



AAFCO
Association of American Feed Control Officials



Pet Food Ingredient Scheme

Fish Meal

Test Material Code # 202344

Method Summary Report

(Precision Report Follows)

Labs Reporting: 85

Methods Reported: 253

Issue Date : 12/31/2023

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
001.07	Loss on Drying, 104°C 3 hr, in malt (%)	45	44	7.133	0.2718	7.163	0.2174	0.0410	3.03%	0.0775	2.97%
001.99	Loss on Drying, Miscellaneous (%)	6	5	6.696	0.4861	6.696	0.4861	0.2717	7.26%	0.1550	3.00%
001.00	Loss on Drying, Vac 95°C 5 hr (%)	3	3	7.110	0.0935	7.110	0.0935	0.0540	1.32%	0.0737	2.98%
001.03	Loss on Drying, Low temp. methods (%)	2	2	6.668	0.7531						
002.06	Protein, Crude, Combustion Nitrogen Analyzer (%)	70	69	63.47	0.4360	63.52	0.3260	0.0491	0.51%	0.3136	1.25%
002.01	Protein, Crude, Auto Kjeld-Foss (%)	6	6	62.50	1.004	62.56	1.001	0.5106	1.60%	0.3356	1.26%
002.11	Protein, Crude, NIR (%)	2	2	62.16	3.224						
002.00	Protein, Crude, Crude (%)	1	1	62.46							
002.04	Protein, Crude, Copper Catalyst (%)	1	1	63.12							
002.05	Protein, Crude, Copper, Boric Acid (%)	1	1	60.39							
002.08	Protein, Crude, Cu/Ti (%)	1	1	63.39							
003.14	Fat, Crude, Ankom (%)	12	11	9.515	0.3048	9.496	0.3003	0.1132	3.16%	0.0498	2.85%
003.00	Fat, Crude, Diethyl Ether Ext., Direct (%)	6	6	9.883	0.5303	9.883	0.6013	0.3069	6.08%	0.5422	2.83%
003.10	Fat, Crude, Randall, Pet Ether (%)	5	5	9.473	0.0857	9.473	0.0857	0.0383	0.90%	0.1567	2.85%
003.06	Fat, Crude, Pet Ether (%)	3	3	9.893	0.6147	9.893	0.6147	0.3549	6.21%	0.0800	2.83%
003.09	Fat, Crude, Randall, Diethyl Ether Ext (%)	2	2	8.710	1.598						
003.11	Fat, Crude, NIR (%)	2	2	8.430	0.7920						
003.99	Fat, Crude, Miscellaneous (%)	2	2	6.478	3.857						
003.01	Fat, Crude, Diethyl Ether Ext (13th ed.), Indirect (%)	1	1	9.680							
003.12	Fat, Crude, Hexane Ext (%)	1	1	9.635							
003.13	Fat, Crude, Randall, Hexane Ext. (%)	1	1	9.380							
004.07	Fiber, Crude, ANKOM (%)	17	15	0.6357	0.4934	0.5997	0.4783	0.1544	79.76%	0.2147	4.32%
004.00	Fiber, Crude, Asbestos Free (%)	4	3	0.3098	0.1355	0.3098	0.1355	0.0958	43.74%	0.0765	4.77%
004.11	Fiber, Crude, NIR (%)	1	1	2.270							
004.06	Fiber, Crude, Fibertec (%)	1	1	0.0000							
005.00	Ash, 2h @ 600°C (%)	44	42	20.81	0.3115	20.77	0.1701	0.0328	0.82%	0.1106	2.19%
005.05	Ash, 3h @ 550°C (%)	18	17	20.86	0.1539	20.86	0.1736	0.0526	0.83%	0.0597	2.19%
005.99	Ash, Miscellaneous (%)	3	3	20.81	0.1631	20.81	0.1631	0.0942	0.78%	0.0700	2.19%
005.11	Ash, NIR (%)	2	2	19.56	0.8485						

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005.03	Ash, Microwave furnace (%)	1	1	20.55							
008.08	Fiber, Acid Detergent, Filter Bag - ANKOM (%)	9	8	2.407	1.283	2.329	1.272	0.5620	54.61%	0.2372	3.52%
008.02	Fiber, Acid Detergent, Crucible (%)	2	2	1.904	0.4251						
009.09	Fiber, Neutral Detergent, Filter Bag - ANKOM (%)	6	5	8.531	2.807	8.531	2.807	1.569	32.90%	0.8892	2.90%
009.07	Fiber, Neutral Detergent, AOAC -ENZ Pretreat (%)	2	2	8.018	0.7540						
009.99	Fiber, Neutral Detergent, Miscellaneous (%)	1	1	7.333							
010.99	Moisture, Miscellaneous (%)	2	2	6.983	0.4349						
010.11	Moisture, NIR (%)	1	1	6.530							
011.01	Loss on Drying, HT, 135°C 2hr (%)	17	17	7.831	0.4734	7.895	0.3413	0.1035	4.32%	0.0923	2.93%
011.02	Loss on Drying, HT, 130°C for 2 hours (%)	2	2	8.023	0.0460						
012.01	Starch, Enzymatic-Colorimetric Method (Megazyme) (%)	3	3	0.6646	0.9446	0.6646	0.9446	0.5454	142.14%	0.0558	4.25%
012.03	Starch, Enzymatic-Colorimetric Method, Miscellaneous (%)	1	1	0.8675							
013.02	Fat, Pretreat, Mojonier, Bak Ext, Acid hydrolysis (%)	31	31	9.772	1.528	9.904	1.280	0.2874	12.92%	0.3785	2.83%
013.13	Fat, Pretreat, Ankom- Acid Hydrolysis (%)	6	6	9.778	0.8162	9.624	0.5392	0.2751	5.60%	0.3556	2.84%
013.00	Fat, Pretreat, Acid hydrolysis (%)	3	3	10.35	0.1212	10.35	0.1212	0.0700	1.17%	0.3334	2.81%
013.10	Fat, Pretreat, Soxtec-Acid Hydrolysis (%)	2	2	10.23	0.2369						
015.43	Aluminum, ICP, Microwave (ppm)	3	3	1,141	235.2	1,141	235.2	135.8	20.61%	34.32	5.55%
015.41	Aluminum, ICP, Dry ash (ppm)	1	1	910.7							
015.53	Aluminum, ICP-MS, Microwave (ppm)	1	1	1,211							
017.43	Boron, ICP, Microwave (ppm)	4	4	6.854	1.097	6.854	1.097	0.5487	16.01%	0.3729	11.97%
017.41	Boron, ICP, Dry ash (ppm)	1	1	5.692							
017.53	Boron, ICP-MS, Microwave (ppm)	1	1	7.379							
019.44	Calcium, ICP, Dry ash (%)	21	21	5.032	0.3075	5.032	0.3488	0.0951	6.93%	0.1217	3.14%
019.43	Calcium, ICP, Microwave (%)	15	14	4.971	0.2697	4.970	0.2117	0.0707	4.26%	0.0790	3.14%
019.41	Calcium, ICP, Dry ash (%)	13	13	4.964	0.2118	4.964	0.2402	0.0833	4.84%	0.1257	3.14%
019.31	Calcium, AAS, Dry ash (%)	4	4	4.970	0.1535	4.970	0.1535	0.0768	3.09%	0.0780	3.14%
019.42	Calcium, ICP, Open vessel (%)	3	3	5.186	0.2279	5.186	0.2279	0.1316	4.39%	0.3017	3.12%
019.00	Calcium, Ox-Mn04 Vol. (%)	2	2	4.855	1.245						
019.53	Calcium, ICP-MS, Microwave (%)	2	2	5.105	0.2595						
019.99	Calcium, Miscellaneous (%)	2	2	4.555	0.0212						
021.41	Cobalt, ICP, Dry ash (ppm)	2	2	1.571	0.6727						
021.43	Cobalt, ICP, Microwave (ppm)	2	2	1.890	0.2972						
021.00	Cobalt, Color (ppm)	1	1	1.850							
021.31	Cobalt, AAS, Dry ash (ppm)	1	1	1.850							
021.53	Cobalt, ICP-MS, Microwave (ppm)	1	1	2.169							
022.44	Copper, ICP, Dry ash (ppm)	15	14	6.994	3.759	6.963	4.195	1.402	60.25%	1.028	11.95%
022.43	Copper, ICP, Microwave (ppm)	13	13	3.677	0.7343	3.545	0.5121	0.1775	14.45%	0.3797	13.22%
022.41	Copper, ICP, Dry ash (ppm)	8	8	3.805	0.6708	3.874	0.5904	0.2609	15.24%	0.4139	13.05%
022.42	Copper, ICP, Open vessel (ppm)	2	2	3.936	0.6141						
022.53	Copper, ICP-MS, Microwave (ppm)	2	2	3.124	0.5978						

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022.99	Copper, Miscellaneous (ppm)	1	1	1.500							
022.31	Copper, AAS, Dry ash (ppm)	2		0.1514							
025.43	Iron, ICP, Microwave (ppm)	16	16	946.6	80.92	948.5	77.52	24.22	8.17%	38.02	5.70%
025.41	Iron, ICP, Dry ash (ppm)	8	8	904.9	73.22	909.2	73.00	32.26	8.03%	25.28	5.74%
025.31	Iron, AAS, Dry ash (ppm)	3	3	930.9	34.65	930.9	34.65	20.00	3.72%	18.85	5.72%
025.42	Iron, ICP, Open vessel (ppm)	3	3	958.5	95.01	958.5	95.01	54.85	9.91%	57.62	5.69%
025.53	Iron, ICP-MS, Microwave (ppm)	2	2	981.5	0.9359						
025.99	Iron, Miscellaneous (ppm)	1	1	710.0							
027.44	Magnesium, ICP, Dry ash (%)	21	20	0.2452	0.0108	0.2448	0.0112	0.0031	4.58%	0.0107	4.94%
027.43	Magnesium, ICP, Microwave (%)	15	15	0.2439	0.0223	0.2457	0.0198	0.0064	8.07%	0.0129	4.94%
027.41	Magnesium, ICP, Dry ash (%)	13	12	0.2469	0.0084	0.2464	0.0083	0.0030	3.39%	0.0051	4.94%
027.31	Magnesium, AAS, Dry ash (%)	4	3	0.2370	0.0114	0.2370	0.0114	0.0066	4.82%	0.0013	4.97%
027.42	Magnesium, ICP, Open vessel (%)	3	3	0.2526	0.0273	0.2526	0.0273	0.0193	10.79%	0.0369	4.92%
027.53	Magnesium, ICP-MS, Microwave (%)	2	2	0.2513	0.0125						
027.99	Magnesium, Miscellaneous (%)	2	2	0.2500	0.0000						
028.44	Manganese, ICP, Dry ash (ppm)	19	19	60.81	4.767	60.81	5.405	1.550	8.89%	1.791	8.62%
028.43	Manganese, ICP, Microwave (ppm)	16	16	57.79	4.719	57.85	4.825	1.508	8.34%	1.707	8.69%
028.41	Manganese, ICP, Dry ash (ppm)	13	12	58.51	3.826	57.96	2.789	1.006	4.81%	0.4828	8.68%
028.31	Manganese, AAS, Dry ash (ppm)	3	3	58.61	4.991	58.61	4.991	2.881	8.52%	0.3600	8.67%
028.42	Manganese, ICP, Open vessel (ppm)	3	3	58.73	5.008	58.73	5.008	2.891	8.53%	7.207	8.67%
028.53	Manganese, ICP-MS, Microwave (ppm)	2	2	59.19	3.151						
028.99	Manganese, Miscellaneous (ppm)	1	1	56.00							
031.44	Phosphorus, ICP, Dry ash (%)	22	22	3.174	0.3326	3.174	0.3772	0.1005	11.88%	0.0974	3.36%
031.43	Phosphorus, ICP, Microwave (%)	14	14	3.155	0.2058	3.160	0.2197	0.0734	6.95%	0.0973	3.36%
031.41	Phosphorus, ICP, Dry ash (%)	12	11	3.068	0.1289	3.062	0.1327	0.0500	4.33%	0.0705	3.38%
031.01	Phosphorus, Photometric (%)	3	3	2.824	0.3420	2.824	0.3420	0.1974	12.11%	0.0573	3.42%
031.42	Phosphorus, ICP, Open vessel (%)	3	3	3.010	0.0941	3.010	0.0941	0.0543	3.13%	0.0923	3.39%
031.53	Phosphorus, ICP-MS, Microwave (%)	3	3	3.223	0.3768	3.223	0.3768	0.2175	11.69%	0.0964	3.35%
031.99	Phosphorus, Miscellaneous (%)	2	2	2.901	0.1291						
031.03	Phosphorus, Autoanalyzer (%)	1	1	3.057							
032.44	Potassium, ICP, Dry ash (%)	21	21	1.240	0.0670	1.240	0.0760	0.0207	6.13%	0.0404	3.87%
032.43	Potassium, ICP, Microwave (%)	15	15	1.217	0.0891	1.211	0.0642	0.0207	5.30%	0.0366	3.89%
032.41	Potassium, ICP, Dry ash (%)	13	12	1.233	0.0519	1.233	0.0588	0.0212	4.77%	0.0229	3.88%
032.31	Potassium, AAS, Dry ash (%)	3	3	1.233	0.0763	1.233	0.0763	0.0540	6.19%		3.88%
032.42	Potassium, ICP, Open vessel (%)	3	3	1.207	0.0403	1.207	0.0403	0.0233	3.34%	0.1067	3.89%
032.99	Potassium, Miscellaneous (%)	3	3	1.239	0.1062	1.239	0.1062	0.0751	8.57%		3.87%
032.53	Potassium, ICP-MS, Microwave (%)	2	2	1.235	0.0161						
033.01	Salt as chloride, Poten Cl (%)	3	3	2.326	0.0442	2.326	0.0442	0.0255	1.90%	0.0555	3.52%
033.00	Salt as chloride, Sol Cl (%)	1	1	2.297							
033.05	Salt as chloride, Ion Sel Electrode (%)	1	1	2.130							

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034.04	Selenium, Total (Se), AA, Hydride (ppm)	1	1	2.495							
034.43	Selenium, Total (Se), ICP, Microwave (ppm)	1	1	2.475							
034.51	Selenium, Total (Se), ICP-MS, Dry Ash (ppm)	1	1	2.250							
034.53	Selenium, Total (Se), ICP-MS, Microwave (ppm)	2	1	3.159							
035.41	Sodium, ICP, Dry ash (%)	33	33	0.9899	0.0458	0.9896	0.0509	0.0111	5.14%	0.0347	4.01%
035.43	Sodium, ICP, Microwave (%)	14	14	0.9628	0.0658	0.9691	0.0493	0.0165	5.09%	0.0375	4.02%
035.31	Sodium, AAS, Dry ash (%)	3	3	0.9437	0.1195	0.9437	0.1195	0.0690	12.66%	0.0074	4.03%
035.42	Sodium, ICP, Open vessel (%)	3	3	0.9662	0.0609	0.9662	0.0609	0.0351	6.30%	0.0603	4.02%
035.53	Sodium, ICP-MS, Microwave (%)	3	3	0.9838	0.0447	0.9838	0.0447	0.0258	4.55%	0.0286	4.01%
035.99	Sodium, Miscellaneous (%)	2	2	0.9700	0.0636						
036.43	Sulfur, ICP, Microwave (%)	8	8	1.005	0.0682	1.010	0.0642	0.0284	6.35%	0.0333	3.99%
036.42	Sulfur, ICP, Open vessel (%)	5	5	0.9484	0.0623	0.9484	0.0623	0.0278	6.56%	0.0390	4.03%
036.99	Sulfur, Miscellaneous (%)	2	2	0.8088	0.1078						
036.04	Sulfur, LECO (%)	1	1	1.125							
037.41	Zinc, ICP, Dry ash (ppm)	22	22	90.35	19.15	89.98	16.32	4.349	18.14%	11.33	8.13%
037.43	Zinc, ICP, Microwave (ppm)	16	16	99.43	7.969	99.30	7.865	2.458	7.92%	3.938	8.01%
037.31	Zinc, AAS, Dry ash (ppm)	3	3	103.7	3.112	103.7	3.112	1.797	3.00%	0.8000	7.96%
037.42	Zinc, ICP, Open vessel (ppm)	3	3	102.0	21.05	102.0	21.05	12.15	20.63%	5.017	7.97%
037.44	Zinc, ICP, Dry ash (ppm)	2	2	81.34	4.483						
037.53	Zinc, ICP-MS, Microwave (ppm)	2	2	96.13	5.542						
037.99	Zinc, Miscellaneous (ppm)	2	2	364.6	391.9						
038.41	Molybdenum, ICP, Dry ash (ppm)	2	2	0.2887	0.0336						
038.43	Molybdenum, ICP, Microwave (ppm)	2	2	0.3991	0.0694						
038.51	Molybdenum, ICP-MS, Dry ash (ppm)	1	1	0.3990							
038.53	Molybdenum, ICP-MS, Microwave (ppm)	1	1	0.4621							
040.53	Barium, ICP-MS, Microwave (ppm)	1	1	11.58							
041.53	Vanadium, ICP-MS, Microwave (ppm)	1	1	4.152							
042.02	Chloride, Ion Chromatography (%)	1	1	1.415							
101.99	Choline Chloride, Miscellaneous (ppm)	2	2	2,365	260.9						
102.01	Niacin, Microbiological (ppm)	1	1	115.0							
104.00	Riboflavin, Fluorometric (ppm)	1	1	1.086							
104.03	Riboflavin, LC (ppm)	1	1	1.275							
105.01	Thiamine, Fluorometer (ppm)	1		0.5000							
107.00	Vitamin B12, Microbiological (ppb)	1	1	319.0							
109.02	Vitamin E, LC (IU / kg)	1	1	8.000							
112.01	Pyridoxine, LC (µg / g)	2	2	0.7230	0.9433						
120.00	Alanine, Post-col Ninhydrin Der (%)	6	6	3.871	0.1411	3.876	0.1497	0.0764	3.86%	0.0585	3.26%
120.05	Alanine, Pre-col AQC Der (%)	3	3	3.612	0.7772	3.612	0.7772	0.5496	21.52%	0.0747	3.30%
120.99	Alanine, Miscellaneous (%)	2	2	2.263	2.365						
121.00	Arginine, Post-col Ninhydrin Der (%)	6	6	3.621	0.2313	3.621	0.2622	0.1338	7.24%	0.0789	3.30%

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121.05	Arginine, Pre-col AQC Der (%)	3	3	3.519	0.4883	3.519	0.4883	0.2819	13.87%	0.0239	3.31%
121.99	Arginine, Miscellaneous (%)	2	2	4.325	0.4808						
122.00	Aspartic, Post-col Ninhydrin Der (%)	6	6	5.389	0.2625	5.379	0.2748	0.1402	5.11%	0.1187	3.10%
122.05	Aspartic, Pre-col AQC Der (%)	3	3	4.816	1.314	4.816	1.314	0.7583	27.27%	0.1091	3.16%
122.99	Aspartic, Miscellaneous (%)	2	2	4.591	0.9740						
124.00	Cysteine/Cystine, PAO Post-col Ninhydrin Der (%)	6	6	0.4570	0.0303	0.4570	0.0343	0.0175	7.51%	0.0280	4.50%
124.05	Cysteine/Cystine, PAO Pre-col AQC Der (%)	3	3	0.6168	0.3058	0.6168	0.3058	0.2162	49.57%	0.0134	4.30%
124.99	Cysteine/Cystine, Miscellaneous (%)	2	2	0.9875	0.7106						
125.00	Glutamic, Post-col Ninhydrin Der (%)	6	6	7.826	0.3719	7.850	0.3654	0.1865	4.65%	0.0899	2.93%
125.05	Glutamic, Pre-col AQC Der (%)	3	3	7.023	1.799	7.023	1.799	1.039	25.62%	0.1360	2.98%
125.99	Glutamic, Miscellaneous (%)	2	2	6.198	2.740						
126.00	Glycine, Post-col Ninhydrin Der (%)	6	5	4.818	0.1974	4.818	0.1974	0.1104	4.10%	0.0282	3.16%
126.05	Glycine, Pre-col AQC Der (%)	3	3	4.611	0.7440	4.611	0.7440	0.4295	16.14%	0.0403	3.18%
126.99	Glycine, Miscellaneous (%)	2	2	4.563	0.3712						
127.00	Histidine, Post-col Ninhydrin Der (%)	6	6	1.343	0.0742	1.356	0.0517	0.0264	3.81%	0.0437	3.82%
127.05	Histidine, Pre-col AQC Der (%)	3	3	1.347	0.2355	1.347	0.2355	0.1360	17.48%	0.0104	3.82%
127.99	Histidine, Miscellaneous (%)	2	2	2.790	2.136						
128.00	Isoleucine, Post-col Ninhydrin Der (%)	6	6	2.323	0.1891	2.323	0.2144	0.1094	9.23%	0.0347	3.52%
128.05	Isoleucine, Pre-col AQC Der (%)	3	3	2.062	0.6603	2.062	0.6603			0.0523	3.59%
128.99	Isoleucine, Miscellaneous (%)	1	1	2.190							
129.00	Leucine, Post-col Ninhydrin Der (%)	6	5	4.114	0.1345	4.114	0.1345	0.0752	3.27%	0.0947	3.23%
129.05	Leucine, Pre-col AQC Der (%)	3	3	3.820	0.7757	3.820	0.7757	0.5485	20.31%	0.0438	3.27%
129.99	Leucine, Miscellaneous (%)	2	2	2.826	2.070						
130.00	L-Lysine, Post-col Ninhydrin Der (%)	6	6	4.592	0.3318	4.591	0.3762	0.1920	8.19%	0.0761	3.18%
130.05	L-Lysine, Pre-col AQC Der (%)	3	3	3.952	1.202	3.952	1.202	0.6937	30.40%	0.0157	3.25%
130.99	L-Lysine, Miscellaneous (%)	2	2	3.399	1.260						
131.00	Methionine, PAO Post-col Ninhydrin Der (%)	6	6	1.537	0.0945	1.541	0.0969	0.0494	6.28%	0.0652	3.75%
131.05	Methionine, PAO Pre-col AQC Der (%)	3	3	1.496	0.0195	1.496	0.0195	0.0138	1.31%	0.0502	3.76%
131.99	Methionine, Miscellaneous (%)	2	2	2.090	1.181						
132.00	Phenylalanine, Post-col Ninhydrin Der (%)	6	5	2.230	0.0891	2.230	0.0891	0.0498	4.00%	0.0196	3.54%
132.05	Phenylalanine, Pre-col AQC Der (%)	3	3	2.171	0.3371	2.171	0.3371	0.1946	15.53%	0.0143	3.56%
132.99	Phenylalanine, Miscellaneous (%)	2	2	2.485	0.4738						
133.00	Proline, Post-col Ninhydrin Der (%)	6	6	3.118	0.5654	2.939	0.1656	0.0845	5.63%	0.0326	3.40%
133.05	Proline, Pre-col AQC Der (%)	3	3	2.830	0.4995	2.830	0.4995	0.3532	17.65%	0.0367	3.42%
133.99	Proline, Miscellaneous (%)	2	2	2.478	0.3359						
134.00	Serine, Post-col Ninhydrin Der (%)	6	6	2.296	0.1525	2.312	0.1340	0.0684	5.80%	0.0776	3.53%
134.05	Serine, Pre-col AQC Der (%)	3	3	2.335	0.3080	2.335	0.3080	0.2178	13.19%	0.0337	3.52%
134.99	Serine, Miscellaneous (%)	2	2	1.461	1.222						
135.00	Threonine, Post-col Ninhydrin Der (%)	6	5	2.444	0.1738	2.444	0.1738	0.0972	7.11%	0.0278	3.50%
135.05	Threonine, Pre-col AQC Der (%)	3	3	2.142	0.3536	2.142	0.3536	0.2501	16.51%	0.0309	3.57%

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
135.99	Threonine, Miscellaneous (%)	2	2	1.958	0.3359						
136.99	Tryptophan, Miscellaneous (%)	3	3	0.4017	0.2532	0.4017	0.2532	0.1462	63.04%	0.0250	4.59%
136.00	Tryptophan, Alka-Hydrol Post-col Ninhyd (%)	2	2	0.6033	0.0590						
136.05	Tryptophan, Pre-col AQC Der (%)	2	2	0.6210	0.0715						
136.03	Tryptophan, Alka-Hydrol + IS RP LC FI (%)	1	1	0.5592							
137.00	Tyrosine, Post-col Ninhydrin Der (%)	5	5	1.687	0.2512	1.687	0.2512	0.1123	14.89%	0.0564	3.70%
137.05	Tyrosine, Pre-col AQC Der (%)	3	3	1.629	0.2724	1.629	0.2724	0.1573	16.72%	0.0153	3.72%
137.99	Tyrosine, Miscellaneous (%)	2	2	1.045	0.9405						
138.00	Valine, Post-col Ninhydrin Der (%)	6	6	2.711	0.1680	2.711	0.1905	0.0972	7.03%	0.0796	3.44%
138.05	Valine, Pre-col AQC Der (%)	3	3	2.499	0.7873	2.499	0.7873	0.5567	31.51%	0.0560	3.48%
138.99	Valine, Miscellaneous (%)	1	1	2.340							
139.00	Taurine, Post-col Ninhydrin Der (%)	2	2	0.6025	0.0177						
139.05	Taurine, Pre-col AQC Der (%)	1	1	0.5081							
357.99	Ethoxyquin, Miscellaneous (ppm)	1	1	700.5							
400.01	Water Activity, Aqualab chilled mirror (Units)	1	1	0.5347							
400.99	Water Activity, Miscellaneous (Units)	1	1	0.4955							
516.53	Arsenic, Total (As), ICP-MS, Microwave (ppm)	2	2	3.952	0.0807						
516.43	Arsenic, Total (As), ICP, Microwave (ppm)	1	1	3.580							
518.53	Cadmium, ICP-MS, Microwave (ppm)	2	2	0.1080	0.0042						
518.41	Cadmium, ICP, Dry ash (ppm)	1	1	0.1068							
518.43	Cadmium, ICP, Microwave (ppm)	2	1	0.1119							
520.43	Chromium, Total (Cr), ICP, Microwave (ppm)	3	3	4.700	0.6999	4.700	0.6999	0.4041	14.89%	0.2704	12.67%
520.41	Chromium, Total (Cr), ICP, Dry ash (ppm)	1	1	3.551							
520.53	Chromium, Total (Cr), ICP-MS, Microwave (ppm)	1	1	4.822							
526.53	Lead, ICP-MS, Microwave (ppm)	2	2	1.595	0.0780						
526.41	Lead, ICP, Dry ash (ppm)	1	1	1.381							
526.43	Lead, ICP, Microwave (ppm)	1	1	1.400							
529.99	Mercury, Miscellaneous (ppb)	1	1	53.63							
539.43	Nickel, ICP, Microwave (ppm)	2	2	2.177	0.5492						
539.41	Nickel, ICP, Dry ash (ppm)	1	1	1.653							
539.53	Nickel, ICP-MS, Microwave (ppm)	1	1	2.417							
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)	1		0.0200							
714.99	Myristic Acid (14:0) , Miscellaneous (%) (w/w)	2	2	0.6823	0.0880						
716.99	Palmitic Acid (16:0), Miscellaneous (%) (w/w)	2	2	1.915	0.0495						
718.99	Palmitoleic Acid (9c-16:1), Miscellaneous (%) (w/w)	2	2	0.8838	0.0477						
720.99	Margaric acid (17:0), Miscellaneous (%) (w/w)	2	2	0.0683	0.0025						

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
722.99	Stearic Acid (18:0), Miscellaneous (% (w/w))	2	2	0.3588	0.0195						
724.99	Oleic Acid (9c-18:1), Miscellaneous (% (w/w))	2	2	0.5335	0.1365						
726.99	Linoleic Acid (9c,12c-18:2), Miscellaneous (% (w/w))	2	2	0.1230	0.0042						
728.99	alpha-Linolenic Acid (9c,12c,15c-18:3), Miscellaneous (% (w/w))	2	2	0.1168	0.0025						
730.99	Arachidic Acid (20:0), Miscellaneous (% (w/w))	1	1	0.0225							
732.99	Gondoic Acid (11c-20:1), Miscellaneous (% (w/w))	2	2	0.0488	0.0088						
736.99	Arachidonic Acid (5c,8c,11c,14c-20:4), Miscellaneous (% (w/w))	2	2	0.1648	0.0428						
738.99	Mead Acid (11c,14c,17c-20:3), Miscellaneous (% (w/w))	1	1	0.0300							
740.99	Eicosapentaenoic Acid EPA (5c,8c,11c,14c,17c-20:5), Miscellaneous (% (w/w))	2	2	0.7055	0.0785						
742.99	Behenic Acid (22:0), Miscellaneous (% (w/w))	2	2	0.0203	0.0004						
744.99	Erucic Acid (13c-22:1), Miscellaneous (% (w/w))	2		0.0000							
746.99	Docosapentaenoic Acid n-3 DPA (7c,10c,13c,16c,19c-22:5), Miscellaneous (% (w/w))	2	2	0.1810	0.0269						
748.99	Lignoceric Acid (24:0), Miscellaneous (% (w/w))	2	2	0.0235	0.0050						
750.99	Docosahexaenoic Acid DHA (4c,7c,10c,13c,16c,19c-22:6), Miscellaneous (% (w/w))	2	2	0.8443	0.0838						
752.99	Nervonic Acid (24:1) isomers, Miscellaneous (% (w/w))	2	2	0.0313	0.0159						
754.99	Total n-3 Polyunsaturated (Omega-3) Fatty Acids, Miscellaneous (% (w/w))	2	2	2.094	0.2323						
756.99	Total n-6 Polyunsaturated (Omega-6) Fatty Acids, Miscellaneous (% (w/w))	2	2	0.3830	0.0396						
758.99	Total Saturated Fatty Acids, Miscellaneous (% (w/w))	2	2	3.182	0.1796						
762.99	Total Monounsaturated Fatty Acids, Miscellaneous (% (w/w))	1	1	1.605							
764.99	Total cis Monounsaturated Fatty Acids, Miscellaneous (% (w/w))	1	1	1.859							
766.99	Total Polyunsaturated Fatty Acids, Miscellaneous (% (w/w))	1	1	2.560							
768.99	Total cis Polyunsaturated Fatty Acids, Miscellaneous (% (w/w))	1	1	3.012							
770.99	Total Fat (equivalent to NLEA), Miscellaneous (% (w/w))	1	1	8.696							
772.99	Total Fatty Acids, Miscellaneous (% (w/w))	3	3	7.028	4.380	7.028	4.380	2.529	62.33%	0.1400	2.98%

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.



Pet Food Ingredient Scheme

Fish Meal

Test Material Code # 202344

Method Precision Report

Methods Reported: 58

Labs Reporting: 85

Issue Date : 12/31/2023

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 (%)	45	40	7.133	0.2718	0.2310	0.0969	0.2505	3.23%	1.36%	3.51%	2.584
001.99	Loss on Drying, Miscellaneous (%)	6	5	6.696	0.4861	0.4804	0.1044	0.4916	7.17%	1.56%	7.34%	4.709
002.01	Protein, Crude, Auto Kjel-Foss (%)	6	6	62.50	1.004	0.9902	0.2366	1.018	1.58%	0.38%	1.63%	4.303
002.06	Protein, Crude, Combustion Nitrogen Analyzer (%)	70	65	63.47	0.4360	0.3412	0.2776	0.4398	0.54%	0.44%	0.69%	1.585
003.00	Fat, Crude, Diethyl Ether Ext., Direct (%)	6	6	9.883	0.5303	0.3502	0.5630	0.6631	3.54%	5.70%	6.71%	1.178
003.10	Fat, Crude, Randall, Pet Ether (%)	5	5	9.473	0.0857		0.1428			1.51%		
003.14	Fat, Crude, Ankom (%)	12	10	9.515	0.3048	0.2776	0.0405	0.2805	2.90%	0.42%	2.93%	6.931
004.07	Fiber, Crude, ANKOM (%)	17	15	0.6357	0.4934	0.4736	0.1960	0.5125	74.49%	30.83%	80.62%	2.615
005.00	Ash, 2h @ 600°C (%)	44	39	20.81	0.3115	0.1354	0.0882	0.1615	0.65%	0.42%	0.78%	1.832
005.05	Ash, 3h @ 550°C (%)	18	17	20.86	0.1539	0.1499	0.0497	0.1579	0.72%	0.24%	0.76%	3.177
008.08	Fiber, Acid Detergent, Filter Bag - ANKOM (%)	9	7	2.407	1.283	0.8720	0.1649	0.8875	42.41%	8.02%	43.16%	5.382
009.09	Fiber, Neutral Detergent, Filter Bag - ANKOM (%)	6	5	8.531	2.807	2.742	0.8476	2.870	32.14%	9.93%	33.64%	3.386
011.01	Loss on Drying, HT, 135°C 2hr (%)	17	14	7.831	0.4734	0.3158	0.0622	0.3218	3.99%	0.79%	4.06%	5.173
013.02	Fat, Pretreat, Mojonner, Bak Ext, Acid hydrolysis (%)	31	28	9.772	1.528	1.149	0.3661	1.206	11.43%	3.64%	12.00%	3.293
013.13	Fat, Pretreat, Ankom- Acid Hydrolysis (%)	6	5	9.778	0.8162	0.1490	0.3582	0.3879	1.57%	3.79%	4.10%	1.083
019.41	Calcium, ICP, Dry ash (%)	13	12	4.964	0.2118	0.2065	0.0944	0.2271	4.17%	1.91%	4.59%	2.406
019.43	Calcium, ICP, Microwave (%)	15	13	4.971	0.2697	0.2103	0.0789	0.2246	4.27%	1.60%	4.56%	2.846
019.44	Calcium, ICP, Dry ash (%)	21	21	5.032	0.3075	0.2927	0.1333	0.3217	5.82%	2.65%	6.39%	2.413
022.41	Copper, ICP, Dry ash (ppm)	8	7	3.805	0.6708	0.6893	0.2919	0.7486	18.25%	7.73%	19.82%	2.565
022.43	Copper, ICP, Microwave (ppm)	13	12	3.677	0.7343	0.4990	0.2567	0.5611	14.14%	7.27%	15.90%	2.186
022.44	Copper, ICP, Dry ash (ppm)	15	13	6.994	3.759	3.850	0.9738	3.971	54.84%	13.87%	56.57%	4.078
025.41	Iron, ICP, Dry ash (ppm)	8	8	904.9	73.22	71.68	21.12	74.72	7.92%	2.33%	8.26%	3.539
025.43	Iron, ICP, Microwave (ppm)	16	15	946.6	80.92	68.70	30.04	74.98	7.34%	3.21%	8.01%	2.496
027.41	Magnesium, ICP, Dry ash (%)	13	12	0.2469	0.0084	0.0079	0.0041	0.0089	3.21%	1.64%	3.61%	2.196
027.43	Magnesium, ICP, Microwave (%)	15	14	0.2439	0.0223	0.0184	0.0086	0.0203	7.44%	3.47%	8.21%	2.364
027.44	Magnesium, ICP, Dry ash (%)	21	19	0.2452	0.0108	0.0072	0.0084	0.0111	2.95%	3.46%	4.55%	1.314
028.41	Manganese, ICP, Dry ash (ppm)	13	11	58.51	3.826	2.124	0.6833	2.231	3.69%	1.19%	3.87%	3.265
028.43	Manganese, ICP, Microwave (ppm)	16	15	57.79	4.719	4.073	1.647	4.393	7.12%	2.88%	7.68%	2.668
028.44	Manganese, ICP, Dry ash (ppm)	19	19	60.81	4.767	4.594	1.798	4.933	7.55%	2.96%	8.11%	2.744
031.41	Phosphorus, ICP, Dry ash (%)	12	11	3.068	0.1289	0.1197	0.0675	0.1374	3.90%	2.20%	4.48%	2.036
031.43	Phosphorus, ICP, Microwave (%)	14	13	3.155	0.2058	0.1956	0.0833	0.2126	6.23%	2.65%	6.77%	2.554
031.44	Phosphorus, ICP, Dry ash (%)	22	22	3.174	0.3326	0.3260	0.0935	0.3391	10.27%	2.95%	10.68%	3.627
032.41	Potassium, ICP, Dry ash (%)	13	11	1.233	0.0519	0.0535	0.0111	0.0546	4.34%	0.90%	4.43%	4.933
032.43	Potassium, ICP, Microwave (%)	15	13	1.217	0.0891	0.0412	0.0386	0.0564	3.40%	3.18%	4.65%	1.464
032.44	Potassium, ICP, Dry ash (%)	21	20	1.240	0.0670	0.0638	0.0323	0.0715	5.13%	2.60%	5.75%	2.213
035.41	Sodium, ICP, Dry ash (%)	33	32	0.9899	0.0458	0.0419	0.0267	0.0497	4.23%	2.70%	5.02%	1.860

Test Material Code # 202344

Issue Date : 12/31/2023

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
035.43	Sodium, ICP, Microwave (%)	14	12	0.9628	0.0658	0.0309	0.0240	0.0391	3.19%	2.48%	4.04%	1.629
036.42	Sulfur, ICP, Open vessel (%)	5	5	0.9484	0.0623	0.0586	0.0298	0.0657	6.18%	3.14%	6.93%	2.205
036.43	Sulfur, ICP, Microwave (%)	8	8	1.005	0.0682	0.0661	0.0237	0.0703	6.58%	2.36%	6.99%	2.959
037.41	Zinc, ICP, Dry ash (ppm)	22	21	90.35	19.15	14.32	10.84	17.96	16.26%	12.31%	20.40%	1.657
037.43	Zinc, ICP, Microwave (ppm)	16	15	99.43	7.969	6.281	3.735	7.308	6.39%	3.80%	7.43%	1.956
120.00	Alanine, Post-col Ninhydrin Der (%)	6	5	3.871	0.1411	0.1541	0.0234	0.1558	3.99%	0.61%	4.04%	6.646
121.00	Arginine, Post-col Ninhydrin Der (%)	6	6	3.621	0.2313	0.2241	0.0808	0.2382	6.19%	2.23%	6.58%	2.949
122.00	Aspartic, Post-col Ninhydrin Der (%)	6	6	5.389	0.2625	0.2536	0.0958	0.2711	4.71%	1.78%	5.03%	2.830
124.00	Cysteine/Cystine, PAO Post-col Ninhydri (%)	6	6	0.4570	0.0303	0.0270	0.0193	0.0332	5.91%	4.22%	7.26%	1.720
125.00	Glutamic, Post-col Ninhydrin Der (%)	6	6	7.826	0.3719	0.3664	0.0899	0.3773	4.68%	1.15%	4.82%	4.198
126.00	Glycine, Post-col Ninhydrin Der (%)	6	5	4.818	0.1974	0.1970	0.0179	0.1979	4.09%	0.37%	4.11%	11.03
127.00	Histidine, Post-col Ninhydrin Der (%)	6	5	1.343	0.0742		0.0428			3.12%		
128.00	Isoleucine, Post-col Ninhydrin Der (%)	6	6	2.323	0.1891	0.1873	0.0371	0.1909	8.06%	1.60%	8.22%	5.150
129.00	Leucine, Post-col Ninhydrin Der (%)	6	5	4.114	0.1345	0.1183	0.0903	0.1488	2.88%	2.19%	3.62%	1.648
130.00	L-Lysine, Post-col Ninhydrin Der (%)	6	5	4.592	0.3318	0.3242	0.0463	0.3275	7.16%	1.02%	7.24%	7.077
131.00	Methionine, PAO Post-col Ninhydrin Der (%)	6	6	1.537	0.0945	0.0877	0.0497	0.1008	5.71%	3.23%	6.56%	2.030
132.00	Phenylalanine, Post-col Ninhydrin Der (%)	6	5	2.230	0.0891	0.0885	0.0146	0.0897	3.97%	0.66%	4.02%	6.139
133.00	Proline, Post-col Ninhydrin Der (%)	6	5	3.118	0.5654	0.0894	0.0175	0.0911	3.09%	0.61%	3.15%	5.200
134.00	Serine, Post-col Ninhydrin Der (%)	6	6	2.296	0.1525	0.1448	0.0673	0.1597	6.31%	2.93%	6.96%	2.372
135.00	Threonine, Post-col Ninhydrin Der (%)	6	5	2.444	0.1738	0.1734	0.0178	0.1743	7.09%	0.73%	7.13%	9.793
137.00	Tyrosine, Post-col Ninhydrin Der (%)	5	5	1.687	0.2512	0.2476	0.0598	0.2547	14.68%	3.55%	15.10%	4.257
138.00	Valine, Post-col Ninhydrin Der (%)	6	6	2.711	0.1680	0.1583	0.0797	0.1772	5.84%	2.94%	6.54%	2.224

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