



The USDA/GIPSA Proficiency Program: A Summary of Participants Capabilities for Detecting and Quantifying Transgenic Events in Corn and Soybeans

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Grain Inspection, Packers and
Stockyards Administration
Technical Services Division**

Biotech Plants on the Market

- **Agronomic Traits**
 - **Herbicide resistance**
 - *Roundup Ready* soybeans, corn, canola
 - *Liberty Link* corn, canola
 - **Insect resistance**
 - *Yield-Gard* (Bt) corn
 - **Virus resistance**
 - *Freedom II* squash



Legislative Mandates and Benefit vs. Risk of Biotechnology Derived Events



- **United States**

- Substantial Equivalence

- Toxicity

- Nutritional Content

- Allergenicity

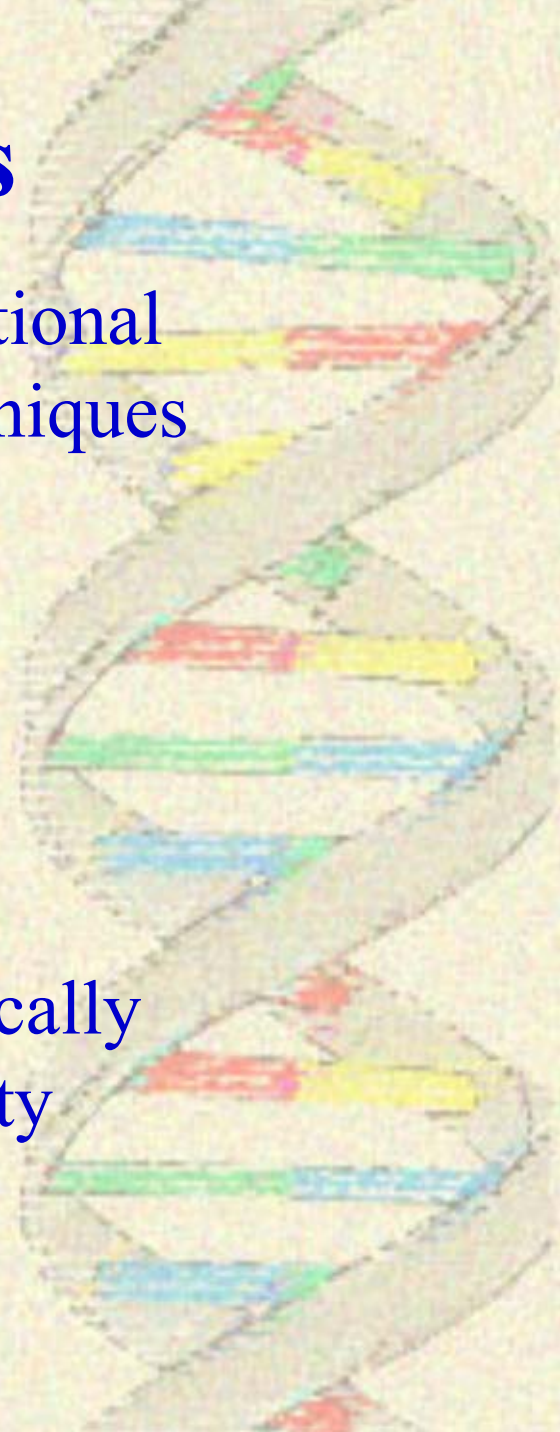
- **Europe**

- Consumer Choice (Perceived Risk)

- Labeling required if threshold above 0.9%

Grain Market Needs

- ◆ To distinguish biotech from conventional crops, the market needs testing techniques that are:
 - accurate
 - reliable
 - cost-effective
 - market compatible
- ◆ Testing will be combined synergistically with efficient and reliable IP (Identity Preservation) systems



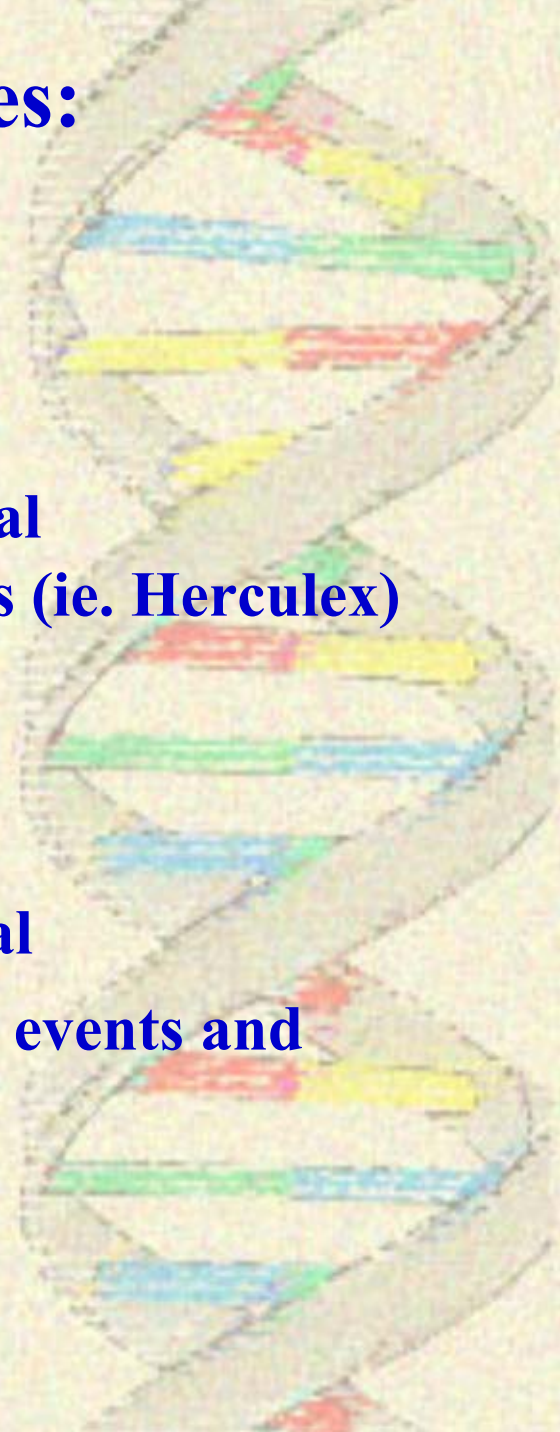
DNA-Based Testing Issues: Quantitation

35S and NOS

- **Multiple copies**
- **Units: % weight, % DNA material**
- **No recognized reference materials (ie. Herculex)**

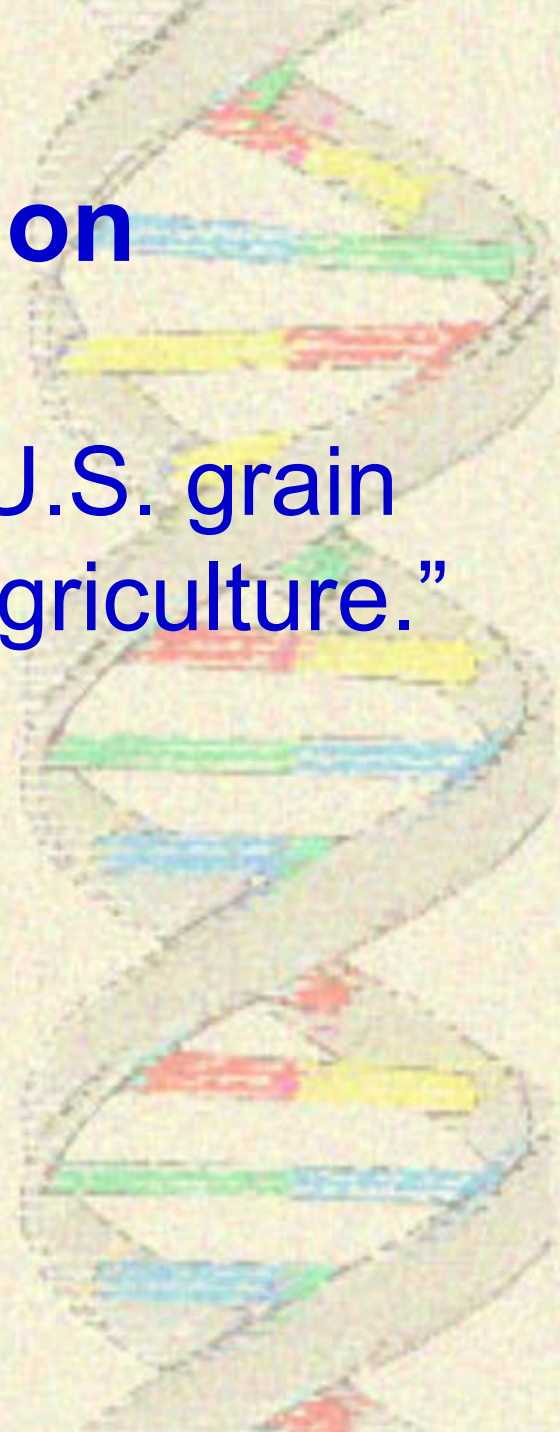
Event Specific

- **Multiple copies**
- **Units: % weight, % DNA material**
- **Cannot distinguish between single events and stacked events**
- **Technology limitations (PCR)**



GIPSA/FGIS' Mission

**“Facilitate the marketing of U.S. grain
for the benefit of American agriculture.”**



GIPSA Proficiency Program

**Voluntary: National and International
Participation from 119 organizations**

Bi-Annual dissemination of samples

- **First: February 2002**
- **Next: October 2005**

6 corn and 3 soybean samples

- **Two new events included
(Herculex, Mon 863)**
- **Qualitative or Quantitative**
- **0 to 5.0 % (corn) or 0 to 3.0 % (Soy)**

Results posted on GIPSA web page

GIPSA Proficiency Program Results

April 2005

Organization Capabilities Varied

60 Organizations Participated

-25 Provided Qualitative Only Results

7 reported results for all events

(3 were 100% correct)

-12 Quantitative Only Results

4 reported results for all events

(2 provided acceptable z-scores
for all events)

-23 Both Qualitative and Quantitative

8 reported results for all events

***Participants used a combination of DNA
and protein based tests**

Data Analysis Event T-25 (Liberty Link)

Individual Reported Values

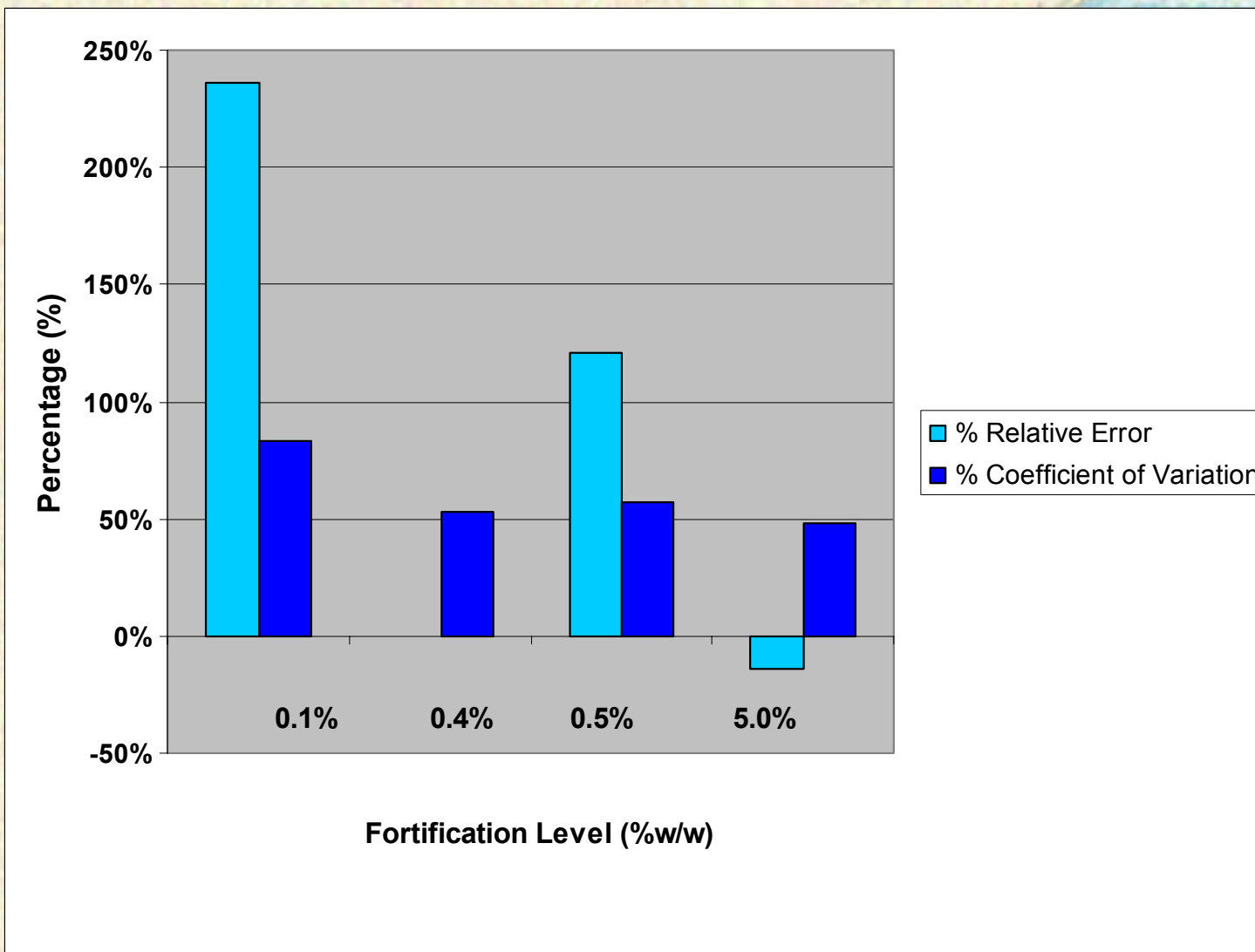
Z-Scores

Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 3	Sample 4	Sample 5	Sample 6
0.0%	0.0%	0.1%	0.5%	0.4%	5.0%	0.1%	0.5%	0.4%	5.0%
0.0	0.0	0.1	0.6	0.6	6.9	0.00	0.38	0.40	0.92
0.0	0.0	0.6	0.6	2.1	4.8	1.79	0.38	3.36	-0.10
0.0	0.0	1.1	0.5	1.5	5.7	3.58	0.00	2.18	0.34
0.0	0.0	0.5	0.3	0.6	3.4	1.43	-0.76	0.40	-0.78
0.0	0.0	0.1	0.1	0.8	1.5	0.00	-1.51	0.79	-1.70
0.0	0.00	0.10	0.40	0.40	4.92	0.00	-0.38	0.00	-0.04
0.0	0.0	0.4	0.8	0.7	3.7	1.08	1.14	0.59	-0.63
0.0	0.0	0.3	0.1	1.0	5.0	0.72	-1.51	1.19	0.00
	0.00	0.30	0.30	0.60		0.72	-0.76	0.40	
0.0	0.00	0.64	0.44	1.20	5.84	1.94	-0.23	1.58	0.41
0.0	0.0	0.1	0.4	0.2	3.0	0.00	-0.38	-0.40	-0.97
0.0	0.0	0.0	0.4	0.4	0.4	-0.36	-0.38	0.00	-2.24
0.0	0.0	0.3	0.5	1.2	1.5	0.72	0.00	1.58	-1.70
0.0	0.00	0.15	0.60	0.40	5.00	0.18	0.38	0.00	0.00
0.0	0.85	0.4	0.8	1.0	4.9	1.18	1.17	1.23	-0.07
0.0	0.0	0.25	1.13	1.42	7.82	0.54	2.39	2.02	1.37

Statistical Analysis T-25 (Liberty Link)

n	15	16	16	16	16	15
Actual	0.00	0.00	0.10	0.50	0.40	5.00
Mean	0.00	0.05	0.34	0.50	0.88	4.29
STD	0.00	0.21	0.28	0.26	0.51	2.06
CV	NA	4.00	0.83	0.53	0.57	0.48
RSD	NA	400%	83%	53%	57%	48%
% Relative Error	NA	NA	236%	0%	121%	-14%
Range						
Min	0.00	0.00	0.00	0.10	0.20	0.40
Max	0.00	0.85	1.10	1.13	2.10	7.82

T-25 (Liberty Link)



Data Analysis Event Mon810

Individual Reported Values

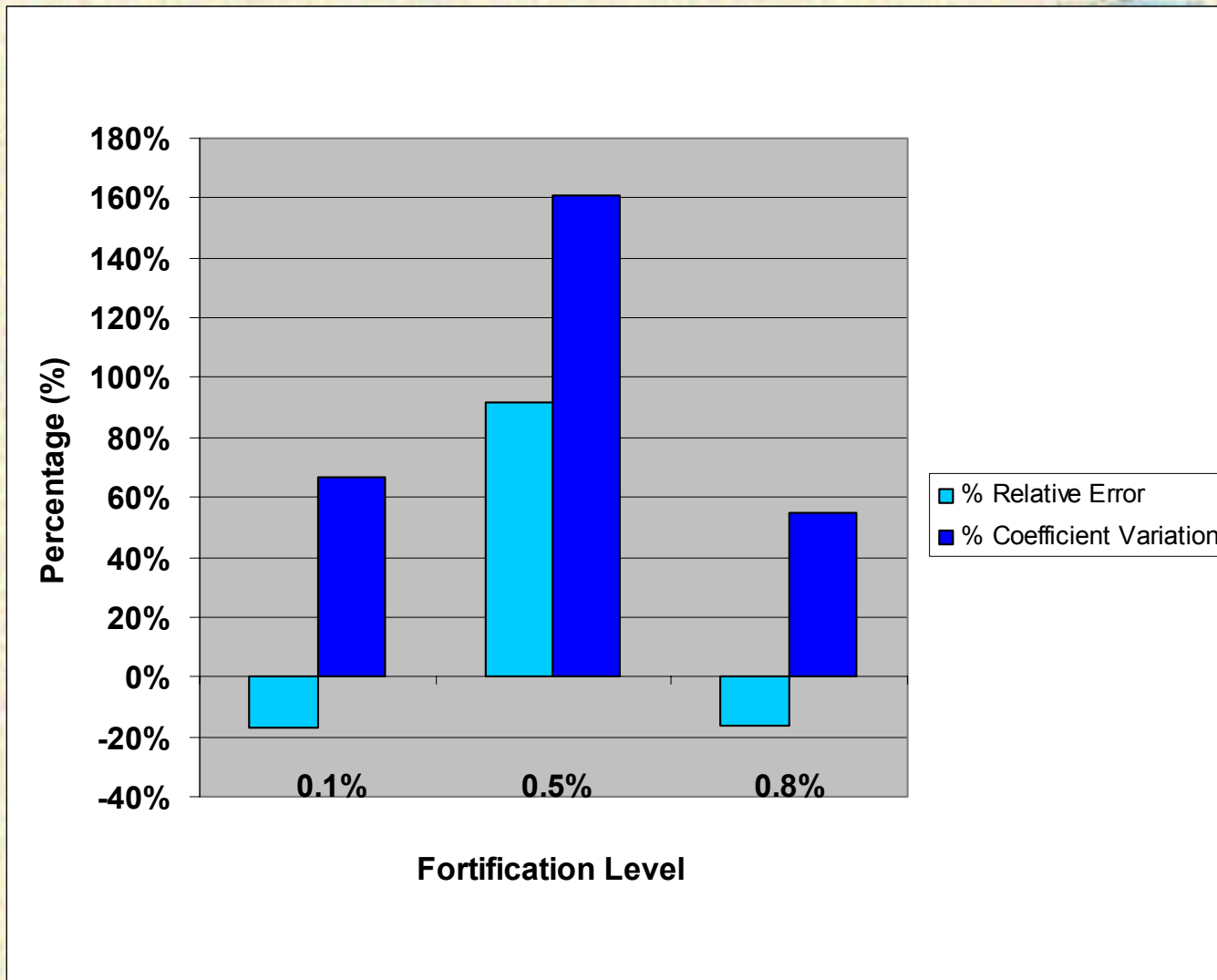
Z-Scores

Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 2	Sample 5	Sample 6
0.0%	0.1%	0.0%	0.0%	0.8%	0.5%	0.1%	0.8%	0.5%
0.0	0.1	0.0	0.0	0.6	0.2	0.00	-0.54	-0.19
0.0	0.2	0.0	0.0	1.6	4.8	1.80	2.14	2.77
0.0	0.1	0.0	0.0	0.6	0.3	0.00	-0.54	-0.13
0.0	0.0	0.0	0.0	0.28	0.31	-1.80	-1.39	-0.12
0.0	0.1	0.0	0.0	0.8	0.3	0.00	0.00	-0.13
0.0	0.1	0.0	0.0	0.8	0.8	0.00	0.00	0.19
0.0	0.10	0.00	0.00	0.80	0.40	0.00	0.00	-0.06
0.0	0.1	0.0	0.0	0.4	0.3	0.00	-1.07	-0.13
0.0	0.00	0.00	0.0	0.40	0.27	-1.80	-1.07	-0.15
0.0	0.1	0.0	0.0	0.7	0.3	0.00	-0.27	-0.13
0.0	0.1	0.0	0.0	0.5	0.3	0.00	-0.80	-0.13
	0.00	0.00	0.00	0.40		-1.80	-1.07	
0.0	0.1	0.0	0.0	0.5	0.5	0.00	-0.80	0.00
0.0	0.0	0.0	0.0	0.9	0.4	-1.80	0.27	-0.06
0.0	0.06	0.00	0.00	0.82	0.26	-0.72	0.05	-0.15
0.0	0.1	0.0	0.0	1.2	0.8	0.00	1.07	0.19
0.0	0.2	0.0	0.8	0.0	0.2	1.80	-2.14	-0.19
0.0	0.1	0.0	0.0	0.9	0.3	0.00	0.27	-0.13
0.0	0.09	0.11	0.26	0.35	0.90	-0.18	-1.20	0.26
0.0	0.0	0.19	1.05	1.38	5.80	-1.80	1.55	3.42
0.0	0.1	0.0	0.0	0.9	3.2	0.18	0.24	1.76
0.0	0.05	0.00	0.00	0.31	0.15	-0.90	-1.31	-0.23
0.0	0.10	0.0	0.0	0.4	0.30	0.00	-1.07	-0.13

Statistical Analysis Mon810

n	22	23	22	23	23	22
Actual	0.0	0.1	0.0	0.0	0.8	0.5
Mean	0.00	0.08	0.01	0.09	0.68	0.96
STD	0.00	0.06	0.05	0.27	0.37	1.55
CV	NA	0.67	3.36	2.95	0.55	1.61
RSD	NA	67%	336%	295%	55%	161%
% Relative Error	NA	-17%	NA	NA	-16%	92%
Range						
Min	0.00	0.00	0.00	0.00	0.00	0.15
Max	0.00	0.20	0.19	1.05	1.60	5.80

Mon810



Data Analysis CBH 351

Individual Reported Values

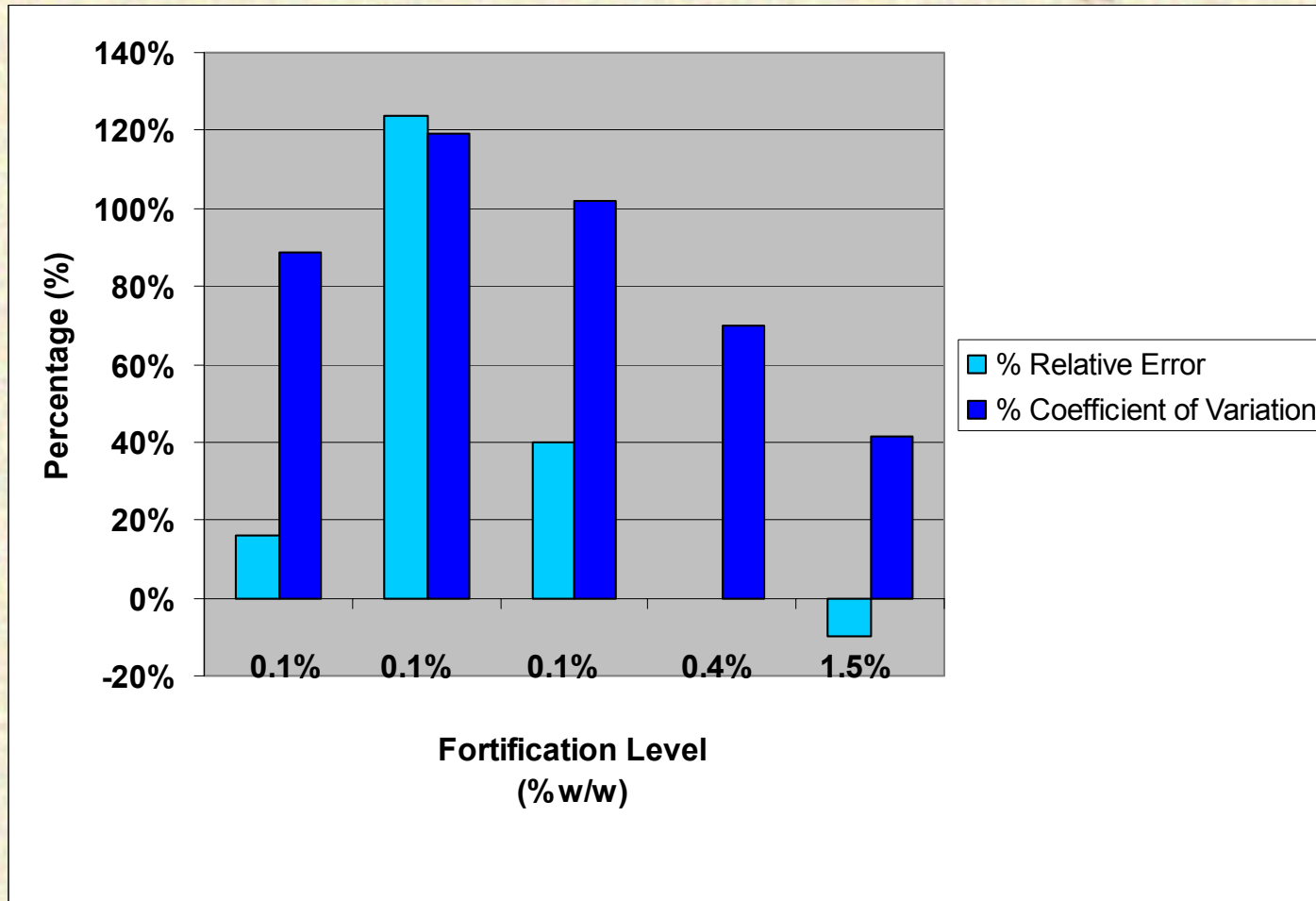
Z-Scores

Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6
0.0%	0.1%	0.1%	0.1%	0.4%	1.5%	0.1%	0.1%	0.1%	0.4%	1.5%
0.0	0.1	0.1	0.1	0.4	1.5	0.00	0.00	0.00	0.00	0.00
0.0	0.0	0.1	0.1	0.2	0.8	-0.97	0.00	0.00	-0.72	-1.25
0.0	0.3	0.8	0.5	0.5	1.6	1.95	2.62	2.80	0.36	0.18
0.0	0.3	0.6	0.2	1.1		1.95	1.87	0.70	2.51	
0.0	0.1	0.3	0.1	0.5	1.5	0.00	0.75	0.00	0.36	0.00
0.0	0.06	0.12	0.00	0.28	1.34	-0.39	0.07	-0.70	-0.43	-0.29
0.0	0.1	0.1	0.1	0.2	1.5	0.00	0.00	0.00	-0.72	0.00
0.2	0.1	0.0	0.0	0.1	0.4	0.00	-0.37	-0.70	-1.08	-1.97
0.0	0.07	0.07	0.20	0.40	2.40	-0.29	-0.11	0.70	0.00	1.61
0.0	0.03	0.05	0.10	0.32	1.12	-0.68	-0.19	0.00	-0.29	-0.68

Statistical Analysis CBH351

n	10	10	10	10	10	9
Actual	0.0	0.1	0.1	0.1	0.4	1.5
Mean	0.02	0.12	0.22	0.14	0.40	1.35
STD	0.06	0.10	0.27	0.14	0.28	0.56
CV	3.16	0.88	1.19	1.02	0.70	0.41
RSD	316%	88%	119%	102%	70%	41%
% Relative Error	NA	16%	124%	40%	0%	-10%
Range						
Min	0.00	0.00	0.00	0.00	0.10	0.40
Max	0.20	0.30	0.80	0.50	1.10	2.40

Graph CBH 351



Data Analysis GA21

Individual Reported Values

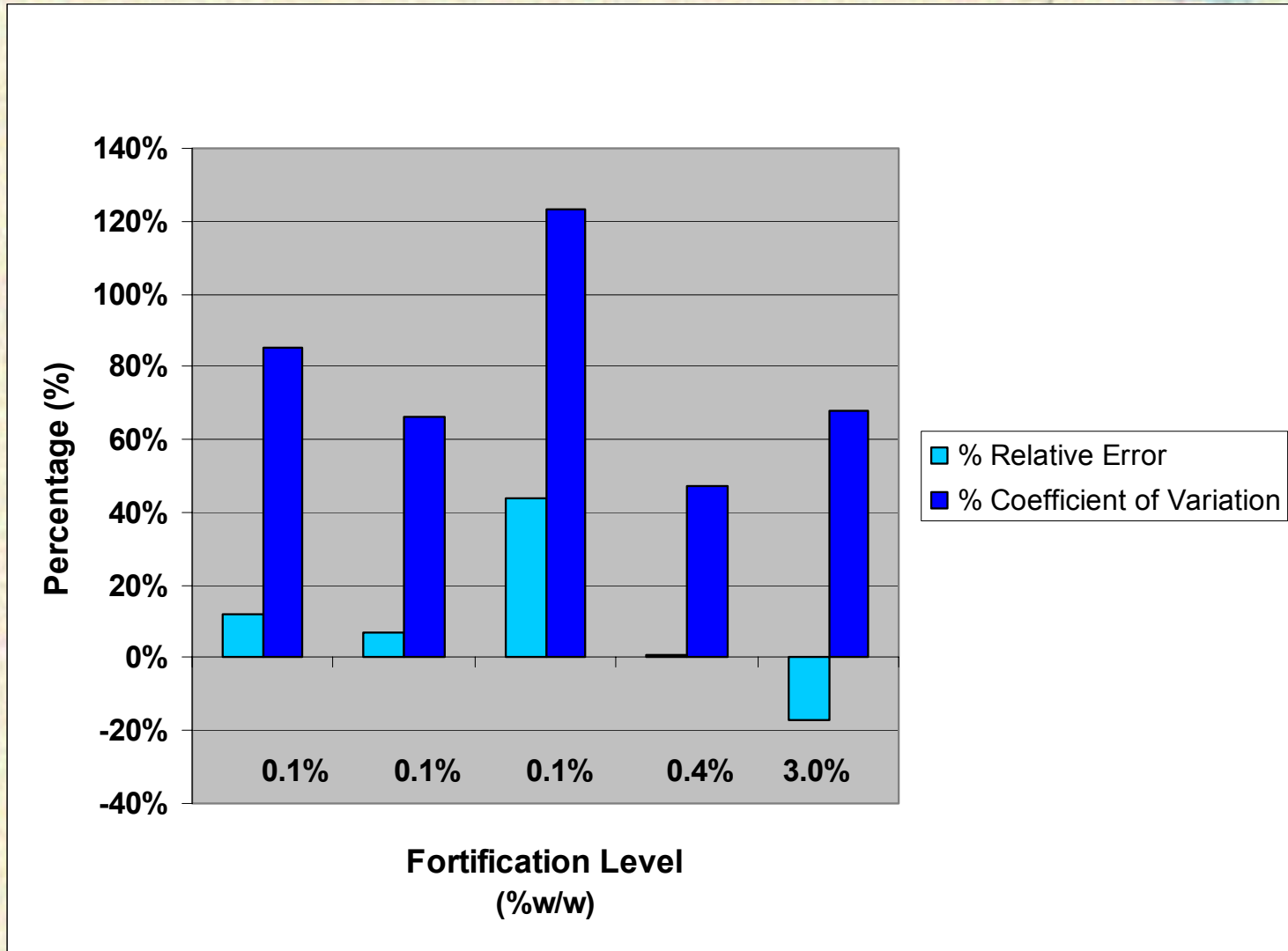
Z-Scores

Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6
0.0%	0.1%	0.1%	3.0%	0.4%	0.1%	0.0	0.1%	0.1%	3.0%	0.4%	0.1%
0.0	0.2	0.2	3.3	0.5	0.1	0.00	1.34	1.41	0.18	0.53	0.00
0.0	0.1	0.1	2.7	0.3	0.1	0.00	0.00	0.00	-0.18	-0.53	0.00
0.0	0.1	0.1	2.2	0.3	0.1	0.00	0.00	0.00	-0.48	-0.53	0.00
0.0	0.1	0.1	1.7	0.4	0.1	0.00	0.00	0.00	-0.78	0.00	0.00
0.0	0.1	0.1	3.0	0.4	0.1	0.00	0.00	0.00	0.00	0.00	0.00
0.0	0.1	0.1	1.8	0.3	0.1	0.00	0.00	0.00	-0.72	-0.53	0.00
0.0	0.10	0.10	2.16	0.39	0.10	0.00	0.00	0.00	-0.50	-0.05	0.00
0.0	0.0	0.0	2.8	0.4	0.1	0.00	-1.34	-1.41	-0.12	0.00	0.00
0.0	0.3	0.2	3.0	0.5	0.1	0.00	2.67	1.41	0.00	0.53	0.00
0.0	0.1	0.2	4.1	0.1	0.15	0.00	0.00	1.41	0.66	-1.58	0.28
	0.0	0.0	2.0	0.38			-1.34	-1.41	-0.60	-0.11	
0.0	0.0	0.0	1.9	0.2	0.0	0.00	-1.34	-1.41	-0.66	-1.05	-0.56
0.0	0.12	0.20	2.32	0.50	0.12	0.00	0.27	1.41	-0.41	0.53	0.11
0.0	0.1	0.1	2.0	0.4	0.1	0.00	0.00	0.00	-0.60	0.00	0.00
0.4	0.0	0.2	0.4	0.4	0.8	4.36	-1.34	1.41	-1.55	0.00	3.94
0.0	0.0	0.0	2.0	0.4	0.4	0.00	-1.34	-1.41	-0.60	0.00	1.69
0.0	0.10	0.10	0.60	0.40	0.04	0.00	0.00	0.00	-1.43	0.00	-0.34
0.0	0.2	0.14	8.50	0.95	0.14	0.00	0.67	0.56	3.28	2.90	0.23
0.0	0.06	0.09	2.23	0.72	0.07	0.00	-0.53	-0.14	-0.46	1.68	-0.17
0.0	0.03		0.8	0.1	0.02	0.00	-0.93		-1.31	-1.58	-0.45

Statistical Analysis GA21

n	19	20	19	20	20	19
Actual	0.0	0.1	0.1	3.0	0.4	0.1
Mean	0.02	0.09	0.11	2.48	0.40	0.14
STD	0.09	0.07	0.07	1.67	0.19	0.18
CV	4.36	0.85	0.66	0.68	0.47	1.23
RSD	436%	85%	66%	68%	47%	123%
% Relative Error	NA	12%	7%	-17%	1%	44%
Range						
Min	0.00	0.00	0.00	0.40	0.10	0.00
Max	0.40	0.30	0.20	8.50	0.95	0.80

Graph GA21



Data Analysis Bt-176

Individual Reported Values

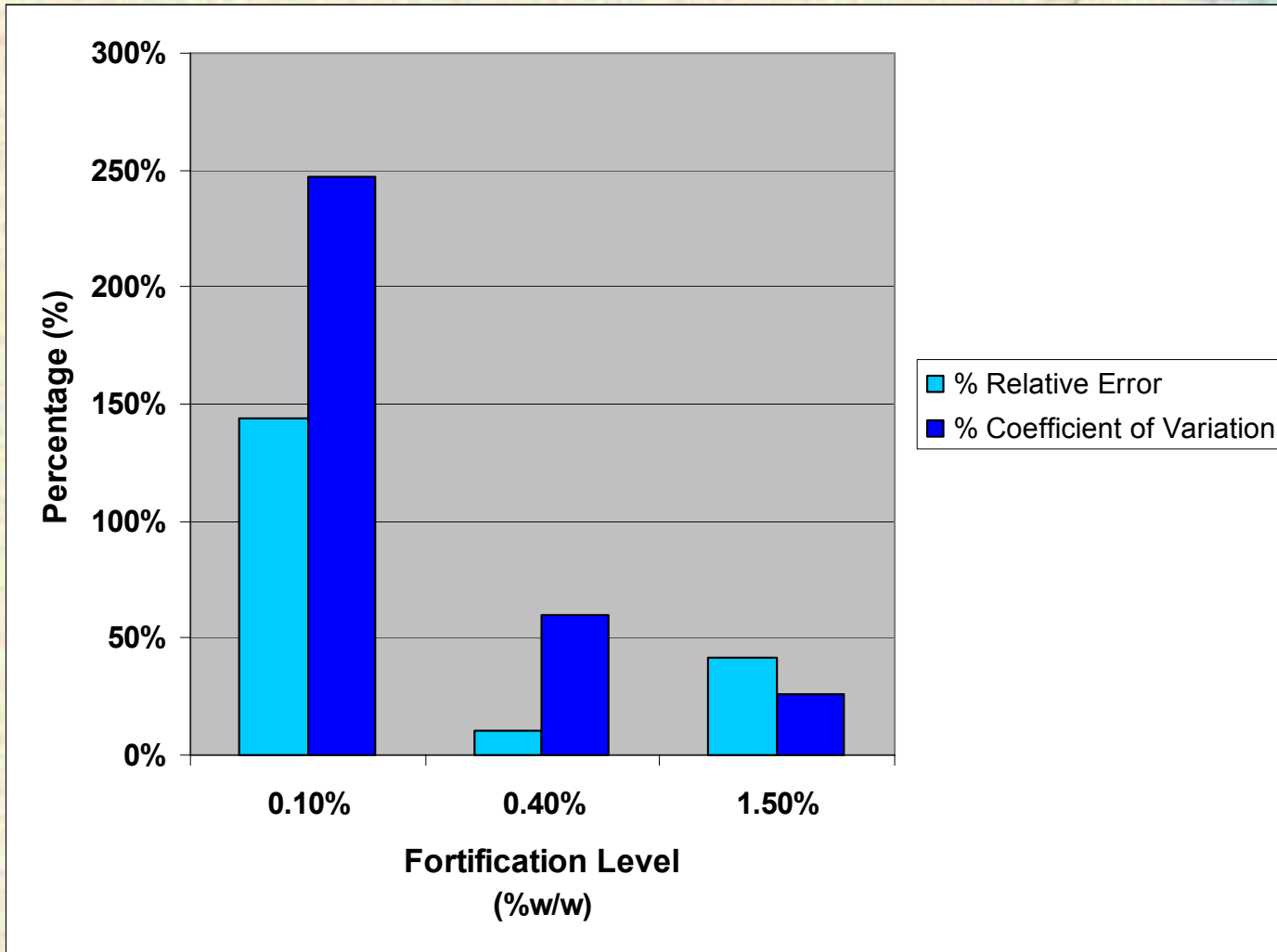
Z-Scores

Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 2	Sample 4	Sample 5
0.0%	0.1%	0.0%	1.5%	0.4%	0.0%	0.1%	1.5%	0.4%
0.0	0.1	0.0	0.8	0.3	0.0	0.00	-1.49	-0.38
0.0	0.1	0.0	1.0	0.3	0.0	0.00	-1.07	-0.38
0.0	0.1	0.0	1.1	0.4	0.0	0.00	-0.85	0.00
0.0	0.1	0.0	1.0	0.4	0.0	0.00	-1.07	0.00
0.0	0.1	0.0	0.8	0.4	0.0	0.00	-1.49	0.00
0.0	0.11	0.00	0.86	0.35	0.00	0.02	-1.36	-0.19
0.0	0.0	0.0	1.8	0.6	0.0	-0.17	0.64	0.76
0.0	0.11	0.00	1.7	0.25	0.00	0.02	0.43	-0.57
0.0	0.1	0.1	0.7	0.3	0.0	0.00	-1.70	-0.38
0.0	0.1	0.0	1.4	0.8	0.0	0.00	-0.21	1.52
	0.10	0.00	1.40	0.40		0.00	-0.21	0.00
0.0	0.5	0.0	1.6	1.2	0.0	0.66	0.21	3.03
0.0	0.0	0.0	0.5	0.2	0.0	-0.17	-2.13	-0.76
0.0	0.22	0.00	2.34	0.68	0.00	0.20	1.79	1.06
0.0	0.2	0.0	1.5	0.4	0.0	0.17	0.00	0.00
0.4	0.2	0.0	0.4	0.4	0.4	0.17	-2.34	0.00
0.0	2.9	0.0	1.0	1.0	0.0	4.65	-1.07	2.27
0.0	0.07	0.00	1.20	0.40	0.00	-0.05	-0.64	0.00
0.0	0.0	0.00	1.00	0.23	0.00	-0.17	-1.07	-0.64
0.0	0.1	0.0	0.5	0.2	0.0	-0.08	-2.07	-0.91
0.0	0.13	0.00	0.95	0.23	0.00	0.05	-1.17	-0.64
0.0	0.08		1.0	0.3	0.00	-0.03	-1.07	-0.38

Statistical Analysis Bt 176

n	21	22	21	22	22	20
Actual	0.0	0.1	0.0	1.5	0.4	0.0
Mean	0.02	0.24	0.00	1.12	0.44	0.02
STD	0.09	0.60	0.02	0.47	0.26	0.09
CV	4.58	2.47	4.58	0.42	0.60	4.47
RSD	458%	247%	458%	42%	60%	447%
% Relative Error	NA	144%	NA	26%	10%	NA
Range						
Min	0.00	0.00	0.00	0.40	0.16	0.00
Max	0.40	2.90	0.10	2.34	1.20	0.40

Graph Bt 176



Data Analysis NK603

Individual Reported Values

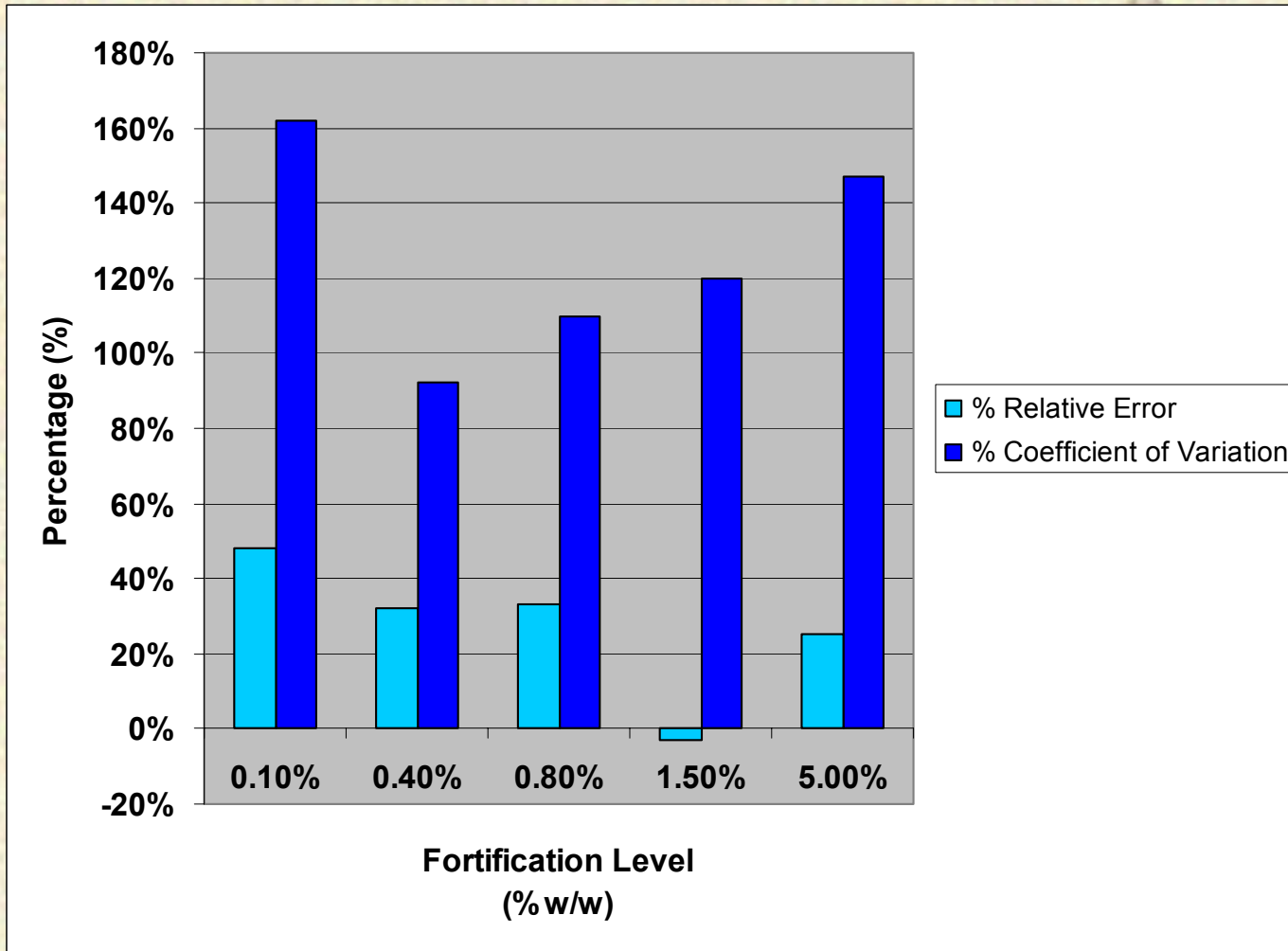
Z-Scores

Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6
0.0%	0.1%	0.4%	1.5%	0.8%	5.0%	0.0	0.1%	0.4%	1.5%	0.8%	5.0%
0.0	0.1	0.3	0.8	0.7	3.4	0.00	0.00	-0.21	-0.40	-0.09	-0.17
0.0	0.1	0.7	1.1	0.9	4.7	0.00	0.00	0.62	-0.23	0.09	-0.03
0.0	0.1	0.7	0.8	0.6	4.1	0.00	0.00	0.62	-0.40	-0.17	-0.10
0.0	0.11	0.63	1.04	0.84	5.28	0.00	0.04	0.48	-0.26	0.03	0.03
0.0	0.0	0.2	0.8	0.5	3.0	0.00	-0.42	-0.41	-0.40	-0.26	-0.22
0.0	0.1	0.0	2.0	0.6	4.0	0.00	0.00	-0.83	0.28	-0.17	-0.11
0.0	0.1	0.5	1.2	0.8	4.4	0.00	0.00	0.21	-0.17	0.00	-0.07
	0.10	0.36	1.10	0.80			0.00	-0.08	-0.23	0.00	
0.0	0.10	0.64	1.18	1.24	6.02	0.00	0.00	0.50	-0.18	0.38	0.11
0.0	1.0	0.4	1.0	0.8	3.0	0.00	3.75	0.00	-0.28	0.00	-0.22
0.4	0.0	0.2	0.4	0.4	0.8	3.87	-0.42	-0.41	-0.63	-0.34	-0.46
0.0	0.0	0.5	1.3	1.4	4.0	0.00	-0.42	0.21	-0.11	0.51	-0.11
0.0	0.06	0.30	0.50	0.40	1.00	0.00	-0.17	-0.21	-0.57	-0.34	-0.44
0.0	0.34	2.11	7.90	5.33	39.00	0.00	1.00	3.55	3.65	3.88	3.70
0.0	0.1	0.4	1.1	0.8	5.8	0.00	-0.17	-0.08	-0.23	0.01	0.09
0.0	0.10		1.1	0.9	5.00	0.00	0.00		-0.23	0.09	0.00

Statistical Analysis NK603

n	15	16	16	15	16	15
Actual	0.0	0.1	0.4	1.5	0.8	5.0
Mean	.03	0.15	0.53	1.46	1.06	6.23
STD	1.00	0.24	0.48	1.76	1.17	9.19
CV	3.81	1.62	0.92	1.21	1.10	1.47
RSD	381%	162%	92%	121%	110%	147%
% Relative Error	NA	50%	33%	-3%	33%	25%
Range						
Min	0.00	0.00	0.00	0.40	0.40	0.80
Max	0.40	1.00	2.11	7.90	5.33	39.00

Graph NK603



Data Analysis Herculex (TC1507)

Individual Reported Values

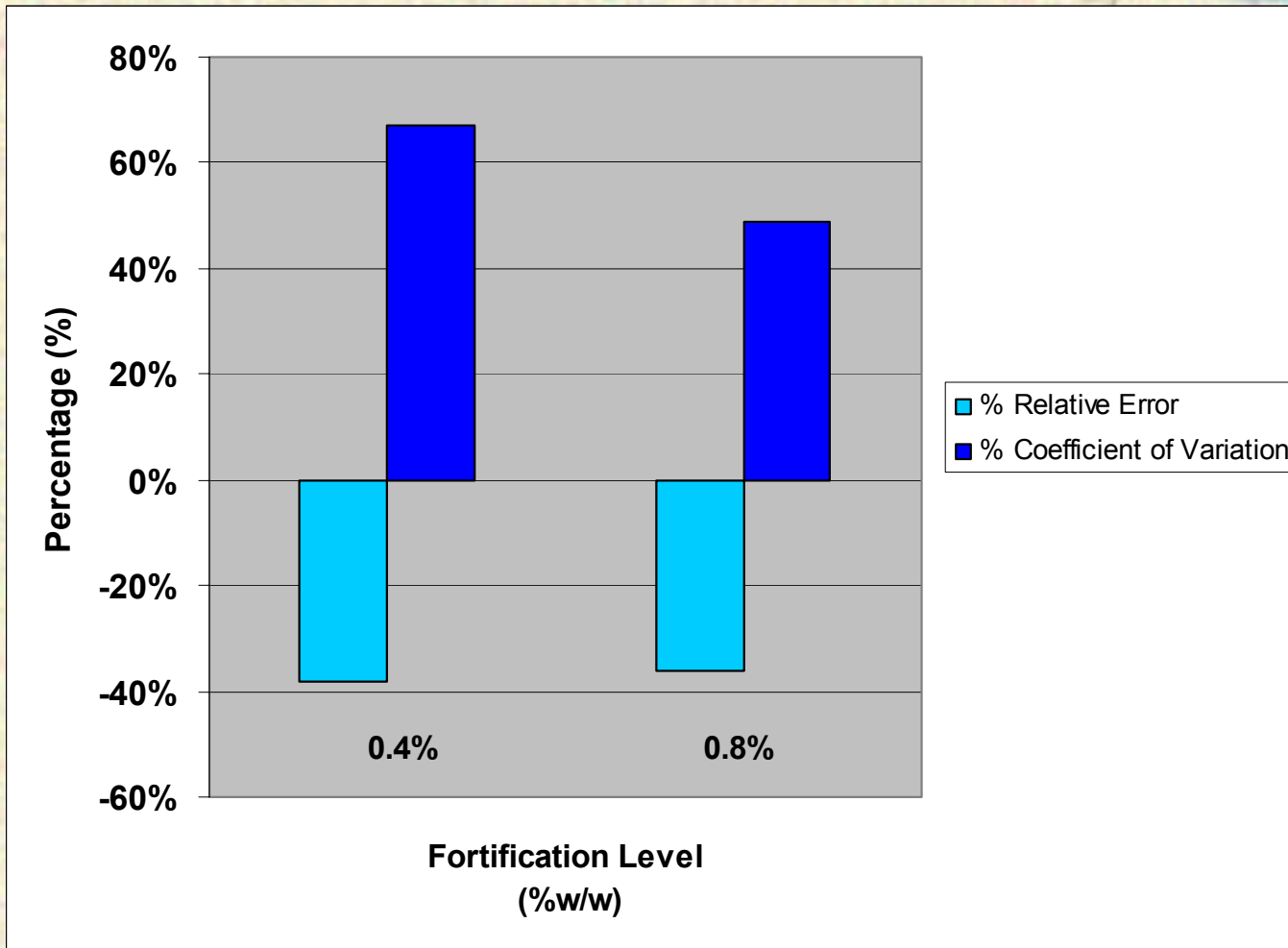
Z-Scores

Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 1	Sample 3	Sample 4	Sample 5
0.0%	0.0%	0.4%	0.0%	0.8%	0.0%	0.0	0.4%	0.0%	0.8%
0.0	0.0	0.3	0.0	0.6	0.0	0.00	-0.60	0.00	-0.79
0.0	0.0	0.3	0.0	0.7	0.0	0.00	-0.60	0.00	-0.40
0.0	0.00	0.42	0.00	0.75	0.00	0.00	0.12	0.00	-0.20
0.0	0.0	0.1	0.0	0.3	0.0	0.00	-1.80	0.00	-1.99
0.0	0.0	0.1	0.0	0.2	0.0	0.00	-1.80	0.00	-2.38
0.0	0.0	0.5	0.0	0.8	0.0	0.00	0.60	0.00	0.00
0.0	0.0	0.4	0.0	0.8	0.0	0.00	0.00	0.00	0.00
0.8	0.0	0.0	0.2	0.4	0.0	3.46	-2.41	3.46	-1.59
0.0	0.0	0.2	0.0	0.5	0.0	0.00	-1.20	0.00	-1.19
0.0	0.00	0.27	0.00	0.45	0.00	0.00	-0.78	0.00	-1.39
0.0	0.00	0.37	0.00	0.65	0.00	0.00	-0.18	0.00	-0.60

Statistical Analysis Herculex (TC1507)

n	12	12	12	12	12	12
Actual	0.0	0.0	0.4	0.0	0.8	0.0
Mean	0.07	0.00	0.25	0.02	0.51	0.00
STD	0.23	0.00	0.17	0.06	0.25	0.00
CV	3.46	NA	0.68	3.46	0.49	NA
RSD	346%	NA	68%	346%	49%	NA
% Relative Error	NA	NA	-38%	NA	-36%	NA
Range						
Min	0.00	-2.38	0.00	0.00	0.00	0.00
Max	3.46	0.00	0.00	0.00	0.00	0.00

Graph Herculex (TC1507)



Data Analysis Bt-11

Individual Reported Values

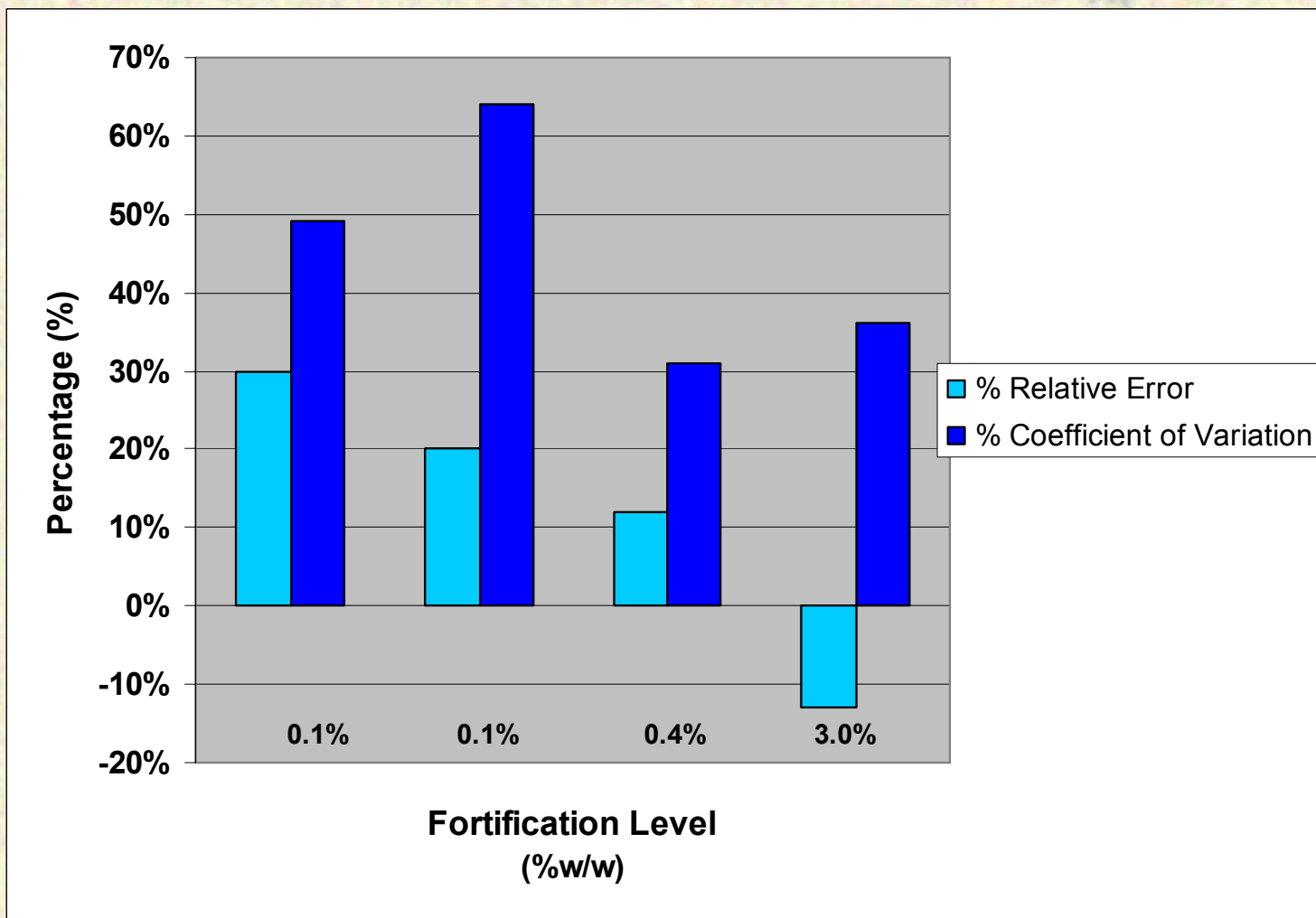
Z-Scores

Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6
0.0	0.1%	0.1%	3.0%	0.4%	0.0%	0.0	0.1%	0.1%	3.0%	0.4%	0.0%
0.0	0.1	0.1	2.4	0.4	0.0	0.00	0.00	0.00	-0.64	0.00	0.00
0.0	0.1	0.2	3.3	0.4	0.0	0.00	0.00	1.34	0.32	0.00	0.00
0.0	0.2	0.3	2.9	0.6	0.0	0.00	1.52	2.67	-0.11	1.44	0.00
0.0	0.1	0.2	3.5	0.6	0.0	0.00	0.00	1.34	0.53	1.44	0.00
0.0	0.1	0.1	1.5	0.5	0.0	0.00	0.00	0.00	-1.59	0.72	0.00
0.0	0.10	0.14	2.90	0.48	0.00	0.00	0.00	0.53	-0.11	0.58	0.00
0.0	0.0	0.0	2.2	0.4	0.0	0.00	-1.52	-1.34	-0.85	0.00	0.00
0.0	0.13	0.13	3.9	0.61	0.00	0.00	0.46	0.40	0.96	1.51	0.00
0.0	0.2	0.1	2.0	0.3	0.0	0.00	1.52	0.00	-1.06	-0.72	0.00
0.0	0.1	0.1	2.7	0.4	0.0	0.00	0.00	0.00	-0.32	0.00	0.00
	0.13	0.10	3.00	0.60		0.00	0.46	0.00	0.00	1.44	0.00
0.0	0.22	0.16	3.00	0.60	0.00	0.00	1.83	0.80	0.00	1.44	0.00
0.0	0.3	0.2	2.0	0.4	0.0	0.00	3.05	1.34	-1.06	0.00	0.00
0.4	0.2	0.0	0.4	0.4	0.4	4.24	1.52	-1.34	-2.76	0.00	4.12
0.0	0.1	0.0	2.0	0.6	0.0	0.00	0.00	-1.34	-1.06	1.44	0.00
0.0	0.10	0.10	1.80	0.15	0.00	0.00	0.00	0.00	-1.27	-1.80	0.00
0.0	0.09	0.08	2.29	0.24	0.00	0.00	-0.15	-0.27	-0.75	-1.15	0.00
0.0	0.1	0.1	2.9	0.3		0.00	0.61	0.13	-0.06	-0.86	0.00

Statistical Analysis Bt-11

n	18	19	19	19	19	17
Actual	0.0	0.1	0.1	3.0	0.4	0.0
Mean	0.02	0.13	0.12	2.60	0.45	0.02
STD	0.09	0.07	0.07	0.94	0.14	0.10
CV	4.24	0.49	0.64	0.36	0.31	4.12
RSD	424%	49%	64%	36%	31%	412%
% Relative Error	NA	35%	17%	-13%	12%	NA
Range						
Min	0.00	0.00	0.00	0.40	0.15	0.00
Max	0.40	0.30	0.30	4.67	0.61	0.40

Graph Bt11



Data Analysis Mon863

Individual Reported Values

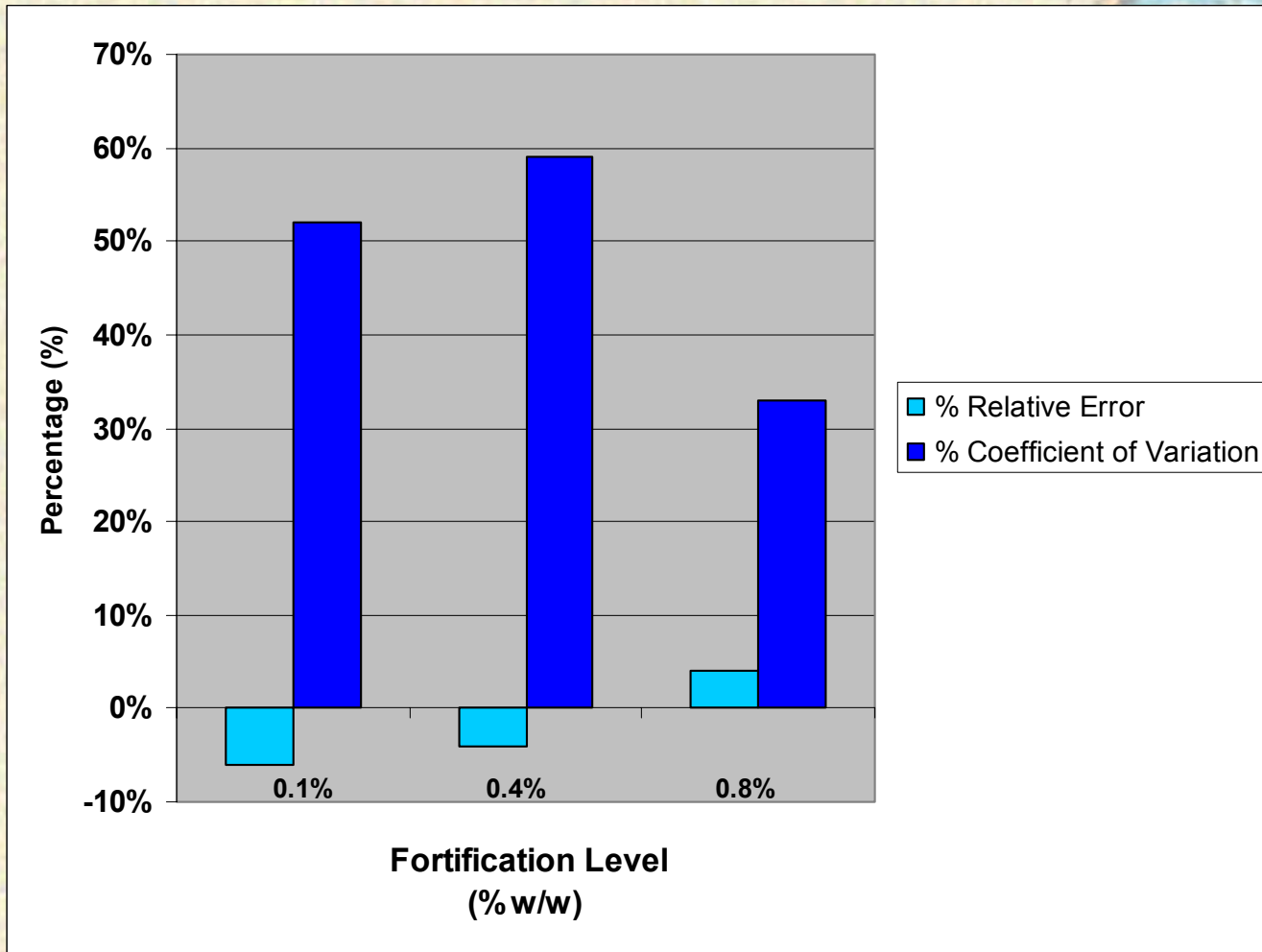
Z-Scores

Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 2	Sample 3	Sample 5
0.0%	0.1%	0.4%	0.0%	0.8%	0.0%	0.1%	0.4%	0.8%
0.0	0.1	0.4	0.0	0.7	0.0	0.00	0.00	-0.36
0.0	0.2	0.7	0.0	1.1	0.0	2.04	1.32	1.08
0.0	0.12	0.80	0.00	1.12	0.00	0.41	1.76	1.16
0.0	0.1	0.3	0.0	1.0	0.0	0.00	-0.44	0.72
0.0	0.1	0.4	0.0	1.0	0.0	0.00	0.00	0.72
	0.00	0.24	0.00	0.50		-2.04	-0.71	-1.08
0.0	0.1	0.4	0.0	0.8	0.0	0.00	0.00	0.00
0.0	0.1	0.0	0.0	1.2	0.0	0.00	-1.76	1.44
0.0	0.06	0.35	0.00	0.51	0.00	-0.82	-0.22	-1.05
0.0	0.05	0.27	0.00	0.40	0.00	-1.02	-0.57	-1.44
0.0	0.10		0.0	0.8	0.00	0.00		0.00

Statistical Analysis Mon863

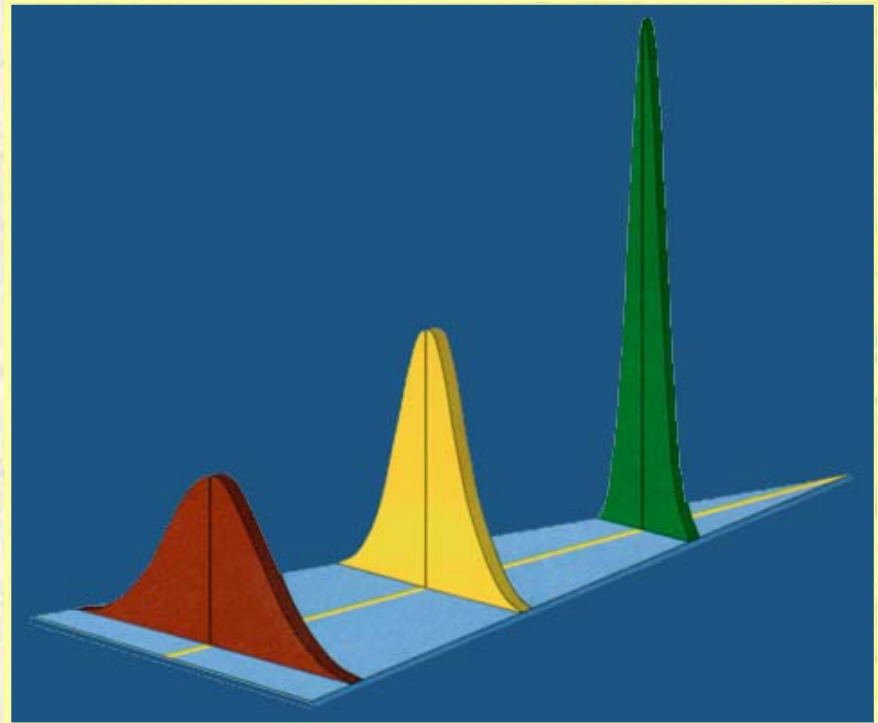
n	10	11	10	11	11	10
Actual	0	0.1	0.4	0	0.8	0
Mean	0	0.09	0.39	0	0.83	0
STD	0	0.05	0.23	0	0.28	0
CV	NA	0.52	0.59	NA	0.33	NA
RSD	NA	52%	59%	NA	33%	NA
% Relative Error	NA	-6%	-4%	NA	4%	NA
Range						
Min	0	0	0	0	0.4	0
Max	0	0.2	0.8	0	1.2	0

Graph Mon863



USDA's Role

USDA can facilitate the marketing of Biotech and non-Biotech grains by improving and standardizing the detection methods for Biotech grains.



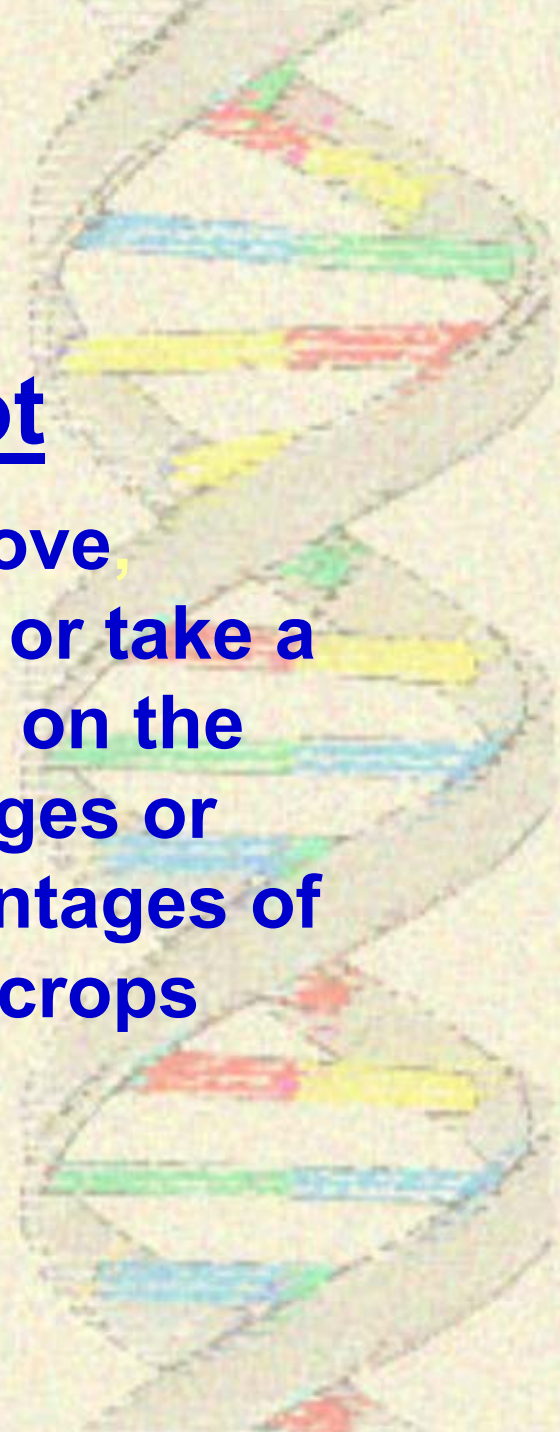
GIPSA's Role

Is

- To facilitate the fair and orderly marketing of grain, whether biotech, traditional, or value-enhanced

Is Not

- To approve, release, or take a position on the advantages or disadvantages of biotech crops



www.usda.gov/gipsa/biotech/biotech.htm





Vielen Dank !

