AAFCO
Association of American Feed Control Officials

ANAB ACCREDITED ISO/IEC 17043 PROFICIENCY TESTING PROVIDER

AAFCO PTP Animal Feed Scheme

Animal Feed Scheme

 # Labs Reporting: 166

Cottonseed Meal

Method Summary Report

 # Methods Reported: 384

Test Material Code # 202328

(Precision Report Follows)

Issue Date : 09/30/2023

Method Code	Analyte and Method	Total # Labs Submitting	# Labs in Robust Calcs	Raw Mean	Raw SD	Assigned Value Robust Mean	AAFCO ffp Robust SD	Uncertainty (U) - Robust	% RSD - Robust	Average Range (Rob R-bar)	Thompson Horwitz %RSD
000.02	Urea, As protein, Colorimetric (%)	1	1	0.2000							
001.07	Loss on Drying, 104°C 3 hr, in malt (%)	48	**46**	8.674	0.6488	**8.767**	0.3428	0.0632	3.91%	0.1058	2.88%
001.99	Loss on Drying, Miscellaneous (%)	23	**22**	8.611	0.8569	**8.687**	0.7875	0.2099	9.06%	0.1055	2.89%
001.00	Loss on Drying, Vac 95°C 5 hr (%)	4	4	8.926	0.2373	8.926	0.2373	0.1187	2.66%	0.0463	2.88%
001.03	Loss on Drying, Low temp. methods (%)	2	2	9.210	0.1768						
001.05	Loss on Drying, LECO (%)	1	1	8.919							
002.06	Protein, Crude, Combustion Nitrogen Analyzer (%)	110	**108**	40.97	0.7089	**41.01**	0.6353	0.0764	1.55%	0.4848	1.56%
002.05	Protein, Crude, Copper, Boric Acid (%)	22	**20**	40.25	0.6178	**40.25**	0.6726	0.1880	1.67%	0.2185	1.58%
002.01	Protein, Crude, Auto Kjel-Foss (%)	19	**19**	40.53	0.5203	**40.52**	0.4566	0.1309	1.13%	0.2647	1.57%
002.00	Protein, Crude, Crude (%)	3	3	40.23	0.6303	40.23	0.6303	0.3639	1.57%	0.4033	1.58%
002.11	Protein, Crude, NIR (%)	3	3	39.06	2.402	39.06	2.402	1.387	6.15%	0.8667	1.60%
002.08	Protein, Crude, Cu/Ti (%)	2	2	40.30	0.3299						
002.02	Protein, Crude, Semiauto Autoanalyzer (%)	1	1	40.20							
002.04	Protein, Crude, Copper Catalyst (%)	1	1	40.01							
002.10	Protein, Crude, Block dig/distillation (%)	1	1	40.53							
002.99	Protein, Crude, Miscellaneous (%)	1	1	36.67							
003.14	Fat, Crude, Ankom (%)	58	**56**	3.365	0.3827	**3.360**	0.3441	0.0575	10.24%	0.1496	3.33%
003.10	Fat, Crude, Randall, Pet Ether (%)	31	**30**	3.227	0.2308	**3.216**	0.2315	0.0528	7.20%	0.0902	3.35%
003.06	Fat, Crude, Pet Ether (%)	14	**13**	3.388	0.3517	**3.376**	0.3712	0.1287	11.00%	0.1028	3.33%
003.09	Fat, Crude, Randall, Diethyl Ether Ext (%)	9	**9**	3.548	0.1227	**3.548**	0.1391	0.0580	3.92%	0.1471	3.31%
003.00	Fat, Crude, Diethyl Ether Ext., Direct (%)	9	**8**	3.703	0.3929	**3.703**	0.4456	0.1969	12.03%	0.0392	3.28%
003.13	Fat, Crude, Randall, Hexane Ext. (%)	6	**6**	3.432	0.5614	**3.446**	0.6026	0.3075	17.49%	0.0583	3.32%
003.12	Fat, Crude, Hexane Ext (%)	5	4	3.820	0.3771	3.820	0.3771	0.1886	9.87%	0.1100	3.27%
003.99	Fat, Crude, Miscellaneous (%)	4	4	2.803	1.187	2.803	1.187	0.5933	42.34%	0.0900	3.43%
003.01	Fat, Crude, Diethyl Ether Ext (13th ed.), Indirect (%)	3	3	3.711	0.4096	3.711	0.4096	0.2365	11.04%	0.0496	3.28%
003.11	Fat, Crude, NIR (%)	3	3	4.208	0.1235	4.208	0.1235	0.0713	2.94%	0.0900	3.22%
004.07	Fiber, Crude, ANKOM (%)	74	**71**	12.48	1.522	**12.32**	1.173	0.1740	9.52%	0.3062	2.74%
004.06	Fiber, Crude, Fibertec (%)	17	**16**	11.87	1.056	**11.87**	0.9550	0.2984	8.04%	0.2302	2.76%
004.00	Fiber, Crude, Asbestos Free (%)	12	**12**	12.80	1.082	**12.80**	1.227	0.4426	9.58%	0.5445	2.73%

Test Material Code # 202328 **(Precision Report Follows)** **Issue Date : 09/30/2023**

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004.03	Fiber, Crude, Fritted Glass (%)	2	2	9.690	1.839						
004.11	Fiber, Crude, NIR (%)	2	2	13.03	3.970						
004.99	Fiber, Crude, Miscellaneous (%)	2	2	12.56	1.004						
005.00	Ash, 2h @ 600°C (%)	95	**93**	7.866	0.1703	**7.870**	0.1415	0.0183	1.80%	0.0655	2.93%
005.05	Ash, 3h @ 550°C (%)	26	**25**	7.975	0.1724	**7.954**	0.1028	0.0257	1.29%	0.0626	2.93%
005.99	Ash, Miscellaneous (%)	10	**9**	7.991	0.1648	**7.991**	0.1868	0.0778	2.34%	0.0514	2.93%
005.02	Ash, LECO (%)	1	1	7.796							
005.03	Ash, Microwave furnace (%)	1	1	7.550							
005.11	Ash, NIR (%)	1	1	10.27							
006.99	Total Sugars, Miscellaneous (%)	5	4	4.093	2.250	4.093	2.250	1.125	54.99%	0.0467	3.24%
006.00	Total Sugars, As sucrose (%)	2	2	5.073	0.0389						
006.01	Total Sugars, Mod. Fehling Soln (%)	1	1	5.955							
006.03	Total Sugars, Invert w/o Invrsn (%)	1	1	3.875							
008.08	Fiber, Acid Detergent, Filter Bag - ANKOM (%)	49	**47**	18.34	1.906	**18.31**	1.865	0.3400	10.19%	0.4599	2.34%
008.02	Fiber, Acid Detergent, Crucible (%)	10	**10**	17.10	0.5244	**17.15**	0.4698	0.1857	2.74%	0.4711	2.41%
008.99	Fiber, Acid Detergent, Miscellaneous (%)	3	3	17.30	0.0993	17.30	0.0993	0.0573	0.57%	0.3330	2.40%
009.09	Fiber, Neutral Detergent, Filter Bag - ANKOM (%)	45	**44**	26.75	3.508	**26.41**	2.964	0.5585	11.22%	0.5995	1.95%
009.07	Fiber, Neutral Detergent, AOAC -ENZ Pretreat (%)	10	**10**	24.55	2.382	**24.52**	2.640	1.044	10.77%	0.8356	2.02%
009.99	Fiber, Neutral Detergent, Miscellaneous (%)	3	3	27.92	6.651	27.92	6.651	3.840	23.82%	1.130	1.89%
010.99	Moisture, Miscellaneous (%)	14	**14**	8.679	0.7508	**8.731**	0.5784	0.1932	6.62%	0.1175	2.89%
010.03	Moisture, Karl-Fischer (%)	2	2	9.103	0.6470						
010.11	Moisture, NIR (%)	2	2	7.683	2.139						
011.01	Loss on Drying, HT, 135°C 2hr (%)	64	**63**	9.581	0.6414	**9.682**	0.4333	0.0682	4.48%	0.1211	2.84%
011.02	Loss on Drying, HT, 130°C for 2 hours (%)	3	3	10.44	1.142	10.44	1.142	0.8077	10.94%	1.245	2.81%
011.99	Loss on Drying, HT, High Temp. Methods Miscellaneous (%)	3	3	10.21	0.5931	10.21	0.5931	0.3424	5.81%	0.2040	2.82%
012.00	Starch, Polarimetric (Ewers) (%)	9	**9**	2.553	1.352	**2.553**	1.533	0.6388	60.06%	0.2056	3.47%
012.01	Starch, Enzymatic-Colorimetric Method (Megazyme) (%)	10	**8**	0.6518	0.6385	**0.4773**	0.2144	0.0948	44.93%	0.1017	4.47%
012.04	Starch, Enzymatic-Enzyme Membrane Technology (YSI) (%)	8	**8**	2.489	3.295	**1.758**	1.712	0.7567	97.42%	0.1105	3.67%
012.03	Starch, Enzymatic-Colorimetric Method, Miscellaneous (%)	2	2	0.8972	0.5272						
012.11	Starch, NIR (%)	1	1	0.5650							
012.98	Starch, Dietary, Miscellaneous (%)	1	1	0.9325							
012.99	Starch, Miscellaneous (%)	1	1	1.700							
013.00	Fat, Pretreat, Acid hydrolysis (%)	16	**15**	4.833	0.7319	**4.831**	0.8267	0.2668	17.11%	0.1153	3.16%
013.02	Fat, Pretreat, Mojonnier, Bak Ext, Acid hydrolysis (%)	14	**13**	4.651	0.9814	**4.652**	1.110	0.3849	23.86%	0.1958	3.17%
013.13	Fat, Pretreat, Ankom- Acid Hydrolysis (%)	8	**8**	4.526	0.8288	**4.526**	0.9399	0.4154	20.77%	0.3511	3.19%
013.10	Fat, Pretreat, Soxtec-Acid Hydrolysis (%)	7	**7**	4.179	0.4892	**4.179**	0.5548	0.2621	13.27%	0.0912	3.23%
013.08	Fat, Pretreat, Roese-Gottlieb Modified, Alkaline Hydrolysis (%)	1	1	2.460							
015.43	Aluminum, ICP, Microwave (ppm)	6	**6**	468.5	92.45	**449.4**	56.60	28.88	12.59%	12.10	6.38%
015.41	Aluminum, ICP, Dry ash (ppm)	4	4	392.2	111.4	392.2	111.4	55.71	28.41%	9.374	6.51%
015.42	Aluminum, ICP, Open vessel (ppm)	3	2	210.4	153.4	210.4	153.4			6.350	7.15%

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015.53	Aluminum, ICP-MS, Microwave (ppm)	2	2	478.7	13.87						
015.99	Aluminum, Miscellaneous (ppm)	1	1	226.0							
017.41	Boron, ICP, Dry ash (ppm)	4	4	17.21	0.4710	17.21	0.4710	0.2355	2.74%	0.8758	10.42%
017.42	Boron, ICP, Open vessel (ppm)	5	4	16.56	1.144	16.56	1.144	0.5720	6.91%	0.7940	10.48%
017.43	Boron, ICP, Microwave (ppm)	6	4	17.52	1.215	17.52	1.215	0.7592	6.94%	0.2444	10.40%
017.53	Boron, ICP-MS, Microwave (ppm)	1	1	20.51							
017.99	Boron, Miscellaneous (ppm)	1	1	18.60							
019.43	Calcium, ICP, Microwave (%)	32	**31**	0.2501	0.0216	**0.2480**	0.0184	0.0041	7.41%	0.0116	4.93%
019.41	Calcium, ICP, Dry ash (%)	22	**21**	0.2612	0.0307	**0.2567**	0.0226	0.0062	8.82%	0.0107	4.91%
019.31	Calcium, AAS, Dry ash (%)	20	**19**	0.2482	0.0413	**0.2504**	0.0303	0.0087	12.11%	0.0093	4.93%
019.42	Calcium, ICP, Open vessel (%)	20	**19**	0.2599	0.0244	**0.2579**	0.0233	0.0067	9.02%	0.0112	4.90%
019.08	Calcium, EDTA (%)	12	**12**	0.2950	0.0921	**0.2920**	0.0880	0.0318	30.15%	0.0100	4.81%
019.99	Calcium, Miscellaneous (%)	7	**7**	0.2479	0.0280	**0.2435**	0.0208	0.0098	8.54%	0.0100	4.95%
019.00	Calcium, Ox-Mn04 Vol. (%)	4	4	0.3288	0.0510	0.3288	0.0510	0.0255	15.52%	0.0283	4.73%
019.44	Calcium, ICP, Dry ash (%)	3	3	0.2471	0.0081	0.2471	0.0081	0.0047	3.28%	0.0059	4.94%
019.52	Calcium, ICP-MS, Open vessel (%)	3	3	0.2552	0.0264	0.2552	0.0264	0.0152	10.33%	0.0156	4.91%
019.53	Calcium, ICP-MS, Microwave (%)	3	3	0.2285	0.0313	0.2285	0.0313	0.0180	13.68%	0.0185	4.99%
019.02	Calcium, Hach Method (%)	1	1	0.3550							
019.09	Calcium, Ion-selective electrode (%)	1	1	0.3965							
019.32	Calcium, AAS, Open vessel (%)	1	1	0.2450							
021.43	Cobalt, ICP, Microwave (ppm)	10	**10**	8.182	2.163	**8.181**	2.452	0.9694	29.97%	0.4740	11.66%
021.42	Cobalt, ICP, Open vessel (ppm)	5	5	5.988	2.801	5.988	2.801	1.253	46.79%	1.310	12.22%
021.41	Cobalt, ICP, Dry ash (ppm)	5	4	8.680	0.6591	8.680	0.6591	0.3296	7.59%	0.0471	11.56%
021.53	Cobalt, ICP-MS, Microwave (ppm)	4	3	6.239	4.443	6.239	4.443	2.565	71.22%	0.1050	12.14%
021.31	Cobalt, AAS, Dry ash (ppm)	2	2	26.85	28.78						
021.52	Cobalt, ICP-MS, Open vessel (ppm)	2	2	1.603	0.0106						
021.99	Cobalt, Miscellaneous (ppm)	1	1	6.775							
022.43	Copper, ICP, Microwave (ppm)	30	**29**	11.31	1.119	**11.18**	0.8333	0.1934	7.45%	0.5543	11.12%
022.42	Copper, ICP, Open vessel (ppm)	21	**19**	11.42	1.107	**11.39**	0.9880	0.2833	8.67%	0.5295	11.09%
022.41	Copper, ICP, Dry ash (ppm)	16	**15**	12.39	1.707	**12.29**	1.687	0.5444	13.72%	1.186	10.97%
022.31	Copper, AAS, Dry ash (ppm)	9	**8**	12.08	1.646	**12.08**	1.866	0.8247	15.44%	0.3120	10.99%
022.44	Copper, ICP, Dry ash (ppm)	3	3	11.17	0.7447	11.17	0.7447	0.4300	6.67%	0.2220	11.12%
022.53	Copper, ICP-MS, Microwave (ppm)	3	3	10.71	1.099	10.71	1.099	0.7770	10.26%	0.5112	11.20%
022.99	Copper, Miscellaneous (ppm)	4	3	10.88	0.8312	10.88	0.8312	0.4799	7.64%	0.3500	11.17%
022.52	Copper, ICP-MS, Open vessel (ppm)	2	2	11.95	0.1874						
022.32	Copper, AAS, Open vessel (ppm)	1	1	11.00							
022.33	Copper, AAS, Microwave (ppm)	1	1	13.72							
024.52	Iodine, ICP-MS, Open vessel (ppm)	1	1	0.2135							
025.43	Iron, ICP, Microwave (ppm)	28	**27**	385.3	56.28	**388.9**	52.23	12.56	13.43%	14.39	6.52%
025.41	Iron, ICP, Dry ash (ppm)	19	**19**	386.1	35.74	**388.1**	29.94	8.587	7.72%	17.93	6.52%

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025.42	Iron, ICP, Open vessel (ppm)	19	**18**	302.6	94.96	**308.0**	93.92	27.67	30.49%	10.62	6.75%
025.31	Iron, AAS, Dry ash (ppm)	11	**11**	354.5	66.02	**359.0**	61.52	23.18	17.14%	7.142	6.60%
025.99	Iron, Miscellaneous (ppm)	4	4	340.0	29.94	340.0	29.94	14.97	8.81%	23.33	6.65%
025.53	Iron, ICP-MS, Microwave (ppm)	3	3	259.2	137.1	259.2	137.1	96.97	52.91%	24.46	6.93%
025.52	Iron, ICP-MS, Open vessel (ppm)	2	2	201.1	134.8						
025.33	Iron, AAS, Microwave (ppm)	1	1	399.8							
027.43	Magnesium, ICP, Microwave (%)	30	**28**	0.6164	0.0347	**0.6174**	0.0360	0.0085	5.83%	0.0147	4.30%
027.42	Magnesium, ICP, Open vessel (%)	21	**20**	0.6338	0.0290	**0.6323**	0.0275	0.0077	4.36%	0.0122	4.29%
027.41	Magnesium, ICP, Dry ash (%)	18	**18**	0.6348	0.0287	**0.6335**	0.0294	0.0087	4.64%	0.0160	4.28%
027.31	Magnesium, AAS, Dry ash (%)	8	**8**	0.6052	0.0331	**0.6052**	0.0375	0.0166	6.19%	0.0141	4.31%
027.99	Magnesium, Miscellaneous (%)	5	4	0.6200	0.0158	0.6200	0.0158	0.0079	2.55%	0.0150	4.30%
027.52	Magnesium, ICP-MS, Open vessel (%)	3	3	0.6151	0.0174	0.6151	0.0174	0.0123	2.82%	0.0253	4.30%
027.53	Magnesium, ICP-MS, Microwave (%)	3	3	0.5797	0.0908	0.5797	0.0908	0.0524	15.66%	0.0422	4.34%
027.44	Magnesium, ICP, Dry ash (%)	2	2	0.6535	0.0043						
027.32	Magnesium, AAS, Open vessel (%)	1	1	0.6000							
027.33	Magnesium, AAS, Microwave (%)	1	1	0.5820							
028.43	Manganese, ICP, Microwave (ppm)	28	**27**	39.96	3.050	**39.93**	2.798	0.6732	7.01%	1.397	9.18%
028.42	Manganese, ICP, Open vessel (ppm)	22	**21**	40.58	2.532	**40.54**	2.777	0.7574	6.85%	1.311	9.16%
028.41	Manganese, ICP, Dry ash (ppm)	16	**16**	40.04	3.005	**39.71**	2.430	0.7593	6.12%	1.325	9.19%
028.31	Manganese, AAS, Dry ash (ppm)	10	**10**	34.14	8.263	**34.14**	9.371	3.704	27.45%	0.7891	9.40%
028.99	Manganese, Miscellaneous (ppm)	4	4	40.04	1.404	40.04	1.404	0.7022	3.51%	3.433	9.18%
028.44	Manganese, ICP, Dry ash (ppm)	3	3	37.64	3.875	37.64	3.875	2.237	10.30%	1.300	9.27%
028.53	Manganese, ICP-MS, Microwave (ppm)	3	3	36.86	2.677	36.86	2.677	1.893	7.26%	1.656	9.30%
028.52	Manganese, ICP-MS, Open vessel (ppm)	2	2	40.39	1.400						
028.00	Manganese, Color (ppm)	1	1	43.00							
028.32	Manganese, AAS, Open vessel (ppm)	1	1	46.05							
028.33	Manganese, AAS, Microwave (ppm)	1	1	33.88							
030.01	Nitrate, Ion-selective electrode (%)	1	1	0.0024							
031.01	Phosphorus, Photometric (%)	36	**33**	1.148	0.0505	**1.155**	0.0390	0.0085	3.38%	0.0147	3.91%
031.43	Phosphorus, ICP, Microwave (%)	34	**32**	1.169	0.0747	**1.166**	0.0563	0.0124	4.83%	0.0435	3.91%
031.41	Phosphorus, ICP, Dry ash (%)	21	**21**	1.184	0.0695	**1.178**	0.0583	0.0159	4.95%	0.0285	3.90%
031.42	Phosphorus, ICP, Open vessel (%)	21	**21**	1.185	0.0854	**1.182**	0.0887	0.0242	7.50%	0.0446	3.90%
031.99	Phosphorus, Miscellaneous (%)	6	**6**	1.119	0.0867	**1.119**	0.0984	0.0502	8.79%	0.0420	3.93%
031.44	Phosphorus, ICP, Dry ash (%)	4	4	1.162	0.0848	1.162	0.0848	0.0424	7.30%	0.0234	3.91%
031.53	Phosphorus, ICP-MS, Microwave (%)	3	3	1.118	0.1709	1.118	0.1709	0.0987	15.28%	0.0716	3.93%
031.03	Phosphorus, Autoanalyzer (%)	2	2	1.156	0.0431						
031.52	Phosphorus, ICP-MS, Open vessel (%)	2	2	1.188	0.0306						
031.06	Phosphorus, Hach Method (%)	1	1	1.315							
032.43	Potassium, ICP, Microwave (%)	33	**32**	1.644	0.0687	**1.643**	0.0756	0.0167	4.60%	0.0360	3.71%
032.41	Potassium, ICP, Dry ash (%)	19	**19**	1.687	0.1356	**1.668**	0.0751	0.0215	4.50%	0.0558	3.70%

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032.42	Potassium, ICP, Open vessel (%)	20	**19**	1.680	0.1226	**1.674**	0.1110	0.0318	6.63%	0.0360	3.70%
032.31	Potassium, AAS, Dry ash (%)	8	**8**	1.613	0.0869	**1.614**	0.0954	0.0422	5.91%	0.0394	3.72%
032.99	Potassium, Miscellaneous (%)	6	**6**	1.649	0.1023	**1.649**	0.1160	0.0592	7.03%	0.0286	3.71%
032.52	Potassium, ICP-MS, Open vessel (%)	3	3	1.621	0.0939	1.621	0.0939	0.0542	5.79%	0.0322	3.72%
032.53	Potassium, ICP-MS, Microwave (%)	3	3	1.565	0.1876	1.565	0.1876	0.1083	11.98%	0.0494	3.74%
032.44	Potassium, ICP, Dry ash (%)	2	2	1.715	0.1624						
032.02	Potassium, Flame Emission (%)	1	1	1.615							
032.08	Potassium, Ion-selective electrode (%)	1	1	0.7300							
032.32	Potassium, AAS, Open vessel (%)	1	1	1.615							
033.01	Salt as chloride, Poten Cl (%)	20	**19**	0.1124	0.0442	**0.1090**	0.0268	0.0077	24.60%	0.0100	5.58%
033.00	Salt as chloride, Sol Cl (%)	5	4	0.1175	0.0180	0.1175	0.0180	0.0090	15.30%	0.0170	5.52%
033.99	Salt, Miscellaneous (%)	4	4	0.2366	0.2215	0.2366	0.2215	0.1107	93.58%	0.0218	4.97%
033.03	Salt as chloride, Quantab (%)	3	3	0.2000	0.0606	0.2000	0.0606	0.0429	30.31%	0.0267	5.10%
033.05	Salt as chloride, Ion Sel Electrode (%)	3	3	0.1417	0.0775	0.1417	0.0775	0.0548	54.66%	0.0205	5.37%
034.53	Selenium, Total (Se), ICP-MS, Microwave (ppm)	7	**6**	0.1742	0.0413	**0.1742**	0.0468	0.0239	26.89%	0.0111	20.81%
034.04	Selenium, Total (Se), AA, Hydride (ppm)	3	3	0.1407	0.0533	0.1407	0.0533	0.0307	37.86%	0.0307	21.49%
034.43	Selenium, Total (Se), ICP, Microwave (ppm)	5	3	0.2830	0.2060	0.2830	0.2060	0.1189	72.80%	0.0121	19.34%
034.41	Selenium, Total (Se), ICP, Dry ash (ppm)	2	2	0.1705	0.0000						
034.52	Selenium, Total (Se), ICP-MS, Open vessel (ppm)	2	2	1.154	0.9955						
034.01	Selenium, Total (Se), Fluor (ppm)	1	1	0.1700							
034.99	Selenium, Total (Se), Miscellaneous (ppm)	1	1	0.6565							
034.42	Selenium, Total (Se), ICP, Open vessel (ppm)	2		1.000							
035.43	Sodium, ICP, Microwave (%)	28	**27**	0.2281	0.0272	**0.2245**	0.0141	0.0034	6.29%	0.0087	5.01%
035.41	Sodium, ICP, Dry ash (%)	21	**20**	0.2238	0.0166	**0.2237**	0.0077	0.0022	3.45%	0.0080	5.01%
035.42	Sodium, ICP, Open vessel (%)	18	**17**	0.2234	0.0141	**0.2214**	0.0106	0.0032	4.79%	0.0065	5.02%
035.31	Sodium, AAS, Dry ash (%)	9	**9**	0.1936	0.0497	**0.1973**	0.0481	0.0200	24.36%	0.0034	5.11%
035.53	Sodium, ICP-MS, Microwave (%)	3	3	0.2045	0.0251	0.2045	0.0251	0.0145	12.30%	0.0168	5.08%
035.99	Sodium, Miscellaneous (%)	5	3	0.2233	0.0058	0.2233	0.0058				5.01%
035.05	Sodium, Flame Emission (%)	2	2	2.524	3.212						
035.52	Sodium, ICP-MS, Open vessel (%)	2	2	0.2216	0.0168						
035.32	Sodium, AAS, Open vessel (%)	1	1	0.2100							
036.43	Sulfur, ICP, Microwave (%)	25	**23**	0.4496	0.0235	**0.4515**	0.0223	0.0058	4.93%	0.0113	4.51%
036.42	Sulfur, ICP, Open vessel (%)	19	**19**	0.4262	0.0225	**0.4264**	0.0251	0.0072	5.88%	0.0169	4.55%
036.04	Sulfur, LECO (%)	6	**6**	0.4383	0.0145	**0.4383**	0.0164	0.0084	3.74%	0.0234	4.53%
036.99	Sulfur, Miscellaneous (%)	2	2	0.3775	0.0035						
036.00	Sulfur, Gravimetric (%)	1	1	0.4350							
036.52	Sulfur, ICP-MS, Open vessel (%)	1	1	0.4370							
037.43	Zinc, ICP, Microwave (ppm)	32	**31**	74.59	8.051	**74.04**	6.546	1.470	8.84%	2.826	8.37%
037.42	Zinc, ICP, Open vessel (ppm)	21	**21**	74.27	6.460	**74.63**	6.436	1.756	8.62%	3.373	8.36%
037.41	Zinc, ICP, Dry ash (ppm)	17	**16**	77.69	7.241	**76.97**	6.368	1.990	8.27%	2.968	8.32%

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037.31	Zinc, AAS, Dry ash (ppm)	10	**10**	71.80	6.293	**72.54**	4.832	1.910	6.66%	2.101	8.39%
037.99	Zinc, Miscellaneous (ppm)	5	5	70.20	5.060	70.20	5.060	2.263	7.21%	5.710	8.44%
037.44	Zinc, ICP, Dry ash (ppm)	3	3	68.34	6.466	68.34	6.466	3.733	9.46%	1.189	8.47%
037.53	Zinc, ICP-MS, Microwave (ppm)	3	3	66.81	3.654	66.81	3.654	2.109	5.47%	2.943	8.50%
037.52	Zinc, ICP-MS, Open vessel (ppm)	2	2	91.92	15.52						
037.32	Zinc, AAS, Open vessel (ppm)	1	1	82.10							
037.33	Zinc, AAS, Microwave (ppm)	1	1	72.12							
037.34	Zinc, AAS, Dry ash (ppm)	1	1	75.49							
038.43	Molybdenum, ICP, Microwave (ppm)	8	**8**	1.011	0.3656	**1.015**	0.4056	0.1792	39.97%	0.1702	15.96%
038.42	Molybdenum, ICP, Open vessel (ppm)	6	4	1.154	0.1689	1.154	0.1689	0.1056	14.64%	0.1195	15.66%
038.41	Molybdenum, ICP, Dry ash (ppm)	3	3	1.041	0.0727	1.041	0.0727	0.0420	6.98%	0.0572	15.90%
038.53	Molybdenum, ICP-MS, Microwave (ppm)	3	3	0.7094	0.4011	0.7094	0.4011	0.2316	56.54%	0.1037	16.85%
038.52	Molybdenum, ICP-MS, Open vessel (ppm)	1	1	0.4133							
038.99	Molybdenum, Miscellaneous (ppm)	1	1	1.145							
040.53	Barium, ICP-MS, Microwave (ppm)	1	1	4.498							
041.53	Vanadium, ICP-MS, Microwave (ppm)	1	1	1.231							
042.00	Chloride, Titrimetric (%)	3	2	0.0625	0.0035	0.0625	0.0035				6.07%
042.01	Chloride, Ion-selective electrode (%)	2	2	0.0776	0.0176						
042.99	Chloride, Miscellaneous (%)	1	1	0.1000							
101.99	Choline Chloride, Miscellaneous (ppm)	1	1	2,485							
102.01	Niacin, Microbiological (ppm)	1	1	30.65							
103.01	Pantothenic Acid, Microbiological (ppm)	1	1	5.230							
104.00	Riboflavin, Fluorometric (ppm)	1	1	1.720							
105.01	Thiamine, Fluorometer (ppm)	1	1	3.375							
106.02	Vitamin A, LC (KU / kg)	10	2	19.41	25.73	19.41	25.73	22.74		2.621	
106.00	Vitamin A, Color (KU / kg)	1		0.3000							
106.01	Vitamin A, UV (KU / kg)	1		0.8000							
107.00	Vitamin B12, Microbiological (ppb)	1		4.400							
108.02	Vitamin D3, LC (KU / kg)	3	1								
109.02	Vitamin E, LC (IU / kg)	12	**9**	16.90	4.687	**15.98**	2.753	1.147	17.22%	1.234	
111.00	Vitamin C, Phosphorylated, LC (ppm)	1		4.400							
111.98	Vitamin C, Ascorbic Acid, Miscellaneous (ppm)	1		1.000							
112.01	Pyridoxine, LC (µg / g)	1	1	1.365							
113.01	Folic Acid, Micro (ppm)	1	1	1.965							
114.01	Biotin, Microbiological (ppm)	1	1	0.2030							
114.99	Biotin, Miscellaneous (ppm)	1	1	0.4320							
115.99	Non Protein N (NPN), Miscellaneous (%)	1	1	0.7313							
120.00	Alanine, Post-col Ninhydrin Der (%)	16	**16**	1.582	0.0435	**1.580**	0.0430	0.0134	2.72%	0.0248	3.73%
120.05	Alanine, Pre-col AQC Der (%)	7	**7**	1.533	0.2623	**1.492**	0.1940	0.0917	13.00%	0.0488	3.77%
120.02	Alanine, Post-col OPA Der (%)	1	1	1.575							

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120.99	Alanine, Miscellaneous (%)	1	1	1.645							
121.00	Arginine, Post-col Ninhydrin Der (%)	16	**16**	4.276	0.1010	**4.280**	0.1020	0.0319	2.38%	0.0608	3.21%
121.05	Arginine, Pre-col AQC Der (%)	7	**7**	4.199	0.4776	**4.225**	0.4794	0.2265	11.35%	0.1876	3.22%
121.02	Arginine, Post-col OPA Der (%)	1	1	4.101							
121.99	Arginine, Miscellaneous (%)	1	1	4.340							
122.00	Aspartic, Post-col Ninhydrin Der (%)	16	**16**	3.650	0.0927	**3.646**	0.0949	0.0297	2.60%	0.0569	3.29%
122.05	Aspartic, Pre-col AQC Der (%)	7	**7**	3.402	0.5258	**3.402**	0.5963	0.2817	17.53%	0.1369	3.33%
122.02	Aspartic, Post-col OPA Der (%)	1	1	3.677							
122.99	Aspartic, Miscellaneous (%)	1	1	3.785							
124.00	Cysteine/Cystine, PAO Post-col Ninhydri (%)	16	**16**	0.5993	0.0257	**0.5988**	0.0281	0.0088	4.69%	0.0151	4.32%
124.05	Cysteine/Cystine, PAO Pre-col AQC Der (%)	6	**6**	0.5511	0.0367	**0.5511**	0.0416	0.0212	7.55%	0.0332	4.37%
124.99	Cysteine/Cystine, Miscellaneous (%)	2	2	0.7326	0.2087						
124.02	Cysteine/Cystine, PAO Post-col OPA Der (%)	1	1	0.5980							
125.00	Glutamic, Post-col Ninhydrin Der (%)	16	**16**	7.904	0.2596	**7.905**	0.2758	0.0862	3.49%	0.1804	2.93%
125.05	Glutamic, Pre-col AQC Der (%)	7	**7**	7.449	0.7794	**7.449**	0.8838	0.4176	11.87%	0.1951	2.96%
125.02	Glutamic, Post-col OPA Der (%)	1	1	7.760							
125.99	Glutamic, Miscellaneous (%)	1	1	8.240							
126.00	Glycine, Post-col Ninhydrin Der (%)	16	**16**	1.688	0.1275	**1.662**	0.0513	0.0160	3.08%	0.0331	3.71%
126.05	Glycine, Pre-col AQC Der (%)	7	**7**	1.689	0.2991	**1.662**	0.1278	0.0604	7.69%	0.0409	3.71%
126.02	Glycine, Post-col OPA Der (%)	1	1	1.658							
126.99	Glycine, Miscellaneous (%)	1	1	1.745							
127.00	Histidine, Post-col Ninhydrin Der (%)	16	**16**	1.068	0.0923	**1.081**	0.0626	0.0196	5.79%	0.0257	3.95%
127.05	Histidine, Pre-col AQC Der (%)	7	**7**	1.089	0.1537	**1.101**	0.1248	0.0590	11.33%	0.0414	3.94%
127.02	Histidine, Post-col OPA Der (%)	1	1	1.031							
127.99	Histidine, Miscellaneous (%)	1	1	1.145							
128.00	Isoleucine, Post-col Ninhydrin Der (%)	16	**16**	1.247	0.0518	**1.248**	0.0568	0.0177	4.55%	0.0248	3.87%
128.05	Isoleucine, Pre-col AQC Der (%)	7	**7**	1.298	0.2085	**1.284**	0.2037	0.0962	15.87%	0.0431	3.85%
128.02	Isoleucine, Post-col OPA Der (%)	1	1	1.160							
128.99	Isoleucine, Miscellaneous (%)	1	1	1.345							
129.00	Leucine, Post-col Ninhydrin Der (%)	16	**16**	2.325	0.0576	**2.320**	0.0512	0.0160	2.21%	0.0330	3.52%
129.05	Leucine, Pre-col AQC Der (%)	7	**7**	2.238	0.2365	**2.284**	0.1487	0.0702	6.51%	0.0519	3.53%
129.02	Leucine, Post-col OPA Der (%)	1	1	2.217							
129.99	Leucine, Miscellaneous (%)	1	1	2.475							
130.00	L-Lysine, Post-col Ninhydrin Der (%)	16	**16**	1.636	0.0597	**1.632**	0.0565	0.0177	3.46%	0.0263	3.72%
130.05	L-Lysine, Pre-col AQC Der (%)	7	**6**	1.575	0.1794	**1.575**	0.2035	0.1038	12.92%	0.0271	3.74%
130.99	L-Lysine, Miscellaneous (%)	2	2	1.884	0.0928						
130.02	L-Lysine, Post-col OPA Der (%)	1	1	1.833							
131.00	Methionine, PAO Post-col Ninhydrin Der (%)	16	**16**	0.6034	0.0393	**0.5993**	0.0227	0.0071	3.79%	0.0172	4.32%
131.05	Methionine, PAO Pre-col AQC Der (%)	7	**7**	0.5588	0.0994	**0.5588**	0.1127	0.0532	20.17%	0.0266	4.37%
131.99	Methionine, Miscellaneous (%)	2	2	0.5501	0.1413						

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131.02	Methionine, PAO Post-col OPA Der (%)	1	1	0.5960							
132.00	Phenylalanine, Post-col Ninhydrin Der (%)	16	**16**	2.130	0.1036	**2.142**	0.0564	0.0176	2.63%	0.0438	3.57%
132.05	Phenylalanine, Pre-col AQC Der (%)	7	**7**	2.036	0.2421	**2.080**	0.1614	0.0763	7.76%	0.0974	3.58%
132.02	Phenylalanine, Post-col OPA Der (%)	1	1	2.064							
132.99	Phenylalanine, Miscellaneous (%)	1	1	2.245							
133.00	Proline, Post-col Ninhydrin Der (%)	16	**15**	1.489	0.1446	**1.510**	0.0740	0.0239	4.90%	0.0287	3.76%
133.05	Proline, Pre-col AQC Der (%)	7	**6**	1.450	0.2149	**1.450**	0.2437	0.1244	16.81%	0.0263	3.78%
133.99	Proline, Miscellaneous (%)	1	1	1.520							
134.00	Serine, Post-col Ninhydrin Der (%)	16	**15**	1.745	0.0539	**1.742**	0.0551	0.0178	3.16%	0.0223	3.68%
134.05	Serine, Pre-col AQC Der (%)	7	**7**	1.604	0.2786	**1.653**	0.1912	0.0903	11.57%	0.0543	3.71%
134.02	Serine, Post-col OPA Der (%)	1	1	1.533							
134.99	Serine, Miscellaneous (%)	1	1	1.790							
135.00	Threonine, Post-col Ninhydrin Der (%)	16	**16**	1.304	0.0515	**1.297**	0.0407	0.0127	3.14%	0.0206	3.85%
135.05	Threonine, Pre-col AQC Der (%)	7	**7**	1.243	0.2178	**1.292**	0.1156	0.0546	8.95%	0.0398	3.85%
135.99	Threonine, Miscellaneous (%)	2	2	1.409	0.0832						
135.02	Threonine, Post-col OPA Der (%)	1	1	1.235							
136.03	Tryptophan, Alka-Hydrol + IS RP LC Fl (%)	6	**6**	0.5222	0.0336	**0.5189**	0.0299	0.0153	5.77%	0.0045	4.41%
136.00	Tryptophan, Alka-Hydrol Post-col Ninhyd (%)	4	4	0.5341	0.0508	0.5341	0.0508	0.0254	9.52%	0.0160	4.40%
136.05	Tryptophan, Pre-col AQC Der (%)	3	3	0.4569	0.1170	0.4569	0.1170	0.0675	25.60%	0.0184	4.50%
136.01	Tryptophan, Alka-Hydrol Rev Phase LC UV (%)	2	2	0.5178	0.0074						
136.99	Tryptophan, Miscellaneous (%)	2	2	0.4240	0.0382						
136.02	Tryptophan, Alka-Hydrol Post-col OPA De (%)	1	1	0.5070							
137.00	Tyrosine, Post-col Ninhydrin Der (%)	11	**10**	1.104	0.1015	**1.097**	0.0987	0.0390	9.00%	0.0120	3.94%
137.05	Tyrosine, Pre-col AQC Der (%)	7	**7**	1.059	0.1725	**1.059**	0.1956	0.0924	18.46%	0.0484	3.97%
137.02	Tyrosine, Post-col OPA Der (%)	1	1	0.8195							
137.99	Tyrosine, Miscellaneous (%)	1	1	1.045							
138.00	Valine, Post-col Ninhydrin Der (%)	16	**16**	1.734	0.0845	**1.733**	0.0888	0.0278	5.12%	0.0288	3.68%
138.05	Valine, Pre-col AQC Der (%)	7	**7**	1.680	0.1482	**1.705**	0.1062	0.0502	6.23%	0.0477	3.69%
138.02	Valine, Post-col OPA Der (%)	1	1	1.770							
138.99	Valine, Miscellaneous (%)	1	1	1.925							
139.00	Taurine, Post-col Ninhydrin Der (%)	2	2	0.0830	0.0806						
139.05	Taurine, Pre-col AQC Der (%)	2	1	0.1580							
139.02	Taurine, Post-col OPA Der (%)	1		0.0100							
139.99	Taurine, Miscellaneous (%)	1		0.0100							
160.99	Fructose, Miscellaneous (%)	2	2	0.4850	0.5021						
160.10	Fructose, HPAEC PAD (%)	1	1	0.1100							
161.10	Galactose, HPAEC PAD (%)	1		0.0000							
162.10	Glucose, HPAEC PAD (%)	1		0.0000							
162.99	Glucose, Miscellaneous (%)	2		0.0500							
163.10	Lactose, HPAEC PAD (%)	1		0.0000							

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163.99	Lactose, Miscellaneous (%)	2		0.0500							
164.10	Maltose, HPAEC PAD (%)	1	1	0.1350							
164.99	Maltose, Miscellaneous (%)	2		0.0500							
165.99	Sucrose, Miscellaneous (%)	2	2	1.355	0.2828						
165.10	Sucrose, HPAEC PAD (%)	1	1	1.275							
166.10	Raffinose, HPAEC PAD (%)	1	1	4.300							
166.99	Raffinose, Miscellaneous (%)	1	1	3.975							
167.10	Stachyose, HPAEC PAD (%)	1	1	0.7850							
167.99	Stachyose, Miscellaneous (%)	1	1	0.7650							
351.03	Chlortetracycline, LC (UV or FL) (ppm)	1		1.000							
354.01	Decoquinate, LC (UV or FL) (ppm)	1		0.3000							
365.02	Monensin, LC (ppm)	1		0.1000							
367.99	Nicarbazin, Miscellaneous (ppm)	1		0.1000							
388.03	Tylosin, LC (ppm)	1		0.6000							
392.99	Fenbendazole, Miscellaneous (ppm)	1		1.000							
400.01	Water Activity, Aqualab chilled mirror (Units)	11	**10**	0.5541	0.0116	**0.5546**	0.0118	0.0047	2.13%	0.0030	
400.99	Water Activity, Miscellaneous (Units)	1	1	0.5490							
516.53	Arsenic, Total (As), ICP-MS, Microwave (ppm)	3	3	0.0567	0.0166	0.0567	0.0166	0.0096	29.32%	0.0114	22.00%
516.00	Arsenic, Total (As), AA, Hydride (ppm)	2	2	0.0444	0.0246						
516.43	Arsenic, Total (As), ICP, Microwave (ppm)	1		20.00							
516.52	Arsenic, Total (As), ICP-MS, Open vessel (ppm)	2		0.0500							
518.53	Cadmium, ICP-MS, Microwave (ppm)	3	3	0.0536	0.0066	0.0536	0.0066	0.0038	12.25%	0.0065	22.00%
518.43	Cadmium, ICP, Microwave (ppm)	3	2	0.0694	0.0362	0.0694	0.0362				22.00%
518.34	Cadmium, AAS, Graphite furnace (ppm)	1	1	0.0519							
518.41	Cadmium, ICP, Dry ash (ppm)	1	1	0.0494							
518.42	Cadmium, ICP, Open vessel (ppm)	1	1	0.0585							
518.52	Cadmium, ICP-MS, Open vessel (ppm)	1	1	0.0528							
518.99	Cadmium, Miscellaneous (ppm)	1	1	0.0591							
520.43	Chromium, Total (Cr), ICP, Microwave (ppm)	7	**7**	29.85	49.36	**12.68**	5.782	2.732	45.60%	2.283	10.91%
520.42	Chromium, Total (Cr), ICP, Open vessel (ppm)	3	3	9.137	4.561	9.137	4.561	2.633	49.91%	0.9447	11.47%
520.53	Chromium, Total (Cr), ICP-MS, Microwave (ppm)	3	3	8.444	5.730	8.444	5.730	3.308	67.85%	0.7906	11.60%
520.41	Chromium, Total (Cr), ICP, Dry ash (ppm)	1	1	9.511							
520.52	Chromium, Total (Cr), ICP-MS, Open vessel (ppm)	1	1	1.410							
526.53	Lead, ICP-MS, Microwave (ppm)	3	3	0.1357	0.0171	0.1357	0.0171	0.0099	12.58%	0.0089	21.61%
526.34	Lead, AAS, Graphite furnace (ppm)	1	1	0.2276							
526.41	Lead, ICP, Dry ash (ppm)	1	1	0.3263							
526.42	Lead, ICP, Open vessel (ppm)	1	1	0.1675							
526.43	Lead, ICP, Microwave (ppm)	2	1	0.2728							
526.52	Lead, ICP-MS, Open vessel (ppm)	2	1	0.1202							
529.99	Mercury, Miscellaneous (ppb)	5	2	9.863	0.4761	9.863	0.4761			0.2955	22.00%

Test Material Code # 202328 **(Precision Report Follows)** **Issue Date : 09/30/2023**

Method Code	Analyte and Method	Total # Labs Submitting	# Labs in Robust Calcs	Raw Mean	Raw SD	Assigned Value Robust Mean	AAFCO ffp Robust SD	Uncertainty (U) - Robust	% RSD - Robust	Average Range (Rob R-bar)	Thompson Horwitz %RSD
539.43	Nickel, ICP, Microwave (ppm)	5	4	4.922	1.436	4.922	1.436	0.7180	29.17%	1.354	12.59%
539.41	Nickel, ICP, Dry ash (ppm)	1	1	5.264							
539.42	Nickel, ICP, Open vessel (ppm)	1	1	5.510							
539.52	Nickel, ICP-MS, Open vessel (ppm)	1	1	1.303							
539.53	Nickel, ICP-MS, Microwave (ppm)	1	1	3.890							
702.00	Butyric Acid (4:0), Miscellaneous GC (%)	1		0.0200							
704.00	Caproic Acid (6:0) , Miscellaneous GC (%)	1		0.0200							
706.99	Caprylic acid (8:0), Miscellaneous (% (w/w))	1		0.0200							
708.99	Capric acid (10:0), Miscellaneous (% (w/w))	1		0.0200							
710.99	Lauric Acid (12:0), Miscellaneous (% (w/w))	3									
714.99	Myristic Acid (14:0), Miscellaneous (% (w/w))	2	2	0.0316	0.0042						
716.99	Palmitic Acid (16:0), Miscellaneous (% (w/w))	2	2	1.093	0.0155						
718.99	Palmitoleic Acid (9c-16:1), Miscellaneous (% (w/w))	3	3	0.0230	0.0009	0.0230	0.0009	0.0006	3.87%	0.0008	7.06%
720.99	Margaric acid (17:0), Miscellaneous (% (w/w))	1		0.0200							
722.99	Stearic Acid (18:0), Miscellaneous (% (w/w))	2	2	0.1323	0.0025						
724.99	Oleic Acid (9c-18:1), Miscellaneous (% (w/w))	2	2	0.7151	0.0142						
726.99	Linoleic Acid (9c,12c-18:2), Miscellaneous (% (w/w))	3	3	2.220	0.0952	2.220	0.0952	0.0550	4.29%	0.0624	3.55%
728.99	alpha-Linolenic Acid (9c,12c,15c-18:3), Miscellaneous (% (w/w))	3	3	0.0199	0.0008	0.0199	0.0008	0.0006	4.06%		7.21%
730.99	Arachidic Acid (20:0), Miscellaneous (% (w/w))	2	1	0.0164							
732.99	Gondoic Acid (11c-20:1), Miscellaneous (% (w/w))	2		0.0050							
736.99	Arachidonic Acid (5c,8c,11c,14c-20:4), Miscellaneous (% (w/w))	2		0.0000							
740.99	Eicosapentaenoic Acid EPA (5c,8c,11c,14c,17c-20:5), Miscellaneous (% (w/w	3									
742.99	Behenic Acid (22:0), Miscellaneous (% (w/w))	2	1	0.0141							
744.99	Erucic Acid (13c-22:1), Miscellaneous (% (w/w))	2		0.0050							
746.99	Docosapentaenoic Acid n-3 DPA (7c,10c,13c,16c,19c-22:5), Miscellaneous (%	3									
748.99	Lignoceric Acid (24:0), Miscellaneous (% (w/w))	2	1	0.0105							
750.99	Docosahexaenoic Acid DHA (4c,7c,10c,13c,16c,19c-22:6), Miscellaneous (%	3									
752.99	Nervonic Acid (24:1) isomers, Miscellaneous (% (w/w))	2	1	0.0365							
754.99	Total n-3 Polyunsaturated (Omega-3) Fatty Acids, Miscellaneous (% (w/w))	2	2	0.0210	0.0014						
756.99	Total n-6 Polyunsaturated (Omega-6) Fatty Acids, Miscellaneous (% (w/w))	2	2	2.212	0.1315						
758.99	Total Saturated Fatty Acids, Miscellaneous (% (w/w))	1	1	1.329							
764.99	Total cis Monounsaturated Fatty Acids, Miscellaneous (% (w/w))	1	1	0.8180							
768.99	Total cis Polyunsaturated Fatty Acids, Miscellaneous (% (w/w))	1	1	2.161							
770.99	Total Fat (equivalent to NLEA), Miscellaneous (% (w/w))	1	1	4.526							
772.99	Total Fatty Acids, Miscellaneous (% (w/w))	2	2	4.329	0.0034						

Notes: Robust statistics not used if < 6 labs reporting. In this case Means and SD's may be reported based on Raw Data with obvious blunders removed. Robust Assigned Values indicated in bold font.

Association of American Feed Control Officials

ANAB ACCREDITED ISO/IEC 17043 PROFICIENCY TESTING PROVIDER

AAFCO PTP Animal Feed Scheme

Animal Feed Scheme

Cottonseed Meal

Test Material Code # 202328

Method Precision Report

 # Methods Reported: 118

 # Labs Reporting: 166

Issue Date : 09/30/2023

Method Code	Analyte and Method	Total # Labs Submitting	# Labs used in Precision Calcs	Precision Mean	Precision SD	Between Labs sL	Within Labs sr	Reproducibility sR	Between Labs %RSD	Within Labs %rsd	Reproducibility %RSD	sR/sr
001.07	Loss on Drying, 104°C 3 hr, in malt (%)	48	43	8.674	0.6488	0.3964	0.1027	0.4095	4.52%	1.17%	4.67%	3.989
001.99	Loss on Drying, Miscellaneous (%)	23	22	8.611	0.8569	0.8541	0.0976	0.8597	9.92%	1.13%	9.98%	8.807
002.01	Protein, Crude, Auto Kjel-Foss (%)	19	18	40.53	0.5203	0.4064	0.2033	0.4544	1.00%	0.50%	1.12%	2.236
002.05	Protein, Crude, Copper, Boric Acid (%)	22	20	40.25	0.6178	0.6024	0.1943	0.6329	1.50%	0.48%	1.57%	3.257
002.06	Protein, Crude, Combustion Nitrogen Analyzer (%)	110	103	40.97	0.7089	0.4862	0.4551	0.6659	1.18%	1.11%	1.62%	1.463
003.00	Fat, Crude, Diethyl Ether Ext., Direct (%)	9	7	3.703	0.3929	0.3707	0.0204	0.3712	9.83%	0.54%	9.85%	18.24
003.06	Fat, Crude, Pet Ether (%)	14	13	3.388	0.3517	0.3467	0.0839	0.3567	10.23%	2.48%	10.53%	4.252
003.09	Fat, Crude, Randall, Diethyl Ether Ext (%)	9	8	3.548	0.1227	0.1025	0.1056	0.1471	2.88%	2.97%	4.13%	1.393
003.10	Fat, Crude, Randall, Pet Ether (%)	31	29	3.227	0.2308	0.2230	0.0936	0.2418	6.92%	2.90%	7.51%	2.584
003.13	Fat, Crude, Randall, Hexane Ext. (%)	6	5	3.432	0.5614	0.6197	0.0352	0.6207	17.87%	1.02%	17.90%	17.63
003.14	Fat, Crude, Ankom (%)	58	54	3.365	0.3827	0.3511	0.1469	0.3806	10.49%	4.39%	11.37%	2.590
004.00	Fiber, Crude, Asbestos Free (%)	12	12	12.80	1.082	0.9919	0.6097	1.164	7.75%	4.76%	9.10%	1.910
004.06	Fiber, Crude, Fibertec (%)	17	16	11.87	1.056	1.049	0.1734	1.063	8.84%	1.46%	8.96%	6.131
004.07	Fiber, Crude, ANKOM (%)	74	66	12.48	1.522	1.066	0.2856	1.104	8.69%	2.33%	9.00%	3.866
005.00	Ash, 2h @ 600°C (%)	95	86	7.866	0.1703	0.1304	0.0610	0.1439	1.66%	0.78%	1.83%	2.358
005.05	Ash, 3h @ 550°C (%)	26	23	7.975	0.1724	0.0821	0.0539	0.0982	1.03%	0.68%	1.23%	1.823
005.99	Ash, Miscellaneous (%)	10	9	7.991	0.1648	0.1620	0.0424	0.1675	2.03%	0.53%	2.10%	3.953
008.02	Fiber, Acid Detergent, Crucible (%)	10	9	17.10	0.5244	0.2588	0.3381	0.4258	1.50%	1.96%	2.47%	1.259
008.08	Fiber, Acid Detergent, Filter Bag - ANKOM (%)	49	45	18.34	1.906	1.710	0.4621	1.771	9.37%	2.53%	9.70%	3.832
009.07	Fiber, Neutral Detergent, AOAC -ENZ Pretreat (%)	10	10	24.55	2.382	2.340	0.6328	2.424	9.53%	2.58%	9.87%	3.831
009.09	Fiber, Neutral Detergent, Filter Bag - ANKOM (%)	45	41	26.75	3.508	2.932	0.6436	3.002	11.10%	2.44%	11.36%	4.664
010.99	Moisture, Miscellaneous (%)	14	12	8.679	0.7508	0.5179	0.0937	0.5263	5.84%	1.06%	5.93%	5.618
011.01	Loss on Drying, HT, 135°C 2hr (%)	64	56	9.581	0.6414	0.4077	0.1053	0.4211	4.21%	1.09%	4.35%	3.999
012.00	Starch, Polarimetric (Ewers) (%)	9	9	2.553	1.352	1.346	0.1761	1.358	52.74%	6.90%	53.19%	7.712
012.01	Starch, Enzymatic-Colorimetric Method (Megazyme) (%)	10	7	0.6518	0.6385	0.1335	0.0915	0.1618	30.95%	21.22%	37.52%	1.768
012.04	Starch, Enzymatic-Enzyme Membrane Technology (YSI) (%)	8	7	2.489	3.295	1.183	0.0848	1.186	85.08%	6.10%	85.30%	13.99
013.00	Fat, Pretreat, Acid hydrolysis (%)	16	14	4.833	0.7319	0.7536	0.0972	0.7598	15.54%	2.01%	15.67%	7.813
013.02	Fat, Pretreat, Mojonnier, Bak Ext, Acid hydrolysis (%)	14	13	4.651	0.9814	0.9711	0.1997	0.9915	20.88%	4.29%	21.32%	4.964
013.10	Fat, Pretreat, Soxtec-Acid Hydrolysis (%)	7	6	4.179	0.4892	0.4966	0.0502	0.4991	12.08%	1.22%	12.14%	9.943
013.13	Fat, Pretreat, Ankom- Acid Hydrolysis (%)	8	8	4.526	0.8288	0.8014	0.2991	0.8554	17.71%	6.61%	18.90%	2.860
015.43	Aluminum, ICP, Microwave (ppm)	6	5	468.5	92.45	30.29	8.243	31.39	7.00%	1.91%	7.26%	3.808
019.08	Calcium, EDTA (%)	12	12	0.2950	0.0921	0.0919	0.0072	0.0922	31.17%	2.45%	31.26%	12.78
019.31	Calcium, AAS, Dry ash (%)	20	18	0.2482	0.0413	0.0289	0.0071	0.0298	11.35%	2.77%	11.68%	4.213
019.41	Calcium, ICP, Dry ash (%)	22	19	0.2612	0.0307	0.0168	0.0060	0.0179	6.65%	2.39%	7.06%	2.956
019.42	Calcium, ICP, Open vessel (%)	20	18	0.2599	0.0244	0.0242	0.0076	0.0254	9.35%	2.95%	9.81%	3.326
019.43	Calcium, ICP, Microwave (%)	32	29	0.2501	0.0216	0.0180	0.0093	0.0203	7.27%	3.76%	8.18%	2.179

Method Code	Analyte and Method	Total # Labs Submitting	# Labs used in Precision Calcs	Precision Mean	Precision SD	Between Labs sL	Within Labs sr	Reproducibility sR	Between Labs %RSD	Within Labs %rsd	Reproducibility %RSD	sR/sr
019.99	Calcium, Miscellaneous (%)	7	6	0.2479	0.0280	0.0120	0.0082	0.0145	5.02%	3.43%	6.08%	1.775
021.42	Cobalt, ICP, Open vessel (ppm)	5	5	5.988	2.801	2.622	1.394	2.970	43.79%	23.29%	49.60%	2.130
021.43	Cobalt, ICP, Microwave (ppm)	10	10	8.182	2.163	2.139	0.4500	2.186	26.14%	5.50%	26.72%	4.857
022.31	Copper, AAS, Dry ash (ppm)	9	8	12.08	1.646	1.640	0.1988	1.652	13.57%	1.65%	13.67%	8.306
022.41	Copper, ICP, Dry ash (ppm)	16	15	12.39	1.707	1.565	0.9657	1.839	12.63%	7.79%	14.84%	1.904
022.42	Copper, ICP, Open vessel (ppm)	21	17	11.42	1.107	0.8772	0.3506	0.9447	7.82%	3.13%	8.42%	2.694
022.43	Copper, ICP, Microwave (ppm)	30	27	11.31	1.119	0.8476	0.4943	0.9811	7.59%	4.43%	8.79%	1.985
025.31	Iron, AAS, Dry ash (ppm)	11	10	354.5	66.02	66.12	4.167	66.25	18.98%	1.20%	19.02%	15.90
025.41	Iron, ICP, Dry ash (ppm)	19	18	386.1	35.74	24.90	14.19	28.66	6.36%	3.62%	7.32%	2.020
025.42	Iron, ICP, Open vessel (ppm)	19	16	302.6	94.96	76.71	9.269	77.27	23.88%	2.89%	24.05%	8.336
025.43	Iron, ICP, Microwave (ppm)	28	25	385.3	56.28	44.93	15.58	47.56	11.60%	4.02%	12.28%	3.053
027.31	Magnesium, AAS, Dry ash (%)	8	8	0.6052	0.0331	0.0323	0.0099	0.0338	5.34%	1.64%	5.58%	3.399
027.41	Magnesium, ICP, Dry ash (%)	18	18	0.6348	0.0287	0.0274	0.0122	0.0300	4.31%	1.92%	4.72%	2.458
027.42	Magnesium, ICP, Open vessel (%)	21	19	0.6338	0.0290	0.0224	0.0101	0.0245	3.55%	1.60%	3.89%	2.431
027.43	Magnesium, ICP, Microwave (%)	30	27	0.6164	0.0347	0.0322	0.0113	0.0341	5.24%	1.84%	5.55%	3.021
028.31	Manganese, AAS, Dry ash (ppm)	10	10	34.14	8.263	8.253	0.5952	8.274	24.17%	1.74%	24.24%	13.90
028.41	Manganese, ICP, Dry ash (ppm)	16	15	40.04	3.005	1.811	1.120	2.129	4.59%	2.84%	5.40%	1.901
028.42	Manganese, ICP, Open vessel (ppm)	22	21	40.58	2.532	2.289	1.528	2.753	5.64%	3.77%	6.78%	1.801
028.43	Manganese, ICP, Microwave (ppm)	28	25	39.96	3.050	2.212	1.377	2.605	5.53%	3.44%	6.51%	1.892
031.01	Phosphorus, Photometric (%)	36	30	1.148	0.0505	0.0413	0.0090	0.0423	3.57%	0.78%	3.66%	4.681
031.41	Phosphorus, ICP, Dry ash (%)	21	19	1.184	0.0695	0.0462	0.0209	0.0507	3.93%	1.78%	4.31%	2.426
031.42	Phosphorus, ICP, Open vessel (%)	21	20	1.185	0.0854	0.0701	0.0358	0.0787	5.97%	3.05%	6.70%	2.201
031.43	Phosphorus, ICP, Microwave (%)	34	30	1.169	0.0747	0.0576	0.0367	0.0683	4.96%	3.17%	5.88%	1.859
031.99	Phosphorus, Miscellaneous (%)	6	6	1.119	0.0867	0.0842	0.0296	0.0892	7.52%	2.64%	7.97%	3.016
032.31	Potassium, AAS, Dry ash (%)	8	8	1.613	0.0869	0.0827	0.0377	0.0909	5.13%	2.33%	5.64%	2.414
032.41	Potassium, ICP, Dry ash (%)	19	17	1.687	0.1356	0.0571	0.0466	0.0737	3.45%	2.82%	4.45%	1.580
032.42	Potassium, ICP, Open vessel (%)	20	18	1.680	0.1226	0.1091	0.0343	0.1144	6.55%	2.06%	6.86%	3.336
032.43	Potassium, ICP, Microwave (%)	33	31	1.644	0.0687	0.0670	0.0276	0.0725	4.08%	1.68%	4.41%	2.625
032.99	Potassium, Miscellaneous (%)	6	6	1.649	0.1023	0.1006	0.0257	0.1039	6.10%	1.56%	6.30%	4.041
033.01	Salt as chloride, Poten Cl (%)	20	18	0.1124	0.0442	0.0345	0.0067	0.0352	32.58%	6.34%	33.20%	5.238
034.53	Selenium, Total (Se), ICP-MS, Microwave (ppm)	7	6	0.1742	0.0413	0.0407	0.0102	0.0419	23.35%	5.84%	24.07%	4.117
035.31	Sodium, AAS, Dry ash (%)	9	8	0.1936	0.0497	0.0529	0.0017	0.0529	27.52%	0.86%	27.53%	31.87
035.41	Sodium, ICP, Dry ash (%)	21	17	0.2238	0.0166	0.0050	0.0051	0.0071	2.25%	2.27%	3.20%	1.409
035.42	Sodium, ICP, Open vessel (%)	18	15	0.2234	0.0141	0.0094	0.0053	0.0108	4.28%	2.43%	4.92%	2.027
035.43	Sodium, ICP, Microwave (%)	28	25	0.2281	0.0272	0.0117	0.0063	0.0133	5.25%	2.83%	5.96%	2.110
036.04	Sulfur, LECO (%)	6	6	0.4383	0.0145	0.0095	0.0154	0.0181	2.16%	3.52%	4.13%	1.173
036.42	Sulfur, ICP, Open vessel (%)	19	18	0.4262	0.0225	0.0198	0.0132	0.0238	4.64%	3.08%	5.57%	1.807
036.43	Sulfur, ICP, Microwave (%)	25	22	0.4496	0.0235	0.0224	0.0099	0.0244	4.98%	2.20%	5.45%	2.480
037.31	Zinc, AAS, Dry ash (ppm)	10	9	71.80	6.293	3.635	1.620	3.980	4.95%	2.21%	5.42%	2.457
037.41	Zinc, ICP, Dry ash (ppm)	17	15	77.69	7.241	5.072	2.646	5.721	6.64%	3.46%	7.48%	2.162
037.42	Zinc, ICP, Open vessel (ppm)	21	19	74.27	6.460	5.196	2.975	5.988	6.92%	3.96%	7.97%	2.013
037.43	Zinc, ICP, Microwave (ppm)	32	30	74.59	8.051	5.583	2.834	6.261	7.59%	3.85%	8.51%	2.209
037.99	Zinc, Miscellaneous (ppm)	5	5	70.20	5.060	2.921	5.843	6.533	4.16%	8.32%	9.31%	1.118
038.43	Molybdenum, ICP, Microwave (ppm)	8	8	1.011	0.3656	0.3452	0.1701	0.3849	34.16%	16.83%	38.08%	2.263
109.02	Vitamin E, LC (IU / kg)	12	8	16.90	4.687	1.883	0.9485	2.108	12.17%	6.13%	13.63%	2.222
120.00	Alanine, Post-col Ninhydrin Der (%)	16	14	1.582	0.0435	0.0340	0.0181	0.0385	2.16%	1.15%	2.44%	2.131

Test Material Code # 202328 **Issue Date : 09/30/2023**

Method Code	Analyte and Method	Total # Labs Submitting	# Labs used in Precision Calcs	Precision Mean	Precision SD	Between Labs sL	Within Labs sr	Reproducibility sR	Between Labs %RSD	Within Labs %rsd	Reproducibility %RSD	sR/sr
120.05	Alanine, Pre-col AQC Der (%)	7	6	1.533	0.2623	0.1213	0.0363	0.1266	8.40%	2.51%	8.77%	3.487
121.00	Arginine, Post-col Ninhydrin Der (%)	16	16	4.276	0.1010	0.0919	0.0594	0.1094	2.15%	1.39%	2.56%	1.841
121.05	Arginine, Pre-col AQC Der (%)	7	7	4.199	0.4776	0.4701	0.1187	0.4849	11.20%	2.83%	11.55%	4.086
122.00	Aspartic, Post-col Ninhydrin Der (%)	16	16	3.650	0.0927	0.0854	0.0511	0.0995	2.34%	1.40%	2.73%	1.948
122.05	Aspartic, Pre-col AQC Der (%)	7	7	3.402	0.5258	0.5195	0.1145	0.5320	15.27%	3.37%	15.64%	4.645
124.00	Cysteine/Cystine, PAO Post-col Ninhydri (%)	16	15	0.5993	0.0257	0.0257	0.0098	0.0275	4.29%	1.64%	4.59%	2.803
124.05	Cysteine/Cystine, PAO Pre-col AQC Der (%)	6	6	0.5511	0.0367	0.0314	0.0268	0.0413	5.69%	4.87%	7.49%	1.538
125.00	Glutamic, Post-col Ninhydrin Der (%)	16	15	7.904	0.2596	0.2336	0.1472	0.2761	2.95%	1.86%	3.48%	1.876
125.05	Glutamic, Pre-col AQC Der (%)	7	7	7.449	0.7794	0.7739	0.1308	0.7849	10.39%	1.76%	10.54%	6.002
126.00	Glycine, Post-col Ninhydrin Der (%)	16	15	1.688	0.1275	0.0380	0.0245	0.0452	2.30%	1.48%	2.73%	1.848
126.05	Glycine, Pre-col AQC Der (%)	7	7	1.689	0.2991	0.2984	0.0281	0.2997	17.67%	1.66%	17.74%	10.66
127.00	Histidine, Post-col Ninhydrin Der (%)	16	14	1.068	0.0923	0.0461	0.0181	0.0496	4.27%	1.68%	4.58%	2.733
127.05	Histidine, Pre-col AQC Der (%)	7	6	1.089	0.1537	0.1272	0.0177	0.1285	12.10%	1.68%	12.22%	7.253
128.00	Isoleucine, Post-col Ninhydrin Der (%)	16	16	1.247	0.0518	0.0491	0.0234	0.0544	3.94%	1.87%	4.36%	2.328
128.05	Isoleucine, Pre-col AQC Der (%)	7	7	1.298	0.2085	0.2076	0.0265	0.2093	16.00%	2.04%	16.13%	7.903
129.00	Leucine, Post-col Ninhydrin Der (%)	16	13	2.325	0.0576	0.0363	0.0206	0.0417	1.57%	0.89%	1.80%	2.029
129.05	Leucine, Pre-col AQC Der (%)	7	6	2.238	0.2365	0.0912	0.0373	0.0986	3.93%	1.61%	4.25%	2.641
130.00	L-Lysine, Post-col Ninhydrin Der (%)	16	15	1.636	0.0597	0.0452	0.0200	0.0494	2.78%	1.23%	3.04%	2.465
130.05	L-Lysine, Pre-col AQC Der (%)	7	6	1.575	0.1794	0.1790	0.0174	0.1798	11.37%	1.11%	11.42%	10.31
131.00	Methionine, PAO Post-col Ninhydrin Der (%)	16	15	0.6034	0.0393	0.0284	0.0124	0.0310	4.76%	2.07%	5.19%	2.506
131.05	Methionine, PAO Pre-col AQC Der (%)	7	7	0.5588	0.0994	0.0984	0.0198	0.1004	17.61%	3.55%	17.96%	5.065
132.00	Phenylalanine, Post-col Ninhydrin Der (%)	16	15	2.130	0.1036	0.0509	0.0345	0.0615	2.36%	1.61%	2.86%	1.780
132.05	Phenylalanine, Pre-col AQC Der (%)	7	6	2.036	0.2421	0.0889	0.0739	0.1156	4.19%	3.49%	5.45%	1.564
133.00	Proline, Post-col Ninhydrin Der (%)	16	13	1.489	0.1446	0.0690	0.0199	0.0719	4.54%	1.31%	4.73%	3.607
133.05	Proline, Pre-col AQC Der (%)	7	6	1.450	0.2149	0.2146	0.0158	0.2152	14.80%	1.09%	14.84%	13.65
134.00	Serine, Post-col Ninhydrin Der (%)	16	14	1.745	0.0539	0.0549	0.0143	0.0567	3.15%	0.82%	3.25%	3.963
134.05	Serine, Pre-col AQC Der (%)	7	6	1.604	0.2786	0.1192	0.0378	0.1251	7.01%	2.22%	7.35%	3.312
135.00	Threonine, Post-col Ninhydrin Der (%)	16	14	1.304	0.0515	0.0322	0.0159	0.0359	2.49%	1.23%	2.78%	2.260
135.05	Threonine, Pre-col AQC Der (%)	7	6	1.243	0.2178	0.0707	0.0304	0.0769	5.35%	2.30%	5.82%	2.533
136.03	Tryptophan, Alka-Hydrol + IS RP LC Fl (%)	6	6	0.5222	0.0336	0.0335	0.0031	0.0337	6.42%	0.59%	6.45%	10.91
137.00	Tyrosine, Post-col Ninhydrin Der (%)	11	9	1.104	0.1015	0.1042	0.0071	0.1045	9.51%	0.65%	9.53%	14.63
137.05	Tyrosine, Pre-col AQC Der (%)	7	7	1.059	0.1725	0.1708	0.0340	0.1741	16.12%	3.21%	16.44%	5.122
138.00	Valine, Post-col Ninhydrin Der (%)	16	15	1.734	0.0845	0.0861	0.0205	0.0885	4.97%	1.18%	5.11%	4.318
138.05	Valine, Pre-col AQC Der (%)	7	6	1.680	0.1482	0.0630	0.0355	0.0723	3.64%	2.05%	4.18%	2.037
400.01	Water Activity, Aqualab chilled mirror (Units)	11	9	0.5541	0.0116	0.0087	0.0021	0.0090	1.57%	0.37%	1.61%	4.328
520.43	Chromium, Total (Cr), ICP, Microwave (ppm)	7	6	29.85	49.36	3.505	1.651	3.874	31.19%	14.69%	34.48%	2.347

Notes: Precision Calculations provided for methods with 5 or more labs contributing to calculations.