Mycotoxins:

Homogeneity and Stability

Trilogy Provides:
Homogeneity Data Before Round

Homogeneity Data		
Analyte Name	Aflatoxin B1 (ppb)	
Sample #	Rep. 1	Rep. 2
1	42.1	51.9
2	47.2	55.1
3	54.8	58.3
4	46.6	53.0
5	45.6	50.9
6	58.9	53.9
7	49.7	55.3
8	48.0	40.4
9	53.9	56.3
10	49.1	51.6

Mean = 51.13 ppb

%RSD Between Samples = 5.4 % (A) with Analytical variance removed.

%rsd Analytical = 6.9 %

***ffp* $\sigma_{PT,}$ Horwitz %RSD = 22 %**

Allowed %RSD = 7.3 % (B)

When we apply 95% confidence intervals, the variance due to sampling is less than the allowed variance (A < B).
PASS is recorded.

Homogeneity Test: Rabbit Feed 201763

ISO 13528:2015 (E) Criteria

Simply Put: $S^2_{Between\ Samples} \leq \left(0.3 \times \sigma_{Proficiency\ Testing}\right)^2$

Where: $S^2_{Between\ Samples} =$ Between Sample Variance

$\sigma_{Proficiency\ Testing}$ Derived from Modified Horwitz

Mycotoxin Homogeneity: Rabbit Feed 201763

	Units	Homogeneity Data Means (10 dups.)	Stability Data Means (5 dups.)	1st Decision	2nd Decision	Within Lab Analitical sd (15 dups.)
Aflatoxin B1	ppb	51.13	46.73	Pass	Pass	6.9%
Aflatoxin B2	ppb	4.56	3.23	High AV	Pass	9.9%
DON	ppm	3.15	3.04	Pass	High AV	7.1%
Fumonisin B1	ppm	0.91	0.86	High AV	Pass	7.4%
Fumonisin B2	ppm	0.13	0.17	High AV	Pass	13.2%
Fumonisin B3	ppm	0.13	0.12	High AV	Pass	21.7%
Ochratoxin	ppb	12.27	10.66	Pass	Pass	7.2%
T-2 Toxin	ppb	263.20	252.50	Pass	Pass	4.2%
HT-2 Toxin	ppb	92.71	97.26	Pass	Pass	4.1%
Zearalenone	ppb	542.21	543.87	Pass	Pass	6.4%

Trilogy Provides:
Stability Data at End of Round

Homogeneity Data

Analyte Name	Aflatoxin B1	
Sample #	Rep. 1	Rep. 2
1	42.1	51.9
2	47.2	55.1
3	54.8	58.3
4	46.6	53.0
5	45.6	50.9
6	58.9	53.9
7	49.7	55.3
8	48.0	40.4
9	53.9	56.3
10	49.1	51.6

Mean Before = 51.13

Stability Data

Analyte Name	Aflatoxin B1	
Sample #	Rep. 1	Rep. 2
1	45.5	45.7
2	48.8	48.6
3	46.9	46.5
4	48.4	45.1
5	46.2	45.6

Mean After = 46.73

Is this sufficient stability?

Mycotoxin Stability: Rabbit Feed 201763

Stability Test: from 08/09/2017 to 10/16/2017

ISO 13528:2015 (E) Criteria

$$\left| \overline{X}_{Before} - \overline{X}_{After} \right| \leq 0.3 \times \sigma_{Proficiency\ Testing}$$

$\sigma_{Proficiency\ Testing}$ Derived from Modified Horwitz

All this requires that the Analytical variance is LOW enough.

$$Analytical\ sd < 0.5 \times \sigma_{Proficiency\ Testing}$$

Mycotoxin Stability: Rabbit Feed 201763

Stability Test: from 08/09/2017 to 10/16/2017

	Units	Mean Before	Mean After	% Difference	Difference less than Allowed?	Analytical sd Low Enough?
Aflatoxin B1	ppb	51.13	46.73	-8.6%	Caution	Yes
Aflatoxin B2	ppb	4.56	3.23	-29.2%	Fail	Yes
DON	ppm	3.15	3.04	-3.6%	Pass	Yes
Fumonisin B1	ppm	0.91	0.86	-5.4%	Caution	Yes
Fumonisin B2	ppm	0.13	0.17	28.2%	Fail	No
Fumonisin B3	ppm	0.13	0.12	-5.1%	Pass	No
Ochratoxin	ppb	12.27	10.66	-13.2%	Fail	Yes
T-2 Toxin	ppb	263.20	252.50	-4.1%	Pass	Yes
HT-2 Toxin	ppb	92.71	97.26	4.9%	Pass	Yes
Zearalenone	ppb	542.21	543.87	0.3%	Pass	Yes

Comments:

- Trilogy provides Homogeneity and Stability data with each sample. We continue to evaluate.

- This is our first look at this input.

- The high Analytical Variance tends to confound the analysis.

- We do seem to have Acceptable Homogeneity.

- As we get a better handle on the true analytical variance we should be able to better identify stability issues.

- Perhaps we should look into more appropriate storage conditions. Relay these conditions to clients to implement immediately on receiving the sample.

- A new kind of stability test.

- For Now, let's wait and see how the next couple of samples pan out.