



**AAFCO**  
Association of American Feed Control Officials



**Animal Feed Scheme**  
**Beef Starter, Medicated**  
**Test Material Code # 202323**

**Method Summary Report**  
(Precision Report Follows)

**# Labs Reporting: 160**  
**# Methods Reported: 378**  
**Issue Date : 04/30/2023**

Method Code	Analyte and Method	Total # Labs Submitting	# Labs in Robust Calcs	Raw Mean	Raw SD	Assigned Value Robust Mean	AAFCO #fp 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 (%)	46	44	8.328	0.3190	8.357	0.2674	0.0504	3.20%	0.0970	2.91%
001.99	Loss on Drying, Miscellaneous (%)	16	15	8.021	0.5673	8.053	0.5636	0.1819	7.00%	0.1206	2.92%
001.00	Loss on Drying, Vac 95°C 5 hr (%)	5	5	8.406	0.1616	8.406	0.1616	0.0723	1.92%	0.0892	2.90%
001.03	Loss on Drying, Low temp. methods (%)	1	1	8.480							
001.05	Loss on Drying, LECO (%)	1	1	8.246							
001.08	Loss on Drying, 102°C 16 hr, in meat (%)	1	1	8.692							
002.06	Protein, Crude, Combustion Nitrogen Analyzer (%)	109	108	18.90	0.2945	18.91	0.2319	0.0279	1.23%	0.1725	2.30%
002.05	Protein, Crude, Copper, Boric Acid (%)	24	24	18.67	0.3469	18.62	0.2699	0.0689	1.45%	0.1568	2.32%
002.01	Protein, Crude, Auto Kjel-Foss (%)	21	20	18.64	0.2556	18.63	0.2508	0.0701	1.35%	0.0881	2.32%
002.11	Protein, Crude, NIR (%)	3	3	19.42	0.3960	19.42	0.3960	0.2286	2.04%	0.1533	2.27%
002.08	Protein, Crude, Cu/Ti (%)	2	2	18.43	0.2425						
002.00	Protein, Crude, Crude (%)	1	1	18.85							
002.02	Protein, Crude, Semiauto Autoanalyzer (%)	1	1	18.76							
002.04	Protein, Crude, Copper Catalyst (%)	1	1	18.71							
003.14	Fat, Crude, Ankom (%)	49	49	4.134	0.3503	4.177	0.2579	0.0461	6.17%	0.1462	3.23%
003.10	Fat, Crude, Randall, Pet Ether (%)	28	27	4.064	0.2977	4.077	0.2140	0.0515	5.25%	0.0806	3.24%
003.06	Fat, Crude, Pet Ether (%)	16	16	4.236	0.2521	4.227	0.2639	0.0825	6.24%	0.1825	3.22%
003.00	Fat, Crude, Diethyl Ether Ext., Direct (%)	12	12	4.517	0.6281	4.369	0.2072	0.0748	4.74%	0.1010	3.20%
003.09	Fat, Crude, Randall, Diethyl Ether Ext (%)	9	8	4.128	0.3659	4.223	0.1405	0.0621	3.33%	0.0503	3.22%
003.13	Fat, Crude, Randall, Hexane Ext. (%)	5	5	3.975	0.4470	3.975	0.4470	0.1999	11.24%	0.1852	3.25%
003.01	Fat, Crude, Diethyl Ether Ext (13th ed.), Indirect (%)	3	3	4.108	0.2083	4.108	0.2083	0.1203	5.07%	0.0383	3.23%
003.12	Fat, Crude, Hexane Ext (%)	3	3	4.295	0.1361	4.295	0.1361	0.0786	3.17%	0.1500	3.21%
003.11	Fat, Crude, NIR (%)	2	2	5.720	1.138						
003.99	Fat, Crude, Miscellaneous (%)	1	1	7.630							
004.07	Fiber, Crude, ANKOM (%)	71	69	14.09	1.095	13.95	0.7696	0.1158	5.52%	0.2364	2.68%
004.06	Fiber, Crude, Fibertec (%)	21	21	13.83	0.9026	13.86	0.7370	0.2010	5.32%	0.2782	2.69%
004.00	Fiber, Crude, Asbestos Free (%)	10	10	14.48	0.8953	14.30	0.5032	0.1989	3.52%	0.1876	2.64%
004.03	Fiber, Crude, Fritted Glass (%)	4	3	13.36	1.105	13.36	1.105	0.6382	8.27%	0.0633	2.71%

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004.11	Fiber, Crude, NIR (%)	2	2	13.88	0.7849						
004.99	Fiber, Crude, Miscellaneous (%)	2	2	13.16	0.5501						
005.00	Ash, 2h @ 600°C (%)	86	84	6.597	0.2130	6.601	0.2098	0.0286	3.18%	0.0624	3.01%
005.05	Ash, 3h @ 550°C (%)	23	22	6.855	0.1861	6.856	0.1929	0.0514	2.81%	0.0492	2.99%
005.99	Ash, Miscellaneous (%)	8	8	6.812	0.2977	6.813	0.3343	0.1478	4.91%	0.0766	3.00%
005.11	Ash, NIR (%)	2	2	6.335	0.0495						
005.02	Ash, LECO (%)	1	1	7.104							
005.03	Ash, Microwave furnace (%)	1	1	6.300							
006.99	Total Sugars, Miscellaneous (%)	6	6	4.157	1.541	4.157	1.747	0.8915	42.03%	0.0900	3.23%
006.00	Total Sugars, As sucrose (%)	3	3	4.137	0.8780	4.137	0.8780	0.5069	21.22%	0.1667	3.23%
006.01	Total Sugars, Mod. Fehling Soln (%)	1	1	5.515							
008.08	Fiber, Acid Detergent, Filter Bag - ANKOM (%)	45	43	19.16	1.374	19.21	1.241	0.2366	6.46%	0.2833	2.28%
008.02	Fiber, Acid Detergent, Crucible (%)	13	13	19.13	1.103	19.21	0.9668	0.3352	5.03%	0.2177	2.28%
008.99	Fiber, Acid Detergent, Miscellaneous (%)	3	3	19.16	0.6215	19.16	0.6215	0.3588	3.24%	0.3247	2.28%
009.09	Fiber, Neutral Detergent, Filter Bag - ANKOM (%)	43	42	35.66	1.296	35.69	1.335	0.2574	3.74%	0.4987	1.67%
009.07	Fiber, Neutral Detergent, AOAC -ENZ Pretreat (%)	12	12	36.74	0.6050	36.79	0.5603	0.2022	1.52%	0.5598	1.65%
009.99	Fiber, Neutral Detergent, Miscellaneous (%)	2	2	38.49	6.102						
010.99	Moisture, Miscellaneous (%)	14	14	8.452	0.3103	8.452	0.3519	0.1176	4.16%	0.1363	2.90%
010.03	Moisture, Karl-Fischer (%)	2	2	8.403	0.2086						
010.11	Moisture, NIR (%)	2	2	7.928	0.7531						
011.01	Loss on Drying, HT, 135°C 2hr (%)	58	57	8.961	0.4324	9.026	0.2946	0.0488	3.26%	0.0743	2.87%
011.99	Loss on Drying, HT, High Temp. Methods Miscellaneous (%)	3	3	8.853	0.0301	8.853	0.0301	0.0174	0.34%	0.0593	2.88%
011.02	Loss on Drying, HT, 130°C for 2 hours (%)	2	2	8.948	0.2722						
012.01	Starch, Enzymatic-Colorimetric Method (Megazyme) (%)	12	12	11.76	1.032	11.62	0.7888	0.2846	6.79%	0.3417	2.77%
012.00	Starch, Polarimetric (Ewers) (%)	10	9	13.27	0.6476	13.27	0.7343	0.3060	5.53%	0.1877	2.71%
012.04	Starch, Enzymatic-Enzyme Membrane Technology (YSI) (%)	7	7	12.42	1.652	12.37	1.763	0.8329	14.25%	0.3370	2.74%
012.03	Starch, Enzymatic-Colorimetric Method, Miscellaneous (%)	2	2	306.7	412.6						
012.11	Starch, NIR (%)	1	1	14.01							
012.20	Starch, Dietary, Enzymatic-Colorimetric (%)	1	1	12.10							
012.99	Starch, Miscellaneous (%)	1	1	12.95							
013.00	Fat, Pretreat, Acid hydrolysis (%)	16	16	5.284	0.5534	5.248	0.5374	0.1679	10.24%	0.2163	3.12%
013.02	Fat, Pretreat, Mojonier, Bak Ext, Acid hydrolysis (%)	12	12	5.455	0.6864	5.477	0.6800	0.2454	12.42%	0.1306	3.10%
013.13	Fat, Pretreat, Ankom- Acid Hydrolysis (%)	10	10	5.567	0.8990	5.418	0.6075	0.2401	11.21%	0.2300	3.10%
013.10	Fat, Pretreat, Soxtec-Acid Hydrolysis (%)	6	6	5.019	0.1919	4.976	0.1095	0.0559	2.20%	0.0835	3.14%
015.43	Aluminum, ICP, Microwave (ppm)	7	7	114.1	16.83	114.9	17.27	8.161	15.04%	2.930	7.83%
015.41	Aluminum, ICP, Dry ash (ppm)	4	3	110.3	2.012	110.3	2.012	1.423	1.82%	2.841	7.88%
015.42	Aluminum, ICP, Open vessel (ppm)	2	2	65.77	34.82						
015.53	Aluminum, ICP-MS, Microwave (ppm)	2	2	121.3	3.121						
015.99	Aluminum, Miscellaneous (ppm)	1	1	60.00							
017.43	Boron, ICP, Microwave (ppm)	7	6	8.960	0.7232	9.111	0.4389	0.2240	4.82%	0.5161	11.47%

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017.41	Boron, ICP, Dry ash (ppm)	5	5	9.568	1.097	9.568	1.097	0.4905	11.46%	0.3111	11.39%
017.42	Boron, ICP, Open vessel (ppm)	5	5	8.162	0.7622	8.162	0.7622	0.3409	9.34%	0.2652	11.66%
017.53	Boron, ICP-MS, Microwave (ppm)	1	1	9.004							
017.99	Boron, Miscellaneous (ppm)	1	1	11.67							
019.43	Calcium, ICP, Microwave (%)	29	28	1.018	0.0544	1.013	0.0473	0.0112	4.67%	0.0203	3.99%
019.31	Calcium, AAS, Dry ash (%)	17	17	0.9302	0.2145	0.9803	0.0606	0.0184	6.18%	0.0235	4.01%
019.41	Calcium, ICP, Dry ash (%)	17	17	1.015	0.0580	1.014	0.0649	0.0197	6.40%	0.0186	3.99%
019.42	Calcium, ICP, Open vessel (%)	17	16	1.019	0.0981	1.011	0.0872	0.0272	8.62%	0.0246	3.99%
019.08	Calcium, EDTA (%)	12	12	1.034	0.0498	1.034	0.0564	0.0204	5.46%	0.0217	3.98%
019.99	Calcium, Miscellaneous (%)	8	8	0.9913	0.0477	0.9891	0.0491	0.0217	4.97%	0.0333	4.01%
019.00	Calcium, Ox-Mn04 Vol. (%)	6	6	1.025	0.0743	1.025	0.0825	0.0421	8.05%	0.0157	3.99%
019.52	Calcium, ICP-MS, Open vessel (%)	3	3	0.9882	0.0286	0.9882	0.0286	0.0165	2.90%	0.0225	4.01%
019.53	Calcium, ICP-MS, Microwave (%)	3	3	0.9847	0.0854	0.9847	0.0854	0.0493	8.67%	0.0280	4.01%
019.44	Calcium, ICP, Dry ash (%)	2	2	0.9730	0.0028						
019.09	Calcium, Ion-selective electrode (%)	1	1	1.135							
019.32	Calcium, AAS, Open vessel (%)	1	1	0.9850							
019.51	Calcium, ICP-MS, Dry ash (%)	1	1	1.030							
021.43	Cobalt, ICP, Microwave (ppm)	8	8	1.800	0.3420	1.877	0.1739	0.0769	9.26%	0.0908	14.55%
021.41	Cobalt, ICP, Dry ash (ppm)	5	4	1.612	0.3151	1.612	0.3151	0.1576	19.55%	0.0362	14.89%
021.53	Cobalt, ICP-MS, Microwave (ppm)	4	4	1.686	0.6119	1.686	0.6119	0.3059	36.29%	0.1715	14.79%
021.42	Cobalt, ICP, Open vessel (ppm)	3	3	1.486	0.1421	1.486	0.1421	0.0820	9.56%	0.3610	15.07%
021.52	Cobalt, ICP-MS, Open vessel (ppm)	2	2	1.902	1.199						
021.31	Cobalt, AAS, Dry ash (ppm)	2	1	1.680							
021.99	Cobalt, Miscellaneous (ppm)	1	1	1.670							
022.43	Copper, ICP, Microwave (ppm)	29	29	17.76	1.305	17.74	1.315	0.3052	7.41%	0.8742	10.38%
022.42	Copper, ICP, Open vessel (ppm)	17	16	18.14	1.297	18.14	1.465	0.4578	8.08%	0.3565	10.34%
022.41	Copper, ICP, Dry ash (ppm)	13	12	16.19	1.981	16.22	2.173	0.7840	13.39%	0.3930	10.52%
022.31	Copper, AAS, Dry ash (ppm)	11	9	21.61	10.13	18.70	2.281	0.9504	12.20%	0.8043	10.29%
022.99	Copper, Miscellaneous (ppm)	4	4	16.79	1.563	16.79	1.563	0.7817	9.31%	1.625	10.46%
022.33	Copper, AAS, Microwave (ppm)	3	3	16.79	1.969	16.79	1.969	1.137	11.72%	1.100	10.46%
022.53	Copper, ICP-MS, Microwave (ppm)	3	3	16.65	1.667	16.65	1.667	0.9623	10.01%	1.656	10.48%
022.44	Copper, ICP, Dry ash (ppm)	2	2	18.35	1.623						
022.52	Copper, ICP-MS, Open vessel (ppm)	2	2	19.90	3.675						
022.32	Copper, AAS, Open vessel (ppm)	1	1	13.60							
025.43	Iron, ICP, Microwave (ppm)	26	26	257.7	29.94	261.0	24.08	5.903	9.23%	9.218	6.92%
025.41	Iron, ICP, Dry ash (ppm)	15	15	260.8	17.93	261.3	18.54	5.983	7.10%	5.958	6.92%
025.42	Iron, ICP, Open vessel (ppm)	15	15	247.1	41.91	252.3	32.75	10.57	12.98%	5.405	6.96%
025.31	Iron, AAS, Dry ash (ppm)	11	10	257.4	38.40	257.9	42.55	16.82	16.50%	4.355	6.94%
025.53	Iron, ICP-MS, Microwave (ppm)	3	3	209.8	97.19	209.8	97.19	56.11	46.33%	10.04	7.15%
025.99	Iron, Miscellaneous (ppm)	3	3	255.3	7.974	255.3	7.974	5.638	3.12%	10.00	6.95%

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025.33	Iron, AAS, Microwave (ppm)	2	2	254.6	2.174						
025.52	Iron, ICP-MS, Open vessel (ppm)	2	2	235.1	27.26						
027.43	Magnesium, ICP, Microwave (%)	25	24	0.3069	0.0155	0.3071	0.0160	0.0041	5.22%	0.0119	4.78%
027.42	Magnesium, ICP, Open vessel (%)	17	16	0.3122	0.0202	0.3111	0.0200	0.0063	6.44%	0.0082	4.77%
027.41	Magnesium, ICP, Dry ash (%)	13	12	0.3037	0.0138	0.3043	0.0141	0.0051	4.65%	0.0053	4.78%
027.99	Magnesium, Miscellaneous (%)	5	4	0.3000	0.0041	0.3000	0.0041	0.0020	1.36%	0.0100	4.79%
027.31	Magnesium, AAS, Dry ash (%)	4	3	0.3156	0.0098	0.3156	0.0098	0.0069	3.09%	0.0014	4.76%
027.33	Magnesium, AAS, Microwave (%)	3	3	0.3038	0.0218	0.3038	0.0218	0.0126	7.17%	0.0070	4.79%
027.52	Magnesium, ICP-MS, Open vessel (%)	3	3	0.3446	0.0697	0.3446	0.0697	0.0493	20.24%	0.0198	4.70%
027.53	Magnesium, ICP-MS, Microwave (%)	3	3	0.2960	0.0285	0.2960	0.0285	0.0164	9.62%	0.0342	4.80%
027.44	Magnesium, ICP, Dry ash (%)	1	1	0.3000							
028.43	Manganese, ICP, Microwave (ppm)	27	27	102.2	5.594	102.1	6.013	1.446	5.89%	2.535	7.97%
028.42	Manganese, ICP, Open vessel (ppm)	18	17	106.5	9.814	106.0	9.998	3.031	9.43%	1.891	7.93%
028.41	Manganese, ICP, Dry ash (ppm)	13	13	100.4	6.092	101.6	3.315	1.149	3.26%	2.265	7.98%
028.31	Manganese, AAS, Dry ash (ppm)	9	9	107.1	24.08	103.1	10.17	4.237	9.87%	1.546	7.96%
028.53	Manganese, ICP-MS, Microwave (ppm)	4	4	103.7	5.833	103.7	5.833	2.917	5.63%	3.224	7.96%
028.99	Manganese, Miscellaneous (ppm)	4	4	99.20	1.662	99.20	1.662	0.8309	1.68%	3.000	8.01%
028.33	Manganese, AAS, Microwave (ppm)	2	2	101.1	3.189						
028.44	Manganese, ICP, Dry ash (ppm)	2	2	89.82	12.28						
028.52	Manganese, ICP-MS, Open vessel (ppm)	2	2	124.1	29.13						
028.32	Manganese, AAS, Open vessel (ppm)	1	1	108.0							
030.01	Nitrate, Ion-selective electrode (%)	1	1	0.0045							
031.01	Phosphorus, Photometric (%)	32	31	0.6332	0.0334	0.6338	0.0279	0.0063	4.40%	0.0133	4.28%
031.43	Phosphorus, ICP, Microwave (%)	31	30	0.6437	0.0332	0.6437	0.0376	0.0086	5.84%	0.0142	4.27%
031.42	Phosphorus, ICP, Open vessel (%)	18	18	0.6483	0.0438	0.6447	0.0392	0.0115	6.08%	0.0197	4.27%
031.41	Phosphorus, ICP, Dry ash (%)	15	14	0.6323	0.0224	0.6323	0.0254	0.0085	4.01%	0.0090	4.29%
031.99	Phosphorus, Miscellaneous (%)	6	6	0.6017	0.0670	0.6000	0.0582	0.0297	9.70%	0.0200	4.32%
031.44	Phosphorus, ICP, Dry ash (%)	4	4	0.6309	0.0405	0.6309	0.0405	0.0202	6.41%	0.0081	4.29%
031.53	Phosphorus, ICP-MS, Microwave (%)	3	3	0.6272	0.0587	0.6272	0.0587	0.0339	9.36%	0.0324	4.29%
031.03	Phosphorus, Autoanalyzer (%)	2	2	0.6317	0.0377						
031.52	Phosphorus, ICP-MS, Open vessel (%)	2	2	0.6542	0.0053						
031.06	Phosphorus, Hach Method (%)	1	1	0.4950							
031.51	Phosphorus, ICP-MS, Dry ash (%)	1	1	0.6350							
032.43	Potassium, ICP, Microwave (%)	29	28	1.054	0.1141	1.068	0.0637	0.0150	5.96%	0.0262	3.96%
032.42	Potassium, ICP, Open vessel (%)	17	17	1.091	0.0804	1.090	0.0690	0.0209	6.33%	0.0240	3.95%
032.41	Potassium, ICP, Dry ash (%)	15	14	1.061	0.0476	1.063	0.0496	0.0166	4.67%	0.0175	3.96%
032.31	Potassium, AAS, Dry ash (%)	9	8	1.016	0.1001	1.028	0.0822	0.0363	8.00%	0.0065	3.98%
032.99	Potassium, Miscellaneous (%)	6	6	1.060	0.0497	1.060	0.0564	0.0288	5.32%	0.0164	3.96%
032.52	Potassium, ICP-MS, Open vessel (%)	3	3	1.045	0.0485	1.045	0.0485	0.0280	4.64%	0.0369	3.97%
032.53	Potassium, ICP-MS, Microwave (%)	3	3	1.060	0.0566	1.060	0.0566	0.0401	5.34%	0.0388	3.96%

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032.33	Potassium, AAS, Microwave (%)	2	2	1.072	0.0187						
032.08	Potassium, Ion-selective electrode (%)	1	1	0.8850							
032.32	Potassium, AAS, Open vessel (%)	1	1	1.130							
032.44	Potassium, ICP, Dry ash (%)	1	1	1.075							
033.01	Salt as chloride, Poten Cl (%)	26	25	0.4187	0.0653	0.4034	0.0202	0.0050	5.00%	0.0141	4.59%
033.00	Salt as chloride, Sol Cl (%)	17	16	0.3985	0.0943	0.3934	0.0770	0.0241	19.59%	0.0147	4.60%
033.99	Salt, Miscellaneous (%)	9	9	0.6265	0.2346	0.6265	0.2660	0.1108	42.46%	0.0201	4.29%
033.03	Salt as chloride, Quantab (%)	4	4	0.3700	0.0990	0.3700	0.0990	0.0495	26.75%	0.0333	4.65%
033.05	Salt as chloride, Ion Sel Electrode (%)	4	3	0.3917	0.0325	0.3917	0.0325	0.0188	8.31%	0.0150	4.61%
034.53	Selenium, Total (Se), ICP-MS, Microwave (ppm)	7	7	0.3762	0.0590	0.3762	0.0669	0.0316	17.77%	0.0239	18.53%
034.04	Selenium, Total (Se), AA, Hydride (ppm)	3	3	0.3268	0.0199	0.3268	0.0199	0.0115	6.10%	0.0285	18.93%
034.43	Selenium, Total (Se), ICP, Microwave (ppm)	4	2	0.3340	0.0778	0.3340	0.0778			0.0220	18.87%
034.01	Selenium, Total (Se), Fluor (ppm)	1	1	0.3970							
034.41	Selenium, Total (Se), ICP, Dry ash (ppm)	1	1	0.2485							
034.52	Selenium, Total (Se), ICP-MS, Open vessel (ppm)	1	1	0.3460							
034.99	Selenium, Total (Se), Miscellaneous (ppm)	1	1	0.7565							
035.43	Sodium, ICP, Microwave (%)	27	26	0.3503	0.0206	0.3501	0.0182	0.0045	5.21%	0.0103	4.68%
035.41	Sodium, ICP, Dry ash (%)	15	15	0.3499	0.0140	0.3492	0.0143	0.0046	4.10%	0.0070	4.69%
035.42	Sodium, ICP, Open vessel (%)	16	15	0.3456	0.0305	0.3472	0.0305	0.0098	8.78%	0.0112	4.69%
035.31	Sodium, AAS, Dry ash (%)	11	11	0.3364	0.0189	0.3398	0.0112	0.0042	3.31%	0.0075	4.71%
035.99	Sodium, Miscellaneous (%)	5	4	0.3363	0.0138	0.3363	0.0138	0.0069	4.10%	0.0150	4.71%
035.53	Sodium, ICP-MS, Microwave (%)	3	3	0.3438	0.0137	0.3438	0.0137	0.0079	3.98%	0.0202	4.70%
035.01	Sodium, Ion-selective electrode (%)	2	2	0.3950	0.0354						
035.52	Sodium, ICP-MS, Open vessel (%)	2	2	0.3455	0.0251						
035.32	Sodium, AAS, Open vessel (%)	1	1	0.3450							
035.33	Sodium, AAS, Microwave (%)	1	1	0.3500							
036.43	Sulfur, ICP, Microwave (%)	21	20	0.5637	0.0462	0.5666	0.0390	0.0109	6.89%	0.0127	4.36%
036.42	Sulfur, ICP, Open vessel (%)	16	16	0.5481	0.0395	0.5481	0.0441	0.0138	8.04%	0.0122	4.38%
036.04	Sulfur, LECO (%)	5	5	0.5710	0.0581	0.5710	0.0581	0.0260	10.17%	0.0162	4.35%
036.99	Sulfur, Miscellaneous (%)	3	3	0.5200	0.0726	0.5200	0.0726	0.0419	13.97%	0.0133	4.41%
036.52	Sulfur, ICP-MS, Open vessel (%)	1	1	0.5614							
037.43	Zinc, ICP, Microwave (ppm)	30	30	117.9	7.570	117.8	7.729	1.764	6.56%	3.326	7.80%
037.42	Zinc, ICP, Open vessel (ppm)	17	17	119.0	10.82	118.9	10.86	3.291	9.13%	4.792	7.79%
037.41	Zinc, ICP, Dry ash (ppm)	13	12	118.2	5.727	118.2	6.495	2.344	5.50%	2.594	7.80%
037.31	Zinc, AAS, Dry ash (ppm)	10	10	120.5	19.00	117.7	7.771	3.072	6.60%	2.368	7.81%
037.99	Zinc, Miscellaneous (ppm)	5	5	113.6	6.305	113.6	6.305	2.820	5.55%	3.030	7.85%
037.33	Zinc, AAS, Microwave (ppm)	3	3	131.0	18.18	131.0	18.18	12.85	13.87%	13.44	7.68%
037.44	Zinc, ICP, Dry ash (ppm)	3	3	103.6	16.24	103.6	16.24	9.376	15.68%	6.587	7.96%
037.53	Zinc, ICP-MS, Microwave (ppm)	3	3	114.0	2.687	114.0	2.687	1.551	2.36%	8.760	7.84%
037.52	Zinc, ICP-MS, Open vessel (ppm)	2	2	130.6	25.63						

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037.32	Zinc, AAS, Open vessel (ppm)	1	1	132.5							
037.34	Zinc, AAS, Dry ash (ppm)	1	1	116.4							
038.43	Molybdenum, ICP, Microwave (ppm)	9	9	2.034	0.6006	2.132	0.4202	0.1751	19.71%	0.1721	14.27%
038.41	Molybdenum, ICP, Dry ash (ppm)	4	4	2.460	0.2530	2.460	0.2530	0.1265	10.29%	0.0606	13.97%
038.42	Molybdenum, ICP, Open vessel (ppm)	4	4	2.160	0.3107	2.160	0.3107	0.1553	14.38%	0.1803	14.25%
038.53	Molybdenum, ICP-MS, Microwave (ppm)	4	4	2.249	0.0701	2.249	0.0701	0.0350	3.12%	0.0828	14.16%
038.52	Molybdenum, ICP-MS, Open vessel (ppm)	1	1	1.862							
038.99	Molybdenum, Miscellaneous (ppm)	1	1	2.330							
040.53	Barium, ICP-MS, Microwave (ppm)	1	1	14.38							
041.53	Vanadium, ICP-MS, Microwave (ppm)	1	1	0.3767							
042.00	Chloride, Titrimetric (%)	5	5	0.3130	0.0964	0.3130	0.0964	0.0431	30.78%	0.0125	4.76%
042.99	Chloride, Miscellaneous (%)	3	3	0.3653	0.1384	0.3653	0.1384	0.0799	37.89%	0.0300	4.65%
042.01	Chloride, Ion-selective electrode (%)	1	1	0.2600							
101.99	Choline Chloride, Miscellaneous (ppm)	1	1	1,030							
102.01	Niacin, Microbiological (ppm)	1	1	66.95							
102.02	Niacin, LC (ppm)	1	1	12.90							
103.01	Pantothenic Acid, Microbiological (ppm)	1	1	8.735							
104.00	Riboflavin, Fluorometric (ppm)	1	1	1.890							
104.03	Riboflavin, LC (ppm)	1	1	1.670							
105.00	Thiamine, LC (ppm)	2	2	10.39	10.97						
105.01	Thiamine, Fluorometer (ppm)	1	1	5.130							
106.02	Vitamin A, LC (KU / kg)	12	11	21.76	4.092	21.19	3.097	1.167	14.61%	1.976	
106.00	Vitamin A, Color (KU / kg)	1	1	20.80							
106.01	Vitamin A, UV (KU / kg)	1	1	25.75							
107.00	Vitamin B12, Microbiological (ppb)	1	1	6.020							
108.02	Vitamin D3, LC (KU / kg)	3	3	5.562	0.4769	5.562	0.4769	0.2753	8.57%	1.389	
108.99	Vitamin D3, Miscellaneous (KU / kg)	1	1	4.585							
109.02	Vitamin E, LC (IU / kg)	10	10	115.4	23.69	116.3	19.51	7.712	16.77%	5.940	
109.99	Vitamin E, Miscellaneous (IU / kg)	1	1	110.5							
111.00	Vitamin C, Phosphorylated, LC (ppm)	1	1	4.400							
112.01	Pyridoxine, LC (µg / g)	2	2	3.773	0.8379						
113.01	Folic Acid, Micro (ppm)	1	1	1.515							
113.02	Folic acid, LC (ppm)	1	1	0.1500							
114.01	Biotin, Microbiological (ppm)	1	1	0.3810							
115.00	Non Protein N (NPN), Urea + Am, Urease method (%)	2	2	0.3150	0.3323						
115.99	Non Protein N (NPN), Miscellaneous (%)	1	1	0.5220							
120.00	Alanine, Post-col Ninhydrin Der (%)	12	12	0.9613	0.0698	0.9485	0.0339	0.0122	3.57%	0.0114	4.03%
120.05	Alanine, Pre-col AQC Der (%)	10	10	0.9044	0.1051	0.9136	0.0964	0.0381	10.55%	0.0237	4.05%
120.99	Alanine, Miscellaneous (%)	4	4	0.9423	0.0697	0.9423	0.0697	0.0349	7.40%	0.0115	4.04%
120.02	Alanine, Post-col OPA Der (%)	1	1	0.9570							

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121.00	Arginine, Post-col Ninhydrin Der (%)	12	12	1.124	0.1802	1.168	0.0504	0.0182	4.31%	0.0180	3.91%
121.05	Arginine, Pre-col AQC Der (%)	10	10	1.154	0.1456	1.161	0.1494	0.0591	12.87%	0.0262	3.91%
121.99	Arginine, Miscellaneous (%)	4	4	1.134	0.0952	1.134	0.0952	0.0476	8.39%	0.0290	3.92%
121.02	Arginine, Post-col OPA Der (%)	1	1	1.180							
122.00	Aspartic, Post-col Ninhydrin Der (%)	12	12	1.441	0.0616	1.444	0.0627	0.0226	4.34%	0.0222	3.78%
122.05	Aspartic, Pre-col AQC Der (%)	10	10	1.396	0.1303	1.400	0.1378	0.0545	9.84%	0.0344	3.80%
122.99	Aspartic, Miscellaneous (%)	4	3	1.519	0.0052	1.519	0.0052	0.0030	0.34%	0.0157	3.76%
122.02	Aspartic, Post-col OPA Der (%)	1	1	1.516							
124.00	Cysteine/Cystine, PAO Post-col Ninhydrin Der (%)	12	11	0.3386	0.0501	0.3405	0.0296	0.0111	8.68%	0.0100	4.70%
124.05	Cysteine/Cystine, PAO Pre-col AQC Der (%)	10	10	0.3381	0.0490	0.3381	0.0556	0.0220	16.45%	0.0166	4.71%
124.99	Cysteine/Cystine, Miscellaneous (%)	5	5	0.3008	0.0284	0.3008	0.0284	0.0127	9.44%	0.0158	4.79%
124.02	Cysteine/Cystine, PAO Post-col OPA Der (%)	1	1	0.3640							
125.00	Glutamic, Post-col Ninhydrin Der (%)	12	12	3.100	0.2432	3.139	0.1621	0.0585	5.16%	0.0364	3.37%
125.05	Glutamic, Pre-col AQC Der (%)	10	10	3.117	0.3796	3.082	0.3446	0.1362	11.18%	0.0598	3.38%
125.99	Glutamic, Miscellaneous (%)	4	4	3.197	0.2622	3.197	0.2622	0.1311	8.20%	0.0238	3.36%
125.02	Glutamic, Post-col OPA Der (%)	1	1	3.258							
126.00	Glycine, Post-col Ninhydrin Der (%)	12	12	0.8829	0.0813	0.8683	0.0314	0.0113	3.62%	0.0149	4.09%
126.05	Glycine, Pre-col AQC Der (%)	10	10	0.8558	0.1249	0.8625	0.1257	0.0497	14.58%	0.0193	4.09%
126.99	Glycine, Miscellaneous (%)	4	3	0.7157	0.2838	0.7157	0.2838	0.2007	39.65%	0.0060	4.21%
126.02	Glycine, Post-col OPA Der (%)	1	1	0.8990							
127.00	Histidine, Post-col Ninhydrin Der (%)	12	12	0.4763	0.0536	0.4826	0.0271	0.0098	5.62%	0.0086	4.46%
127.05	Histidine, Pre-col AQC Der (%)	10	10	0.4495	0.0625	0.4452	0.0606	0.0240	13.62%	0.0155	4.52%
127.99	Histidine, Miscellaneous (%)	4	3	0.4433	0.0551	0.4433	0.0551			0.0000	4.52%
127.02	Histidine, Post-col OPA Der (%)	1	1	0.4700							
128.00	Isoleucine, Post-col Ninhydrin Der (%)	12	12	0.6294	0.0391	0.6280	0.0376	0.0136	5.99%	0.0131	4.29%
128.05	Isoleucine, Pre-col AQC Der (%)	10	10	0.6203	0.0800	0.6203	0.0907	0.0359	14.63%	0.0172	4.30%
128.99	Isoleucine, Miscellaneous (%)	4	4	0.6400	0.0610	0.6400	0.0610	0.0305	9.53%	0.0093	4.28%
128.02	Isoleucine, Post-col OPA Der (%)	1	1	0.6390							
129.00	Leucine, Post-col Ninhydrin Der (%)	12	12	1.416	0.0505	1.417	0.0543	0.0196	3.83%	0.0142	3.80%
129.05	Leucine, Pre-col AQC Der (%)	10	10	1.357	0.1413	1.357	0.1602	0.0633	11.80%	0.0301	3.82%
129.99	Leucine, Miscellaneous (%)	4	3	1.328	0.1458	1.328	0.1458	0.1031	10.98%	0.0040	3.83%
129.02	Leucine, Post-col OPA Der (%)	1	1	1.415							
130.00	L-Lysine, Post-col Ninhydrin Der (%)	13	13	0.8215	0.0361	0.8194	0.0360	0.0125	4.40%	0.0194	4.12%
130.05	L-Lysine, Pre-col AQC Der (%)	10	10	0.7625	0.0822	0.7672	0.0823	0.0325	10.73%	0.0269	4.16%
130.99	L-Lysine, Miscellaneous (%)	5	5	0.8065	0.0927	0.8065	0.0927	0.0415	11.50%	0.0640	4.13%
130.02	L-Lysine, Post-col OPA Der (%)	1	1	0.8920							
131.00	Methionine, PAO Post-col Ninhydrin Der (%)	12	11	0.2966	0.0435	0.2853	0.0117	0.0044	4.09%	0.0119	4.83%
131.05	Methionine, PAO Pre-col AQC Der (%)	10	10	0.3065	0.0514	0.3054	0.0559	0.0221	18.29%	0.0143	4.78%
131.99	Methionine, Miscellaneous (%)	5	5	0.2823	0.0591	0.2823	0.0591	0.0264	20.93%	0.0117	4.84%
131.02	Methionine, PAO Post-col OPA Der (%)	1	1	0.2870							

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132.00	Phenylalanine, Post-col Ninhydrin Der (%)	12	12	0.8107	0.0448	0.8187	0.0297	0.0107	3.63%	0.0179	4.12%
132.05	Phenylalanine, Pre-col AQC Der (%)	10	10	0.8041	0.1048	0.8041	0.1188	0.0470	14.77%	0.0212	4.13%
132.99	Phenylalanine, Miscellaneous (%)	4	4	0.8071	0.0600	0.8071	0.0600	0.0300	7.43%	0.0055	4.13%
132.02	Phenylalanine, Post-col OPA Der (%)	1	1	0.8205							
133.00	Proline, Post-col Ninhydrin Der (%)	12	12	1.112	0.1019	1.100	0.0829	0.0299	7.53%	0.0152	3.94%
133.05	Proline, Pre-col AQC Der (%)	10	10	1.071	0.1123	1.088	0.0863	0.0341	7.93%	0.0233	3.95%
133.99	Proline, Miscellaneous (%)	4	4	1.125	0.0372	1.125	0.0372	0.0186	3.30%	0.0290	3.93%
134.00	Serine, Post-col Ninhydrin Der (%)	12	12	0.8206	0.0727	0.8318	0.0548	0.0198	6.59%	0.0140	4.11%
134.05	Serine, Pre-col AQC Der (%)	10	10	0.8229	0.1393	0.8289	0.1441	0.0570	17.39%	0.0205	4.11%
134.99	Serine, Miscellaneous (%)	4	3	0.8367	0.0104	0.8367	0.0104	0.0060	1.24%	0.0107	4.11%
134.02	Serine, Post-col OPA Der (%)	1	1	0.7550							
135.00	Threonine, Post-col Ninhydrin Der (%)	12	12	0.6233	0.0292	0.6250	0.0291	0.0105	4.65%	0.0145	4.29%
135.05	Threonine, Pre-col AQC Der (%)	10	10	0.6159	0.1033	0.6167	0.1153	0.0456	18.70%	0.0182	4.30%
135.99	Threonine, Miscellaneous (%)	5	4	0.6550	0.0230	0.6550	0.0230	0.0115	3.51%	0.0080	4.26%
135.02	Threonine, Post-col OPA Der (%)	1	1	0.6310							
136.03	Tryptophan, Alka-Hydrol + IS RP LC FI (%)	8	7	0.2377	0.0083	0.2377	0.0094	0.0045	3.97%	0.0021	4.97%
136.05	Tryptophan, Pre-col AQC Der (%)	4	4	0.2299	0.0213	0.2299	0.0213	0.0107	9.28%	0.0170	4.99%
136.00	Tryptophan, Alka-Hydrol Post-col Ninhyd (%)	3	3	0.2577	0.0610	0.2577	0.0610	0.0432	23.69%	0.0100	4.91%
136.99	Tryptophan, Miscellaneous (%)	3	3	0.2810	0.1611	0.2810	0.1611	0.0930	57.33%	0.0140	4.84%
136.02	Tryptophan, Alka-Hydrol Post-col OPA De (%)	1	1	0.2380							
137.05	Tyrosine, Pre-col AQC Der (%)	10	10	0.5769	0.0841	0.5773	0.0945	0.0374	16.37%	0.0242	4.34%
137.00	Tyrosine, Post-col Ninhydrin Der (%)	10	9	0.5871	0.0401	0.5871	0.0455	0.0190	7.75%	0.0100	4.33%
137.99	Tyrosine, Miscellaneous (%)	4	4	0.5443	0.0551	0.5443	0.0551	0.0276	10.13%	0.0107	4.38%
137.02	Tyrosine, Post-col OPA Der (%)	1	1	0.5275							
138.00	Valine, Post-col Ninhydrin Der (%)	12	12	0.8244	0.0377	0.8258	0.0395	0.0142	4.78%	0.0199	4.12%
138.05	Valine, Pre-col AQC Der (%)	10	10	0.8056	0.0742	0.8132	0.0651	0.0257	8.00%	0.0229	4.13%
138.99	Valine, Miscellaneous (%)	4	4	0.8323	0.0893	0.8323	0.0893	0.0447	10.73%	0.0080	4.11%
138.02	Valine, Post-col OPA Der (%)	1	1	0.8945							
139.00	Taurine, Post-col Ninhydrin Der (%)	2	2	0.1160	0.1047						
139.05	Taurine, Pre-col AQC Der (%)	1	1	0.0065							
139.99	Taurine, Miscellaneous (%)	2	1	0.0300							
139.02	Taurine, Post-col OPA Der (%)	1	1	0.0100							
160.99	Fructose, Miscellaneous (%)	2	2	0.3610	0.0297						
160.10	Fructose, HPAEC PAD (%)	1	1	0.1600							
161.10	Galactose, HPAEC PAD (%)	1	1	0.0000							
162.99	Glucose, Miscellaneous (%)	2	2	2.863	3.094						
162.10	Glucose, HPAEC PAD (%)	1	1	0.1500							
163.10	Lactose, HPAEC PAD (%)	1	1	0.0000							
163.99	Lactose, Miscellaneous (%)	1	1	0.1500							
164.10	Maltose, HPAEC PAD (%)	1	1	0.2550							



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164.99	Maltose, Miscellaneous (%)	1	1	0.3150							
165.99	Sucrose, Miscellaneous (%)	2	2	1.810	0.0566						
165.10	Sucrose, HPAEC PAD (%)	1	1	1.925							
166.10	Raffinose, HPAEC PAD (%)	1	1	0.8500							
166.99	Raffinose, Miscellaneous (%)	1	1	0.5750							
167.10	Stachyose, HPAEC PAD (%)	1	1	1.040							
167.99	Stachyose, Miscellaneous (%)	1	1	0.3100							
345.02	Amprolium, LC (UV or FL) (ppm)	9	9	141.4	7.958	141.9	7.778	3.241	5.48%	3.573	7.59%
345.00	Amprolium, Colorimetric (ppm)	5	5	144.8	24.12	144.8	24.12	10.79	16.65%	10.91	7.57%
345.04	Amprolium, LC-MS/MS (ppm)	2	2	95.93	114.1						
354.04	Decoquinatate, LC-MS/MS (ppm)	1		0.2500							
361.05	Lasalocid Sodium, LC-MS/MS (ppm)	1		0.2500							
365.05	Monensin, LC-MS/MS (ppm)	9	9	32.82	6.019	31.89	3.703	1.543	11.61%	1.160	9.50%
365.03	Monensin, LC-PCD (ppm)	7	6	33.80	3.853	33.80	4.370	2.230	12.93%	0.8965	9.42%
365.02	Monensin, LC (ppm)	3	3	34.17	1.424	34.17	1.424	1.007	4.17%	1.690	9.40%
365.04	Monensin, LC-MS (ppm)	2	2	33.63	4.773						
365.99	Monensin, Miscellaneous (ppm)	2	2	35.73	3.080						
365.00	Monensin, Plate (ppm)	1	1	33.07							
379.05	Salinomycin, LC-MS/MS (ppm)	1		0.0250							
391.03	Narasin, LC-MS/MS (ppm)	1		0.2500							
400.01	Water Activity, Aqualab chilled mirror (Units)	14	14	0.4635	0.0414	0.4559	0.0284	0.0095	6.24%	0.0041	
516.53	Arsenic, Total (As), ICP-MS, Microwave (ppm)	3	2	0.0527	0.0168	0.0527	0.0168			0.0061	22.00%
516.00	Arsenic, Total (As), AA, Hydride (ppm)	1	1	0.0450							
516.52	Arsenic, Total (As), ICP-MS, Open vessel (ppm)	1	1	0.0559							
516.43	Arsenic, Total (As), ICP, Microwave (ppm)	2		1.420							
518.53	Cadmium, ICP-MS, Microwave (ppm)	3	3	0.1181	0.0138	0.1181	0.0138	0.0080	11.72%	0.0120	22.00%
518.43	Cadmium, ICP, Microwave (ppm)	4	2	0.1288	0.0074	0.1288	0.0074			0.0078	21.78%
518.41	Cadmium, ICP, Dry ash (ppm)	1	1	0.1026							
518.42	Cadmium, ICP, Open vessel (ppm)	1	1	0.1800							
518.52	Cadmium, ICP-MS, Open vessel (ppm)	1	1	0.1288							
518.99	Cadmium, Miscellaneous (ppm)	1	1	0.1469							
520.43	Chromium, Total (Cr), ICP, Microwave (ppm)	6	5	6.198	0.6421	6.198	0.6421	0.3590	10.36%	0.0461	12.16%
520.53	Chromium, Total (Cr), ICP-MS, Microwave (ppm)	4	4	5.319	2.622	5.319	2.622	1.311	49.29%	0.2203	12.44%
520.42	Chromium, Total (Cr), ICP, Open vessel (ppm)	2	2	6.156	0.6417						
520.41	Chromium, Total (Cr), ICP, Dry ash (ppm)	1	1	4.038							
520.52	Chromium, Total (Cr), ICP-MS, Open vessel (ppm)	1	1	2.140							
526.53	Lead, ICP-MS, Microwave (ppm)	4	4	0.1163	0.0160	0.1163	0.0160	0.0080	13.77%	0.0058	22.00%
526.41	Lead, ICP, Dry ash (ppm)	1	1	0.1575							
526.43	Lead, ICP, Microwave (ppm)	3	1								
526.52	Lead, ICP-MS, Open vessel (ppm)	1	1	0.1132							

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
529.99	Mercury, Miscellaneous (ppb)	4	1								
539.43	Nickel, ICP, Microwave (ppm)	3	3	3.927	0.3847	3.927	0.3847	0.2720	9.80%	0.0872	13.02%
539.53	Nickel, ICP-MS, Microwave (ppm)	2	2	3.609	0.1192						
539.41	Nickel, ICP, Dry ash (ppm)	1	1	3.440							
539.52	Nickel, ICP-MS, Open vessel (ppm)	1	1	1.759							
710.99	Lauric Acid (12:0), Miscellaneous (% (w/w))	2		0.0000							
714.99	Myristic Acid (14:0 ), Miscellaneous (% (w/w))	1	1	0.0110							
716.99	Palmitic Acid (16:0), Miscellaneous (% (w/w))	2	2	0.5737	0.2810						
718.99	Palmitoleic Acid (9c-16:1), Miscellaneous (% (w/w))	2	2	0.0119	0.0005						
722.99	Stearic Acid (18:0), Miscellaneous (% (w/w))	2	2	0.0841	0.0270						
724.99	Oleic Acid (9c-18:1), Miscellaneous (% (w/w))	2	2	0.6380	0.3507						
726.99	Linoleic Acid (9c,12c-18:2), Miscellaneous (% (w/w))	3	3	1.993	0.9549	1.993	0.9549	0.5513	47.91%	0.0233	3.61%
728.99	alpha-Linolenic Acid (9c,12c,15c-18:3), Miscellaneous (% (w/w))	3	3	0.1323	0.0415	0.1323	0.0415	0.0240	31.41%	0.0042	5.42%
730.99	Arachidic Acid (20:0), Miscellaneous (% (w/w))	1	1	0.0143							
732.99	Gondoic Acid (11c-20:1), Miscellaneous (% (w/w))	1	1	0.0200							
736.99	Arachidonic Acid (5c,8c,11c,14c-20:4), Miscellaneous (% (w/w))	1		0.0000							
740.99	Eicosapentaenoic Acid EPA (5c,8c,11c,14c,17c-20:5), Miscellaneous (% (w/w))	2		0.0000							
742.99	Behenic Acid (22:0), Miscellaneous (% (w/w))	1	1	0.0108							
744.99	Erucic Acid (13c-22:1), Miscellaneous (% (w/w))	1		0.0050							
746.99	Docosapentaenoic Acid n-3 DPA (7c,10c,13c,16c,19c-22:5), Miscellaneous (% (w/w))	2		0.0000							
748.99	Lignoceric Acid (24:0), Miscellaneous (% (w/w))	1	1	0.0132							
750.99	Docosahexaenoic Acid DHA (4c,7c,10c,13c,16c,19c-22:6), Miscellaneous (% (w/w))	2		0.0000							
752.99	Nervonic Acid (24:1) isomers, Miscellaneous (% (w/w))	1		0.0050							
754.99	Total n-3 Polyunsaturated (Omega-3) Fatty Acids, Miscellaneous (% (w/w))	2	2	0.1240	0.0552						
756.99	Total n-6 Polyunsaturated (Omega-6) Fatty Acids, Miscellaneous (% (w/w))	2	2	1.765	1.230						
758.99	Total Saturated Fatty Acids, Miscellaneous (% (w/w))	1	1	0.4400							
762.99	Total Monounsaturated Fatty Acids, Miscellaneous (% (w/w))	1	1	0.4100							
766.99	Total Polyunsaturated Fatty Acids, Miscellaneous (% (w/w))	1	1	0.9750							
772.99	Total Fatty Acids, Miscellaneous (% (w/w))	2	2	3.138	1.856						

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.



**Animal Feed Scheme**

**Beef Starter, Medicated**

**Test Material Code # 202323**

**# Methods Reported: 133**

**# Labs Reporting: 160**

**Issue Date : 04/30/2023**

**Method Precision Report**

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
001.00	Loss on Drying, Vac 95°C 5 hr (%)	5	5	8.406	0.1616	0.1511	0.0811	0.1715	1.80%	0.96%	2.04%	2.115
001.07	Loss on Drying, 104°C 3 hr, in malt (%)	46	40	8.328	0.3190	0.2187	0.1049	0.2425	2.61%	1.25%	2.90%	2.313
001.99	Loss on Drying, Miscellaneous (%)	16	15	8.021	0.5673	0.5625	0.1033	0.5719	7.01%	1.29%	7.13%	5.537
002.01	Protein, Crude, Auto Kjel-Foss (%)	21	18	18.64	0.2556	0.2134	0.0637	0.2227	1.15%	0.34%	1.20%	3.498
002.05	Protein, Crude, Copper, Boric Acid (%)	24	22	18.67	0.3469	0.2310	0.1360	0.2681	1.24%	0.73%	1.44%	1.971
002.06	Protein, Crude, Combustion Nitrogen Analyzer (%)	109	102	18.90	0.2945	0.2409	0.1478	0.2826	1.27%	0.78%	1.49%	1.913
003.00	Fat, Crude, Diethyl Ether Ext., Direct (%)	12	11	4.517	0.6281	0.1478	0.0932	0.1747	3.40%	2.15%	4.02%	1.875
003.06	Fat, Crude, Pet Ether (%)	16	15	4.236	0.2521	0.2378	0.1242	0.2683	5.63%	2.94%	6.36%	2.160
003.09	Fat, Crude, Randall, Diethyl Ether Ext (%)	9	7	4.128	0.3659	0.0901	0.0514	0.1038	2.12%	1.21%	2.44%	2.018
003.10	Fat, Crude, Randall, Pet Ether (%)	28	25	4.064	0.2977	0.2070	0.0637	0.2165	5.03%	1.55%	5.27%	3.399
003.13	Fat, Crude, Randall, Hexane Ext. (%)	5	5	3.975	0.4470	0.4316	0.1643	0.4618	10.86%	4.13%	11.62%	2.811
003.14	Fat, Crude, Ankom (%)	49	47	4.134	0.3503	0.2398	0.1302	0.2729	5.74%	3.11%	6.53%	2.096
004.00	Fiber, Crude, Asbestos Free (%)	10	8	14.48	0.8953	0.3891	0.1085	0.4040	2.74%	0.76%	2.85%	3.722
004.06	Fiber, Crude, Fibertec (%)	21	19	13.83	0.9026	0.6993	0.2273	0.7353	5.00%	1.62%	5.26%	3.235
004.07	Fiber, Crude, ANKOM (%)	71	64	14.09	1.095	0.8154	0.2051	0.8408	5.84%	1.47%	6.02%	4.100
005.00	Ash, 2h @ 600°C (%)	86	80	6.597	0.2130	0.1821	0.0569	0.1908	2.76%	0.86%	2.89%	3.350
005.05	Ash, 3h @ 550°C (%)	23	22	6.855	0.1861	0.1835	0.0441	0.1887	2.68%	0.64%	2.75%	4.276
005.99	Ash, Miscellaneous (%)	8	8	6.812	0.2977	0.2955	0.0504	0.2998	4.34%	0.74%	4.40%	5.946
006.99	Total Sugars, Miscellaneous (%)	6	6	4.157	1.541	1.540	0.0647	1.541	37.05%	1.56%	37.08%	23.83
008.02	Fiber, Acid Detergent, Crucible (%)	13	12	19.13	1.103	0.7891	0.1746	0.8082	4.08%	0.90%	4.18%	4.628
008.08	Fiber, Acid Detergent, Filter Bag - ANKOM (%)	45	41	19.16	1.374	1.196	0.2844	1.229	6.20%	1.48%	6.38%	4.322
009.07	Fiber, Neutral Detergent, AOAC -ENZ Pretreat (%)	12	11	36.74	0.6050	0.1612	0.5753	0.5974	0.44%	1.56%	1.62%	1.039
009.09	Fiber, Neutral Detergent, Filter Bag - ANKOM (%)	43	39	35.66	1.296	1.240	0.4370	1.315	3.48%	1.22%	3.68%	3.008
010.99	Moisture, Miscellaneous (%)	14	14	8.452	0.3103	0.2999	0.1128	0.3204	3.55%	1.33%	3.79%	2.840
011.01	Loss on Drying, HT, 135°C 2hr (%)	58	51	8.961	0.4324	0.2774	0.0561	0.2830	3.07%	0.62%	3.13%	5.045
012.00	Starch, Polarimetric (Ewers) (%)	10	9	13.27	0.6476	0.6395	0.1442	0.6555	4.82%	1.09%	4.94%	4.545
012.01	Starch, Enzymatic-Colorimetric Method (Megazyme) (%)	12	11	11.76	1.032	0.6006	0.2749	0.6606	5.22%	2.39%	5.74%	2.403
012.04	Starch, Enzymatic-Enzyme Membrane Technology (YSI) (%)	7	7	12.42	1.652	1.641	0.2737	1.663	13.21%	2.20%	13.39%	6.078
013.00	Fat, Pretreat, Acid hydrolysis (%)	16	14	5.284	0.5534	0.4229	0.1773	0.4585	8.18%	3.43%	8.87%	2.587
013.02	Fat, Pretreat, Mojonnier, Bak Ext, Acid hydrolysis (%)	12	12	5.455	0.6864	0.6819	0.1112	0.6909	12.50%	2.04%	12.66%	6.213
013.10	Fat, Pretreat, Soxtec-Acid Hydrolysis (%)	6	5	5.019	0.1919	0.0393	0.0635	0.0747	0.80%	1.28%	1.51%	1.176
013.13	Fat, Pretreat, Ankom- Acid Hydrolysis (%)	10	9	5.567	0.8990	0.4132	0.2714	0.4943	7.77%	5.10%	9.30%	1.822
015.43	Aluminum, ICP, Microwave (ppm)	7	7	114.1	16.83	16.72	2.775	16.95	14.65%	2.43%	14.86%	6.108
017.41	Boron, ICP, Dry ash (ppm)	5	5	9.568	1.097	1.077	0.2964	1.117	11.25%	3.10%	11.67%	3.768
017.42	Boron, ICP, Open vessel (ppm)	5	5	8.162	0.7622	0.7472	0.2129	0.7769	9.15%	2.61%	9.52%	3.650
017.43	Boron, ICP, Microwave (ppm)	7	5	8.960	0.7232		0.3496			3.78%		

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
019.00	Calcium, Ox-Mn04 Vol. (%)	6	6	1.025	0.0743	0.0739	0.0118	0.0748	7.20%	1.15%	7.29%	6.329
019.08	Calcium, EDTA (%)	12	12	1.034	0.0498	0.0484	0.0163	0.0511	4.68%	1.57%	4.94%	3.142
019.31	Calcium, AAS, Dry ash (%)	17	15	0.9302	0.2145	0.0715	0.0177	0.0737	7.33%	1.82%	7.55%	4.154
019.41	Calcium, ICP, Dry ash (%)	17	17	1.015	0.0580	0.0570	0.0156	0.0591	5.61%	1.54%	5.82%	3.779
019.42	Calcium, ICP, Open vessel (%)	17	14	1.019	0.0981	0.0786	0.0208	0.0813	7.82%	2.07%	8.09%	3.905
019.43	Calcium, ICP, Microwave (%)	29	25	1.018	0.0544	0.0453	0.0161	0.0481	4.47%	1.59%	4.75%	2.983
019.99	Calcium, Miscellaneous (%)	8	8	0.9913	0.0477	0.0463	0.0162	0.0491	4.67%	1.63%	4.95%	3.029
021.43	Cobalt, ICP, Microwave (ppm)	8	6	1.800	0.3420	0.1255	0.0502	0.1352	6.58%	2.63%	7.08%	2.692
022.31	Copper, AAS, Dry ash (ppm)	11	8	21.61	10.13	1.580	0.7030	1.729	8.65%	3.85%	9.46%	2.459
022.41	Copper, ICP, Dry ash (ppm)	13	11	16.19	1.981	2.048	0.2703	2.066	12.59%	1.66%	12.70%	7.641
022.42	Copper, ICP, Open vessel (ppm)	17	15	18.14	1.297	1.308	0.2756	1.336	7.19%	1.52%	7.35%	4.848
022.43	Copper, ICP, Microwave (ppm)	29	29	17.76	1.305	1.185	0.7739	1.415	6.67%	4.36%	7.97%	1.829
025.31	Iron, AAS, Dry ash (ppm)	11	9	257.4	38.40	34.65	3.181	34.80	13.80%	1.27%	13.86%	10.94
025.41	Iron, ICP, Dry ash (ppm)	15	15	260.8	17.93	17.53	5.358	18.33	6.72%	2.05%	7.03%	3.421
025.42	Iron, ICP, Open vessel (ppm)	15	13	247.1	41.91	27.26	6.666	28.06	10.66%	2.61%	10.97%	4.209
025.43	Iron, ICP, Microwave (ppm)	26	25	257.7	29.94	22.02	10.20	24.27	8.42%	3.90%	9.28%	2.380
027.41	Magnesium, ICP, Dry ash (%)	13	12	0.3037	0.0138	0.0136	0.0032	0.0140	4.48%	1.05%	4.60%	4.399
027.42	Magnesium, ICP, Open vessel (%)	17	14	0.3122	0.0202	0.0159	0.0059	0.0169	5.12%	1.90%	5.46%	2.878
027.43	Magnesium, ICP, Microwave (%)	25	22	0.3069	0.0155	0.0157	0.0047	0.0163	5.10%	1.53%	5.32%	3.478
028.31	Manganese, AAS, Dry ash (ppm)	9	8	107.1	24.08	10.62	1.343	10.70	10.65%	1.35%	10.73%	7.968
028.41	Manganese, ICP, Dry ash (ppm)	13	11	100.4	6.092	2.706	2.304	3.554	2.65%	2.26%	3.48%	1.543
028.42	Manganese, ICP, Open vessel (ppm)	18	16	106.5	9.814	10.01	2.009	10.21	9.39%	1.88%	9.57%	5.084
028.43	Manganese, ICP, Microwave (ppm)	27	26	102.2	5.594	4.982	2.180	5.438	4.90%	2.14%	5.35%	2.494
031.01	Phosphorus, Photometric (%)	32	28	0.6332	0.0334	0.0244	0.0087	0.0260	3.86%	1.38%	4.10%	2.968
031.41	Phosphorus, ICP, Dry ash (%)	15	14	0.6323	0.0224	0.0219	0.0063	0.0228	3.47%	0.99%	3.61%	3.646
031.42	Phosphorus, ICP, Open vessel (%)	18	16	0.6483	0.0438	0.0304	0.0152	0.0340	4.76%	2.38%	5.33%	2.236
031.43	Phosphorus, ICP, Microwave (%)	31	27	0.6437	0.0332	0.0316	0.0082	0.0327	4.93%	1.27%	5.09%	3.993
031.99	Phosphorus, Miscellaneous (%)	6	6	0.6017	0.0670	0.0665	0.0108	0.0674	11.06%	1.80%	11.20%	6.242
032.31	Potassium, AAS, Dry ash (%)	9	7	1.016	0.1001	0.0568	0.0034	0.0569	5.44%	0.32%	5.44%	16.93
032.41	Potassium, ICP, Dry ash (%)	15	14	1.061	0.0476	0.0464	0.0151	0.0488	4.37%	1.43%	4.59%	3.219
032.42	Potassium, ICP, Open vessel (%)	17	17	1.091	0.0804	0.0790	0.0208	0.0817	7.25%	1.90%	7.49%	3.937
032.43	Potassium, ICP, Microwave (%)	29	27	1.054	0.1141	0.0588	0.0220	0.0628	5.49%	2.05%	5.86%	2.859
032.99	Potassium, Miscellaneous (%)	6	6	1.060	0.0497	0.0492	0.0106	0.0503	4.64%	1.00%	4.74%	4.748
033.00	Salt as chloride, Sol Cl (%)	17	16	0.3985	0.0943	0.0940	0.0104	0.0946	23.60%	2.61%	23.74%	9.101
033.01	Salt as chloride, Poten Cl (%)	26	24	0.4187	0.0653	0.0294	0.0086	0.0306	7.23%	2.11%	7.53%	3.568
033.99	Salt, Miscellaneous (%)	9	9	0.6265	0.2346	0.2343	0.0168	0.2349	37.39%	2.68%	37.49%	13.97
034.53	Selenium, Total (Se), ICP-MS, Microwave (ppm)	7	7	0.3762	0.0590	0.0561	0.0255	0.0617	14.92%	6.77%	16.39%	2.420
035.31	Sodium, AAS, Dry ash (%)	11	9	0.3364	0.0189	0.0088	0.0032	0.0094	2.58%	0.94%	2.75%	2.916
035.41	Sodium, ICP, Dry ash (%)	15	14	0.3499	0.0140	0.0139	0.0043	0.0145	3.97%	1.24%	4.16%	3.353
035.42	Sodium, ICP, Open vessel (%)	16	14	0.3456	0.0305	0.0238	0.0087	0.0254	6.80%	2.47%	7.24%	2.932
035.43	Sodium, ICP, Microwave (%)	27	24	0.3503	0.0206	0.0179	0.0070	0.0192	5.08%	2.00%	5.46%	2.728
036.04	Sulfur, LECO (%)	5	5	0.5710	0.0581	0.0571	0.0148	0.0590	10.00%	2.59%	10.33%	3.994
036.42	Sulfur, ICP, Open vessel (%)	16	15	0.5481	0.0395	0.0358	0.0087	0.0368	6.47%	1.58%	6.66%	4.221
036.43	Sulfur, ICP, Microwave (%)	21	19	0.5637	0.0462	0.0353	0.0101	0.0367	6.19%	1.77%	6.44%	3.639
037.31	Zinc, AAS, Dry ash (ppm)	10	8	120.5	19.00	4.511	1.631	4.797	3.83%	1.39%	4.08%	2.942
037.41	Zinc, ICP, Dry ash (ppm)	13	11	118.2	5.727	5.854	1.849	6.139	4.96%	1.57%	5.20%	3.320

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
037.42	Zinc, ICP, Open vessel (ppm)	17	17	119.0	10.82	10.39	4.235	11.22	8.73%	3.56%	9.43%	2.650
037.43	Zinc, ICP, Microwave (ppm)	30	29	117.9	7.570	7.390	2.915	7.944	6.26%	2.47%	6.73%	2.725
037.99	Zinc, Miscellaneous (ppm)	5	5	113.6	6.305	6.116	2.167	6.489	5.38%	1.91%	5.71%	2.994
038.43	Molybdenum, ICP, Microwave (ppm)	9	8	2.034	0.6006	0.2888	0.1387	0.3204	13.07%	6.28%	14.50%	2.310
042.00	Chloride, Titrimetric (%)	5	5	0.3130	0.0964	0.0962	0.0084	0.0965	30.72%	2.67%	30.84%	11.54
106.02	Vitamin A, LC (KU / kg)	12	10	21.76	4.092	2.075	1.639	2.644	10.01%	7.91%	12.76%	1.613
109.02	Vitamin E, LC (IU / kg)	10	10	115.4	23.69	23.37	5.431	23.99	20.26%	4.71%	20.80%	4.418
120.00	Alanine, Post-col Ninhydrin Der (%)	12	11	0.9613	0.0698	0.0282	0.0087	0.0295	2.99%	0.92%	3.13%	3.393
120.05	Alanine, Pre-col AQC Der (%)	10	9	0.9044	0.1051	0.1095	0.0154	0.1106	12.18%	1.72%	12.30%	7.164
121.00	Arginine, Post-col Ninhydrin Der (%)	12	10	1.124	0.1802	0.0328	0.0118	0.0349	2.81%	1.01%	2.98%	2.943
121.05	Arginine, Pre-col AQC Der (%)	10	10	1.154	0.1456	0.1447	0.0234	0.1466	12.54%	2.03%	12.70%	6.252
122.00	Aspartic, Post-col Ninhydrin Der (%)	12	12	1.441	0.0616	0.0607	0.0153	0.0626	4.21%	1.06%	4.34%	4.079
122.05	Aspartic, Pre-col AQC Der (%)	10	10	1.396	0.1303	0.1288	0.0279	0.1317	9.23%	2.00%	9.44%	4.721
124.00	Cysteine/Cystine, PAO Post-col Ninhydrin Der (%)	12	10	0.3386	0.0501	0.0347	0.0051	0.0350	9.90%	1.45%	10.01%	6.921
124.05	Cysteine/Cystine, PAO Pre-col AQC Der (%)	10	10	0.3381	0.0490	0.0481	0.0132	0.0499	14.24%	3.91%	14.76%	3.780
124.99	Cysteine/Cystine, Miscellaneous (%)	5	5	0.3008	0.0284	0.0273	0.0108	0.0294	9.09%	3.59%	9.77%	2.723
125.00	Glutamic, Post-col Ninhydrin Der (%)	12	11	3.100	0.2432	0.1246	0.0318	0.1286	3.94%	1.00%	4.07%	4.047
125.05	Glutamic, Pre-col AQC Der (%)	10	9	3.117	0.3796	0.2558	0.0517	0.2610	8.46%	1.71%	8.63%	5.043
126.00	Glycine, Post-col Ninhydrin Der (%)	12	11	0.8829	0.0813	0.0305	0.0097	0.0320	3.54%	1.12%	3.71%	3.302
126.05	Glycine, Pre-col AQC Der (%)	10	10	0.8558	0.1249	0.1246	0.0126	0.1252	14.56%	1.47%	14.63%	9.974
127.00	Histidine, Post-col Ninhydrin Der (%)	12	11	0.4763	0.0536	0.0284	0.0063	0.0291	5.79%	1.29%	5.94%	4.587
127.05	Histidine, Pre-col AQC Der (%)	10	10	0.4495	0.0625	0.0620	0.0106	0.0629	13.80%	2.36%	14.00%	5.925
128.00	Isoleucine, Post-col Ninhydrin Der (%)	12	12	0.6294	0.0391	0.0385	0.0094	0.0397	6.12%	1.49%	6.30%	4.219
128.05	Isoleucine, Pre-col AQC Der (%)	10	10	0.6203	0.0800	0.0794	0.0137	0.0806	12.80%	2.20%	12.99%	5.893
129.00	Leucine, Post-col Ninhydrin Der (%)	12	12	1.416	0.0505	0.0498	0.0117	0.0512	3.52%	0.83%	3.61%	4.370
129.05	Leucine, Pre-col AQC Der (%)	10	10	1.357	0.1413	0.1401	0.0258	0.1424	10.32%	1.90%	10.50%	5.530
130.00	L-Lysine, Post-col Ninhydrin Der (%)	13	12	0.8215	0.0361	0.0270	0.0130	0.0300	3.31%	1.60%	3.68%	2.305
130.05	L-Lysine, Pre-col AQC Der (%)	10	10	0.7625	0.0822	0.0806	0.0228	0.0837	10.56%	2.99%	10.98%	3.672
130.99	L-Lysine, Miscellaneous (%)	5	5	0.8065	0.0927	0.0838	0.0562	0.1009	10.39%	6.97%	12.51%	1.795
131.00	Methionine, PAO Post-col Ninhydrin Der (%)	12	10	0.2966	0.0435	0.0065	0.0098	0.0118	2.28%	3.46%	4.15%	1.197
131.05	Methionine, PAO Pre-col AQC Der (%)	10	10	0.3065	0.0514	0.0509	0.0095	0.0518	16.62%	3.09%	16.91%	5.470
131.99	Methionine, Miscellaneous (%)	5	5	0.2823	0.0591	0.0588	0.0084	0.0594	20.82%	2.97%	21.03%	7.073
132.00	Phenylalanine, Post-col Ninhydrin Der (%)	12	11	0.8107	0.0448	0.0241	0.0151	0.0284	2.93%	1.84%	3.46%	1.877
132.05	Phenylalanine, Pre-col AQC Der (%)	10	9	0.8041	0.1048	0.0924	0.0133	0.0933	11.75%	1.69%	11.87%	7.032
133.00	Proline, Post-col Ninhydrin Der (%)	12	11	1.112	0.1019	0.0641	0.0122	0.0653	5.89%	1.12%	6.00%	5.351
133.05	Proline, Pre-col AQC Der (%)	10	9	1.071	0.1123	0.0711	0.0203	0.0739	6.47%	1.85%	6.73%	3.639
134.00	Serine, Post-col Ninhydrin Der (%)	12	10	0.8206	0.0727	0.0320	0.0076	0.0329	3.78%	0.89%	3.88%	4.351
134.05	Serine, Pre-col AQC Der (%)	10	10	0.8229	0.1393	0.1388	0.0165	0.1398	16.87%	2.01%	16.99%	8.466
135.00	Threonine, Post-col Ninhydrin Der (%)	12	12	0.6233	0.0292	0.0283	0.0102	0.0301	4.54%	1.63%	4.82%	2.956
135.05	Threonine, Pre-col AQC Der (%)	10	10	0.6159	0.1033	0.1027	0.0152	0.1038	16.68%	2.47%	16.86%	6.834
136.03	Tryptophan, Alka-Hydrol + IS RP LC FI (%)	8	7	0.2377	0.0083	0.0083	0.0012	0.0084	3.48%	0.52%	3.52%	6.747
137.00	Tyrosine, Post-col Ninhydrin Der (%)	10	8	0.5871	0.0401	0.0427	0.0057	0.0431	7.27%	0.97%	7.33%	7.585
137.05	Tyrosine, Pre-col AQC Der (%)	10	10	0.5769	0.0841	0.0833	0.0163	0.0849	14.44%	2.82%	14.72%	5.223
138.00	Valine, Post-col Ninhydrin Der (%)	12	12	0.8244	0.0377	0.0364	0.0140	0.0390	4.41%	1.70%	4.73%	2.783
138.05	Valine, Pre-col AQC Der (%)	10	9	0.8056	0.0742	0.0476	0.0153	0.0500	5.77%	1.86%	6.07%	3.262
345.00	Amprolium, Colorimetric (ppm)	5	5	144.8	24.12	23.41	8.173	24.80	16.17%	5.64%	17.13%	3.034

**Test Material Code # 202323**

**Issue Date : 04/30/2023**

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
345.02	Amprolium, LC (UV or FL) (ppm)	9	9	141.4	7.958	7.581	3.424	8.318	5.36%	2.42%	5.88%	2.429
365.03	Monensin, LC-PCD (ppm)	7	6	33.80	3.853	3.809	0.8217	3.897	11.27%	2.43%	11.53%	4.742
365.05	Monensin, LC-MS/MS (ppm)	9	7	32.82	6.019	3.151	0.7297	3.234	10.22%	2.37%	10.49%	4.433
400.01	Water Activity, Aqualab chilled mirror (Units)	14	13	0.4635	0.0414	0.0310	0.0041	0.0312	6.79%	0.90%	6.85%	7.579
520.43	Chromium, Total (Cr), ICP, Microwave (ppm)	6	5	6.198	0.6421	0.6418	0.0314	0.6425	10.35%	0.51%	10.37%	20.49

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