Proficiency Testing Program

ANALYTE
Summary Statistics

202624 (Equine Feed)

Issue Date: 5/31/2026

Code	Analyte	[1] Trueness (Lab Value)					[2] Thompson Horwitz %RSD	[3] Precision (range)	
		Robust Mean	n used	Robust Uncert.	Robust StDev	Robust %RSD		Robust Mean	n used
001	Loss on Drying (%)	9.547	47	0.0608	0.3332	3.49	2.85	0.1237	43
002	Protein, Crude (%)	13.7	127	0.0359	0.3237	2.36	2.7	0.1713	113
003	Fat, Crude (%)	4.992	112	0.0316	0.2677	5.36	3.14	0.1182	104
004	Fiber, Crude (%)	18	90	0.0935	0.7094	3.94	2.36	0.2554	83
005	Ash (%)	7.997	108	0.032	0.2663	3.33	2.93	0.1029	97
006	Total Sugars (%)	5.264	9	0.4178	1.003	19	3.12	0.4925	8
008	Fiber, Acid Detergent (%)	22.74	49	0.2099	1.175	5.17	2.1	0.3951	44
009	Fiber, Neutral Detergent (%)	35.99	44	0.2532	1.344	3.73	1.67	0.325	39
010	Moisture (%)	9.697	22	0.1332	0.4999	5.16	2.84	0.1171	20
011	Loss on Drying (%)	10.45	58	0.0578	0.3519	3.37	2.81	0.1298	54
012	Starch (%)	13.66	32	0.4047	1.832	13.4	2.7	0.2834	27
013	Fat, Pretreat (%)	6.1	45	0.1219	0.654	10.7	3.05	0.1869	43
014	Fiber, Total Dietary (%)	42.1	1					0.4	1

Code	Analyte	[1] Trueness (Lab Value) Robust Mean	n used	Robust Uncert.	Robust StDev	Robust %RSD	[2] Thompson Horwitz %RSD	[3] Precision (range) Robust Mean	n used
015	Aluminum (ppm)	**239.6**	**14**	**8.711**	**26.07**	**10.9**	**7.01**	**5.536**	**14**
017	Boron (ppm)	**16.29**	**17**	**0.4215**	**1.39**	**8.53**	**10.5**	**0.6747**	**14**
019	Calcium (%)	**1.016**	**110**	**0.0069**	**0.0577**	**5.68**	**3.99**	**0.0289**	**96**
021	Cobalt (ppm)	**3.985**	**29**	**0.2338**	**1.007**	**25.3**	**13**	**0.2156**	**26**
022	Copper (ppm)	**62.78**	**83**	**0.6351**	**4.629**	**7.37**	**8.58**	**2.627**	**77**
024	Iodine (ppm)	5.46	1					1.06	1
025	Iron (ppm)	**396.9**	**80**	**5.605**	**40.1**	**10.1**	**6.5**	**11.37**	**76**
027	Magnesium (%)	**0.3229**	**88**	**0.0023**	**0.0175**	**5.43**	**4.74**	**0.0084**	**71**
028	Manganese (ppm)	**363.3**	**82**	**2.619**	**18.97**	**5.22**	**6.59**	**12.89**	**80**
030	Nitrate (%)	0.0006	1					0.0003	1
031	Phosphorus (%)	**0.4844**	**102**	**0.0035**	**0.0282**	**5.82**	**4.46**	**0.0112**	**89**
032	Potassium (%)	**1.552**	**89**	**0.0096**	**0.0727**	**4.69**	**3.74**	**0.0347**	**74**
033	Salt as chloride (%)	**0.8136**	**38**	**0.0104**	**0.0512**	**6.29**	**4.13**	**0.0196**	**29**
033	Salt (%)	**0.8136**	**38**	**0.0104**	**0.0512**	**6.29**	**4.13**	**0.0196**	**29**
034	Selenium (ppm)	**0.503**	**19**	**0.0203**	**0.0706**	**14**	**17.7**	**0.0352**	**18**
035	Sodium (%)	**0.1803**	**86**	**0.0017**	**0.0123**	**6.85**	**5.18**	**0.0081**	**67**
036	Sulfur (%)	**0.2146**	**53**	**0.0029**	**0.017**	**7.93**	**5.04**	**0.0075**	**42**
037	Zinc (ppm)	**264.3**	**82**	**2.459**	**17.81**	**6.74**	**6.91**	**8.115**	**79**
038	Molybdenum (ppm)	**1.572**	**19**	**0.0644**	**0.2246**	**14.3**	**14.9**	**0.0951**	**18**

Code	Analyte	[1] Trueness (Lab Value)					[2] Thompson Horwitz %RSD	[3] Precision (range)	
		Robust Mean	n used	Robust Uncert.	Robust StDev	Robust %RSD		Robust Mean	n used
040	Barium (ppm)	32.12	3	2.03	2.812	8.76	**9.49**	0.1255	3
041	Vanadium (ppm)	0.8545	1					0.0064	1
042	Chloride (%)	**0.4976**	**14**	**0.0078**	**0.0235**	**4.71**	**4.44**	**0.0135**	**12**
101	Choline Chloride (ppm)	1325	1					30	1
102	Niacin (ppm)	93.87	2		44.73			6.0665	2
103	Pantothenic Acid (ppm)	44.05	1					0.9	1
104	Riboflavin (ppm)	**19.31**	**6**	**2.06**	**4.036**	**20.9**	**10.2**	**0.9529**	**6**
105	Thiamine (ppm)	24.82	5	3.875	6.931	27.9	**9.87**	2.081	5
106	Vitamin A (KU/kg)	**8.295**	**10**	**0.8445**	**2.137**	**25.8**		**1.225**	**10**
107	Vitamin B12 (ppb)	28.32	2		3.005			1.15	2
108	Vitamin D3 (KU/kg)	1.084	5	0.1805	0.3229	29.8		0.1112	5
109	Vitamin E (IU/kg)	**305.7**	**10**	**17.5**	**44.27**	**14.5**		**9.784**	**10**
111	Vitamin C, Phosphorylated (ppm)	248.5	2		94.75			24	2
112	Pyridoxine (ppm)	3.295	2		1.704			0.08	2
113	Folic Acid (ppm)	1.455	1					0.39	1
114	Biotin (ppm)	0.172	1					0.01	1
115	Non Protein N (NPN) (%)	0.9758	2		0.5788			0.0135	2
120	Alanine (%)	**0.6325**	**13**	**0.005**	**0.0145**	**2.29**	**4.29**	**0.0151**	**11**
121	Arginine (%)	**0.69**	**15**	**0.0094**	**0.029**	**4.21**	**4.23**	**0.0148**	**12**

Code	Analyte	[1] Trueness (Lab Value) Robust Mean	n used	Robust Uncert.	Robust StDev	Robust %RSD	[2] Thompson Horwitz %RSD	[3] Precision (range) Robust Mean	n used
122	Aspartic (%)	**1.286**	**15**	**0.0102**	**0.0317**	**2.46**	**3.85**	**0.0312**	**14**
124	Cysteine/Cystine (%)	**0.2161**	**14**	**0.0091**	**0.0273**	**12.7**	**5.04**	**0.0087**	**8**
125	Glutamic (%)	**1.932**	**15**	**0.0123**	**0.0381**	**1.97**	**3.62**	**0.0554**	**13**
126	Glycine (%)	**0.6753**	**15**	**0.0085**	**0.0263**	**3.89**	**4.24**	**0.0179**	**14**
127	Histidine (%)	**0.2886**	**15**	**0.0073**	**0.0226**	**7.82**	**4.82**	**0.0111**	**13**
128	Isoleucine (%)	**0.4642**	**15**	**0.0095**	**0.0294**	**6.33**	**4.49**	**0.0113**	**12**
129	Leucine (%)	**0.8615**	**15**	**0.0069**	**0.0213**	**2.47**	**4.09**	**0.0175**	**12**
130	L-Lysine (%)	**0.6359**	**16**	**0.0149**	**0.0478**	**7.52**	**4.28**	**0.0203**	**13**
131	Methionine (%)	**0.1788**	**16**	**0.0036**	**0.0116**	**6.47**	**5.18**	**0.0083**	**10**
132	Phenylalanine (%)	**0.5566**	**14**	**0.0098**	**0.0292**	**5.25**	**4.37**	**0.0163**	**11**
133	Proline (%)	**0.7657**	**14**	**0.0166**	**0.0497**	**6.49**	**4.16**	**0.0279**	**11**
134	Serine (%)	**0.6072**	**15**	**0.006**	**0.0186**	**3.07**	**4.31**	**0.0131**	**14**
135	Threonine (%)	**0.4745**	**17**	**0.0076**	**0.0252**	**5.3**	**4.47**	**0.0134**	**13**
136	Tryptophan (%)	**0.1771**	**12**	**0.0103**	**0.0285**	**16.1**	**5.19**	**0.0113**	**9**
137	Tyrosine (%)	**0.3803**	**14**	**0.012**	**0.036**	**9.46**	**4.63**	**0.0169**	**11**
138	Valine (%)	**0.6067**	**16**	**0.0178**	**0.0568**	**9.36**	**4.31**	**0.0141**	**13**
139	Taurine (%)	0.0705	2		0.0983			0.02	1
160	Fructose (%)	0.425	3	0.0501	0.0695	16.3	**4.55**	0.0433	3
161	Galactose (%)	0.015	1					0.01	1

Code	Analyte	[1] Trueness (Lab Value) Robust Mean	n used	Robust Uncert.	Robust StDev	Robust %RSD	[2] Thompson Horwitz %RSD	[3] Precision (range) Robust Mean	n used
162	Glucose (%)	0.2783	3	0.0571	0.0791	28.4	**4.85**		
164	Maltose (%)	0.24	2		0.0636			0.01	2
165	Sucrose (%)	3.215	3	0.0908	0.1258	3.91	**3.36**	0.1967	3
166	Raffinose (%)	0.2967	3	0.0137	0.0189	6.38	**4.8**		
167	Stachyose (%)	0.5367	3	0.1673	0.2319	43.2	**4.39**	0.0333	3
400	Water Activity (Units)	**0.5582**	**6**	**0.0046**	**0.0091**	**1.63**	**1.34**	**0.005**	**6**
516	Arsenic, Total (ppm)	**0.1493**	**6**	**0.0062**	**0.0122**	**8.18**	**21.3**	**0.0103**	**6**
518	Cadmium (ppm)	**0.1354**	**9**	**0.0074**	**0.0179**	**13.2**	**21.6**	**0.0107**	**8**
520	Chromium (ppm)	**8.486**	**18**	**1.175**	**3.989**	**47**	**11.6**	**0.4508**	**18**
526	Lead (ppm)	**0.814**	**7**	**0.0319**	**0.0675**	**8.29**	**16.5**	**0.0398**	**7**
529	Mercury (ppb)	300.7	2		423.3			190.1541	2
539	Nickel (ppm)	**5.212**	**9**	**0.9315**	**2.236**	**42.9**	**12.5**	**0.3741**	**9**
710	Lauric Acid (12:0) (% w/w)	0.003	1						
714	Myristic Acid (14:0) (% w/w)	0.015	3	0.0016	0.0022	14.4	**7.52**	0.0008	3
716	Palmitic Acid (16:0) (% w/w)	0.9058	3	0.0656	0.0908	10	**4.06**	0.0316	3
718	Palmitoleic Acid (9c-16:1) (% w/w)	0.0127	2		0.0053			0.0019	1
720	Margaric acid (17:0) (% w/w)	0.0085	1					0.001	1
722	Stearic Acid (18:0) (% w/w)	0.1985	3	0.021	0.0291	14.7	**5.1**	0.0083	3
724	Oleic Acid (9c-18:1) (% w/w)	1.111	3	0.0705	0.0978	8.8	**3.94**	0.0245	3

Code	Analyte	[1] Trueness (Lab Value) Robust Mean	n used	Robust Uncert.	Robust StDev	Robust %RSD	[2] Thompson Horwitz %RSD	[3] Precision (range) Robust Mean	n used
726	Linoleic Acid (9c,12c-18:2) (% w/w)	2.246	3	0.1077	0.1493	6.65	**3.54**	0.063	3
728	alpha-Linolenic Acid (9c,12c,15c-18:3) (% w/w)	0.3664	3	0.0196	0.0272	7.42	**4.65**	0.0086	3
730	Arachidic Acid (20:0) (% w/w)	0.0207	2		0.0017			0.00085	2
732	Gondoic Acid (11c-20:1) (% w/w)	0.0128	2		0.0011			0.0004	1
742	Behenic Acid (22:0) (% w/w)	0.0217	2		0.0024			0.0025	1
744	Erucic Acid (13c-22:1) (% w/w)	0.002	1						
748	Lignoceric Acid (24:0) (% w/w)	0.0211	2		0.0065			0.0026	2
752	Nervonic Acid (24:1) isomers (% w/w)	0.004	1					0.004	1
754	Total n-3 Polyunsaturated (Omega-3) Fatty Acids (% w/w)	0.3475	1					0.013	1
756	Total n-6 Polyunsaturated (Omega-6) Fatty Acids (% w/w)	2.156	1					0.073	1
758	Total Saturated Fatty Acids (% w/w)	1.187	2		0.1082			0.043	2
762	Total Monounsaturated Fatty Acids (% w/w)	1.222	1					0.0013	1
764	Total cis Monounsaturated Fatty Acids (% w/w)	1.146	1					0.054	1
766	Total Polyunsaturated Fatty Acids (% w/w)	2.945	1					0.028	1
768	Total cis Polyunsaturated Fatty Acids (% w/w)	2.508	1					0.085	1
770	Total Fat (equivalent to NLEA) (% w/w)	5.002	1					0.21	1
772	Total Fatty Acids (% w/w)	4.991	3	0.2744	0.3802	7.62	**3.14**		

1. Trueness Parameters: Statistical parameters defining the distribution of lab values which are used to evaluate how close a Lab Value is to the mean. Parameters shown for number of observations used (n used) > 2. Analyte All Labs PT report identifies data not used. Robust statistics was employed to determine mean and standard deviation (StDev) if number of observations used (n used) >=6 (blue background). Classical statistics was employed if number of observations used (n used) = 3, 4, or 5 (no color background). %RSD is the relative standard deviation with respect to the mean (StDev/Mean x 100). Uncertainty (Uncert.) is a measure of where the true population mean lies.

2. Thompson-Horwitz %RSD: Expected relative standard deviation based on analysis of data by Thompson and Horwitz (Thompson, DOI: 10.1039/b000282h).

3. Precision Parameters: Lab's precision is estimated by the difference in 2 results reported by a lab (range). Mean of ranges is shown for number of observations used (n used) > 2. Analyte All Tests report identifies data not used. Robust statistics was employed to determine mean if number of observations used (n used) >=6 (green background). Classical statistics was employed if number of observations used (n used) = 3, 4, or 5 (no color background).

Appendix

Content Description of ANALYTE Summary Statistics Report

The Analyte Summary Statistics Report provides trueness and precision parameters from determination of an analyte regardless of method. Determination of summary statistics followed protocols in ISO 13528:2015(E) using Algorithm A robust analysis (Statistical methods for use in proficiency testing by interlaboratory comparison). Robust statistics was used to determine statistical parameters for sets with 6 or more observations. Classical statistics was used for sets with 3, 4, or 5 observations. Robust statistics has an advantage of removing undesired influence of outlying data on the mean and standard deviation without removing data from the statistical analysis.

For trueness, the mean and standard deviation are presented for the number of observations (n used). The uncertainty (Uncert.) is a measure of where the "real" value for the concentration lies around the mean with a 68% certainty (Mean ± Uncert.). As the number of observations (n used) increases, uncertainty decreases. The relative standard deviation (%RSD) is a percentage of the standard deviation divided by the mean (standard deviation / mean x 100). The Thompson-Horwitz %RSD is a standard benchmark on variability based on data analyzed by Thompson and Horwitz (Thompson, DOI: 10.1039/b000282h).

Precision in the data populations is estimated by the range of duplicate results reported. The robust or classical mean is presented along with the number of observations. Any duplicate results that are exactly the same are removed in the determination of the mean to remove undo influence of entries that may be from labs reporting one result twice.