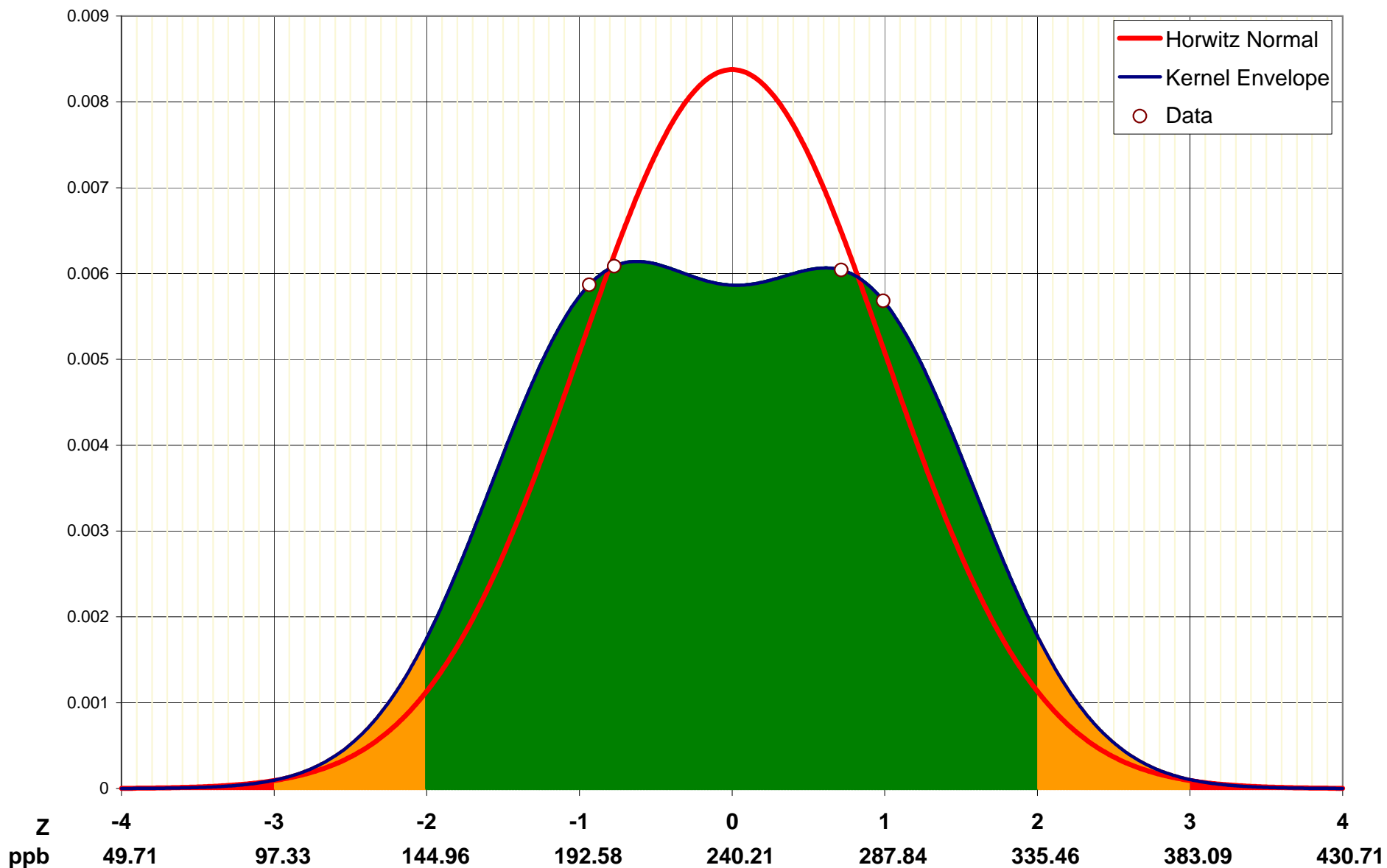
**# Methods Used** 2  
**Kernel Bandwidth** 66.92 (ppb)  
**Number of Non-Detects** 0  
**Number of Detects** 4

**Unique LOD's at:**

Note: Area Under the Kernel Envelope is Identical to Area Under Horwitz Normal Curve.

**FB3 (ppb) Code: 623 - In Sample # 201349, Prototype Test Data**  
**Kernel Density Envelope Detected Values Relative to Normal Horwitz Curve**

Issue Date: 01/01/2014



**Assigned Value** 240.21 (ppb)  
**Horwitz SD** 47.63 (ppb)  
**Participating Labs** 2

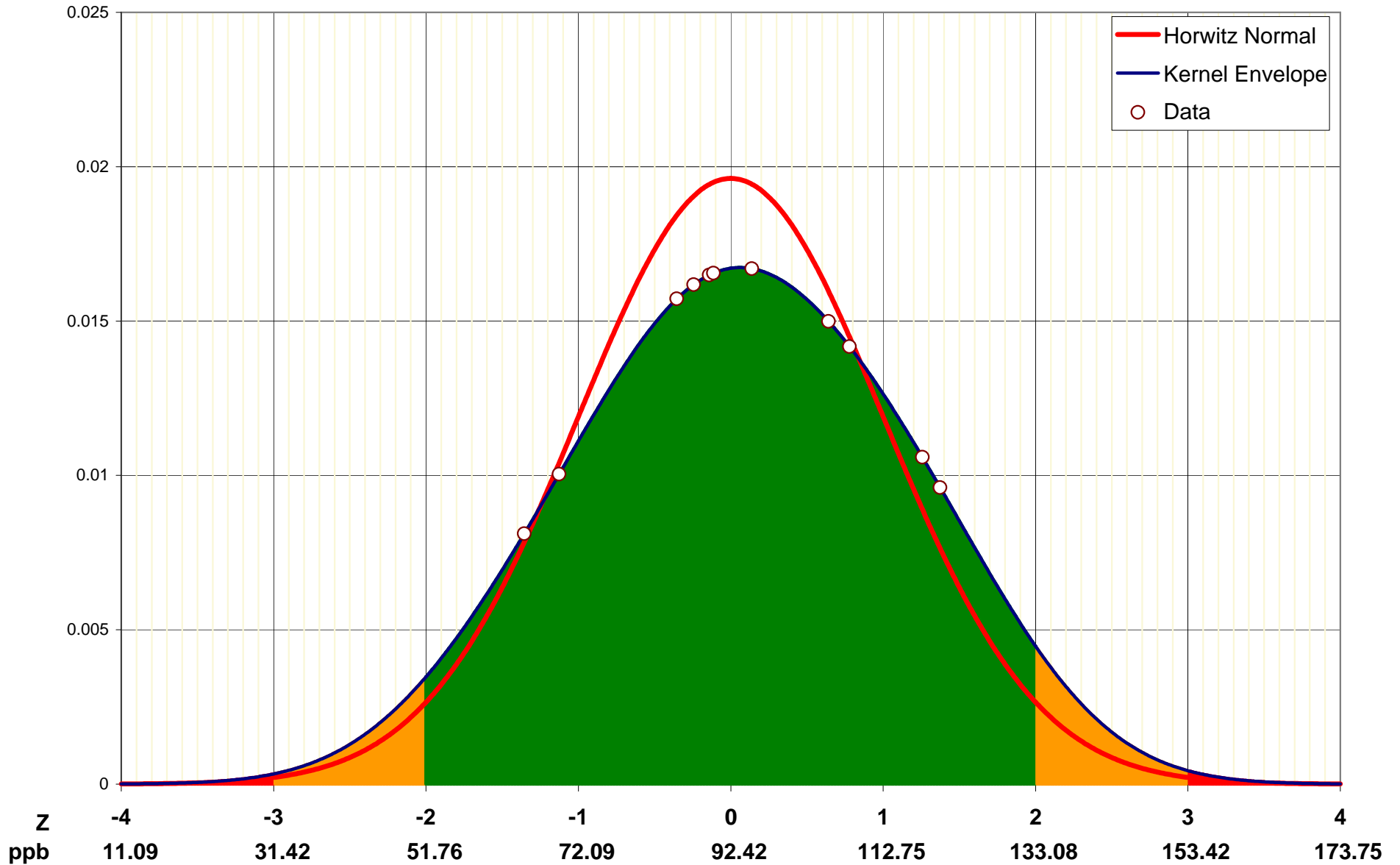
**# Methods Used** 2  
**Kernel Bandwidth** 35.72 (ppb)  
**Number of Non-Detects** 0  
**Number of Detects** 4

**Unique LOD's at:**

Note: Area Under the Kernel Envelope is Identical to Area Under Horwitz Normal Curve.

Ochratoxin A (ppb) Code: 630 - In Sample # 201349, Prototype Test Data  
 Kernel Density Envelope Detected Values Relative to Normal Horwitz Curve

Issue Date: 01/01/2014

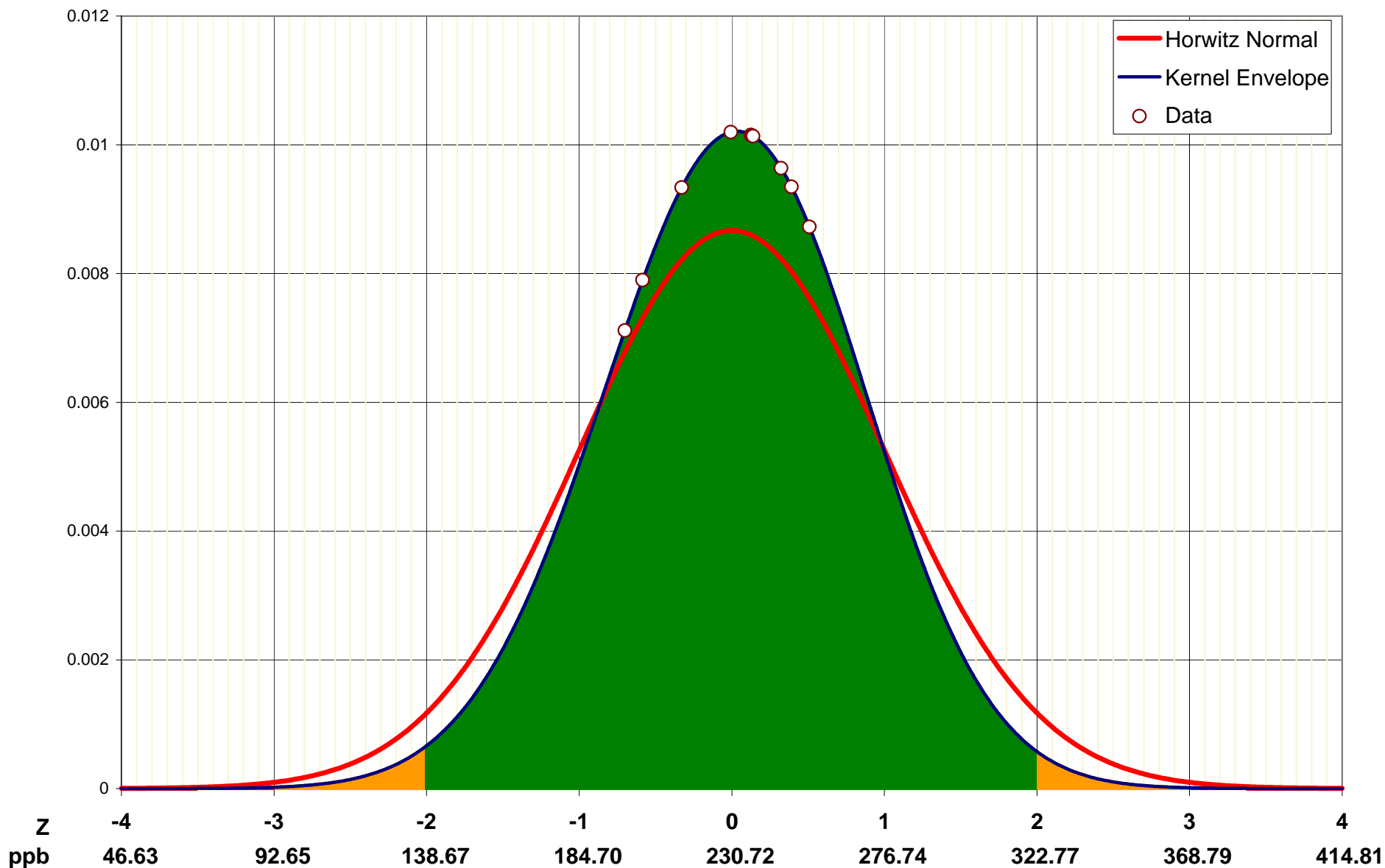


<b>Assigned Value</b>	<b>92.42 (ppb)</b>	<b># Methods Used</b>	<b>4</b>	<b>Unique LOD's at:</b>	<b>75 (ppb)</b>
<b>Horwitz SD</b>	<b>20.33 (ppb)</b>	<b>Kernel Bandwidth</b>	<b>15.25 (ppb)</b>		
<b>Participating Labs</b>	<b>5</b>	<b>Number of Non-Detects</b>	<b>1</b>		
		<b>Number of Detects</b>	<b>11</b>		

Note: Area Under the Kernel Envelope is Identical to Area Under Horwitz Normal Curve.

**T-2 (ppb) Code: 640 - In Sample # 201349, Prototype Test Data**  
**Kernel Density Envelope Detected Values Relative to Normal Horwitz Curve**

Issue Date: 01/01/2014



**Assigned Value** 230.72 (ppb)  
**Horwitz SD** 46.02 (ppb)  
**Participating Labs** 5

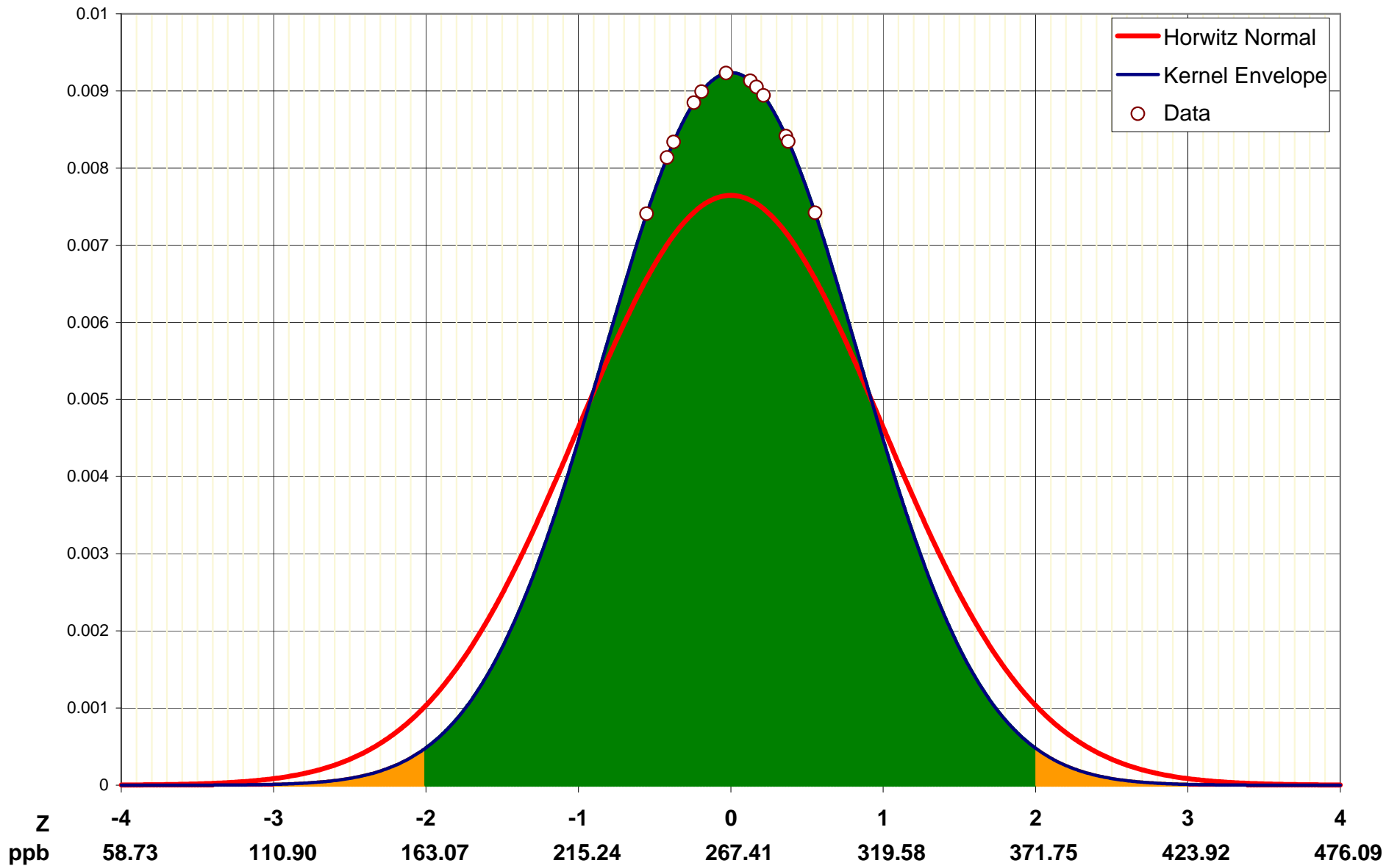
**# Methods Used** 4  
**Kernel Bandwidth** 34.52 (ppb)  
**Number of Non-Detects** 0  
**Number of Detects** 10

**Unique LOD's at:**

Note: Area Under the Kernel Envelope is Identical to Area Under Horwitz Normal Curve.

**Zearalenone (ppb) Code: 650 - In Sample # 201349, Prototype Test Data**  
**Kernel Density Envelope Detected Values Relative to Normal Horwitz Curve**

Issue Date: 01/01/2014



**Assigned Value** 267.41 (ppb)  
**Horwitz SD** 52.17 (ppb)  
**Participating Labs** 5

**# Methods Used** 4  
**Kernel Bandwidth** 39.13 (ppb)  
**Number of Non-Detects** 0  
**Number of Detects** 12

**Unique LOD's at:**

Note: Area Under the Kernel Envelope is Identical to Area Under Horwitz Normal Curve.