



AAFCO
Association of American Feed Control Officials



Animal Feed Scheme
Fish Feed, Multi-Species
Test Material Code # 202327

Method Summary Report
(Precision Report Follows)

Labs Reporting: 172
Methods Reported: 397
Issue Date : 08/31/2023

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
000.02	Urea, As protein, Colorimetric (%)	1	1	0.2000							
001.07	Loss on Drying, 104°C 3 hr, in malt (%)	47	45	7.699	0.5900	7.792	0.2461	0.0459	3.16%	0.1092	2.94%
001.99	Loss on Drying, Miscellaneous (%)	20	20	7.649	0.6539	7.715	0.5791	0.1619	7.51%	0.1321	2.94%
001.00	Loss on Drying, Vac 95°C 5 hr (%)	4	4	7.881	0.1745	7.881	0.1745	0.0873	2.21%	0.1081	2.93%
001.03	Loss on Drying, Low temp. methods (%)	1	1	7.955							
001.05	Loss on Drying, LECO (%)	1	1	7.957							
001.08	Loss on Drying, 102°C 16 hr, in meat (%)	1	1	7.967							
002.06	Protein, Crude, Combustion Nitrogen Analyzer (%)	115	114	36.93	0.4118	36.94	0.3051	0.0357	0.83%	0.1963	1.65%
002.05	Protein, Crude, Copper, Boric Acid (%)	26	26	36.26	0.3037	36.25	0.3284	0.0805	0.91%	0.2367	1.66%
002.01	Protein, Crude, Auto Kjel-Foss (%)	19	19	36.47	0.5803	36.40	0.4389	0.1259	1.21%	0.1201	1.66%
002.00	Protein, Crude, Crude (%)	3	3	36.52	1.190	36.52	1.190	0.6872	3.26%	0.3300	1.65%
002.08	Protein, Crude, Cu/Ti (%)	2	2	36.27	0.0168						
002.11	Protein, Crude, NIR (%)	2	2	38.05	1.096						
002.02	Protein, Crude, Semiauto Autoanalyzer (%)	1	1	36.75							
002.04	Protein, Crude, Copper Catalyst (%)	1	1	36.88							
003.14	Fat, Crude, Ankom (%)	50	49	3.986	0.3129	3.986	0.2509	0.0448	6.29%	0.1375	3.25%
003.10	Fat, Crude, Randall, Pet Ether (%)	28	27	3.927	0.1820	3.920	0.1894	0.0456	4.83%	0.0703	3.26%
003.06	Fat, Crude, Pet Ether (%)	14	14	4.161	0.5943	4.048	0.2942	0.0983	7.27%	0.1637	3.24%
003.00	Fat, Crude, Diethyl Ether Ext., Direct (%)	11	11	4.195	0.2608	4.158	0.1913	0.0721	4.60%	0.0777	3.23%
003.09	Fat, Crude, Randall, Diethyl Ether Ext (%)	11	11	4.113	0.3299	4.045	0.1646	0.0620	4.07%	0.1420	3.24%
003.13	Fat, Crude, Randall, Hexane Ext. (%)	6	6	4.023	0.3002	4.023	0.3405	0.1737	8.46%	0.1663	3.24%
003.99	Fat, Crude, Miscellaneous (%)	4	4	9.029	9.674	9.029	9.674	4.837	107.14%	0.5775	2.87%
003.01	Fat, Crude, Diethyl Ether Ext (13th ed.), Indirect (%)	3	3	4.274	0.2232	4.274	0.2232	0.1289	5.22%	0.1145	3.21%
003.12	Fat, Crude, Hexane Ext (%)	3	3	4.480	0.2080	4.480	0.2080	0.1201	4.64%	0.3333	3.19%
003.11	Fat, Crude, NIR (%)	2	2	4.338	2.365						
004.07	Fiber, Crude, ANKOM (%)	80	79	5.768	0.7421	5.764	0.7156	0.1006	12.42%	0.2487	3.07%
004.06	Fiber, Crude, Fibertec (%)	18	18	5.421	0.9199	5.570	0.6630	0.1954	11.90%	0.2205	3.09%
004.00	Fiber, Crude, Asbestos Free (%)	10	10	6.159	0.8760	6.079	0.8174	0.3231	13.45%	0.3258	3.05%
004.03	Fiber, Crude, Fritted Glass (%)	5	5	6.437	2.646	6.437	2.646	1.183	41.10%	0.2875	3.02%

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004.99	Fiber, Crude, Miscellaneous (%)	2	2	6.341	0.8355						
004.11	Fiber, Crude, NIR (%)	1	1	3.785							
005.00	Ash, 2h @ 600°C (%)	92	89	8.665	0.2104	8.661	0.2022	0.0268	2.33%	0.0753	2.89%
005.05	Ash, 3h @ 550°C (%)	26	26	8.885	0.1754	8.895	0.1598	0.0392	1.80%	0.0642	2.88%
005.99	Ash, Miscellaneous (%)	11	11	8.880	0.2894	8.898	0.2866	0.1080	3.22%	0.0812	2.88%
005.11	Ash, NIR (%)	2	2	11.92	1.195						
005.02	Ash, LECO (%)	1	1	9.002							
005.03	Ash, Microwave furnace (%)	1	1	8.450							
006.99	Total Sugars, Miscellaneous (%)	3	3	4.808	1.471	4.808	1.471	0.8490	30.58%	0.1850	3.16%
006.00	Total Sugars, As sucrose (%)	2	2	4.629	0.7909						
008.08	Fiber, Acid Detergent, Filter Bag - ANKOM (%)	47	46	10.56	1.923	10.58	2.055	0.3788	19.43%	0.2798	2.80%
008.02	Fiber, Acid Detergent, Crucible (%)	11	11	9.186	1.667	9.186	1.891	0.7126	20.58%	0.3450	2.86%
008.99	Fiber, Acid Detergent, Miscellaneous (%)	3	3	9.996	0.7644	9.996	0.7644	0.4413	7.65%	0.2633	2.83%
009.09	Fiber, Neutral Detergent, Filter Bag - ANKOM (%)	44	44	17.30	2.825	17.16	2.902	0.5468	16.90%	0.7724	2.41%
009.07	Fiber, Neutral Detergent, AOAC -ENZ Pretreat (%)	11	11	15.42	2.303	15.59	2.198	0.8285	14.10%	0.4291	2.53%
009.99	Fiber, Neutral Detergent, Miscellaneous (%)	1	1	20.01							
010.99	Moisture, Miscellaneous (%)	16	16	7.912	0.3274	7.923	0.3335	0.1042	4.21%	0.1029	2.93%
010.03	Moisture, Karl-Fischer (%)	2	2	6.935	0.6788						
010.11	Moisture, NIR (%)	1	1	8.245							
011.01	Loss on Drying, HT, 135°C 2hr (%)	67	65	8.486	0.5398	8.578	0.3311	0.0513	3.86%	0.1023	2.89%
011.99	Loss on Drying, HT, High Temp. Methods Miscellaneous (%)	3	3	8.549	0.0478	8.549	0.0478	0.0276	0.56%	0.1497	2.90%
011.02	Loss on Drying, HT, 130°C for 2 hours (%)	2	2	8.533	0.2086						
012.01	Starch, Enzymatic-Colorimetric Method (Megazyme) (%)	13	13	15.29	1.245	15.17	1.097	0.3803	7.23%	0.5286	2.57%
012.00	Starch, Polarimetric (Ewers) (%)	12	11	16.37	0.9974	16.35	1.095	0.4129	6.70%	0.1730	2.47%
012.04	Starch, Enzymatic-Enzyme Membrane Technology (YSI) (%)	7	7	15.71	0.9384	15.71	1.064	0.5027	6.77%	0.3690	2.52%
012.03	Starch, Enzymatic-Colorimetric Method, Miscellaneous (%)	2	2	13.89	0.8925						
012.99	Starch, Miscellaneous (%)	2	2	15.00	1.064						
012.11	Starch, NIR (%)	1	1	8.300							
012.20	Starch, Dietary, Enzymatic-Colorimetric (%)	1	1	15.18							
013.00	Fat, Pretreat, Acid hydrolysis (%)	23	22	6.213	0.7489	6.234	0.6947	0.1851	11.14%	0.1677	3.04%
013.02	Fat, Pretreat, Mojonier, Bak Ext, Acid hydrolysis (%)	17	17	6.455	0.5856	6.490	0.5755	0.1745	8.87%	0.1728	3.02%
013.13	Fat, Pretreat, Ankom- Acid Hydrolysis (%)	14	14	6.227	0.6852	6.214	0.7493	0.2503	12.06%	0.2845	3.04%
013.10	Fat, Pretreat, Soxtec-Acid Hydrolysis (%)	9	9	5.761	0.6721	5.873	0.4608	0.1920	7.85%	0.1101	3.06%
013.08	Fat, Pretreat, Roese-Gottlieb Modified, Alkaline Hydrolysis (%)	1	1	4.565							
015.43	Aluminum, ICP, Microwave (ppm)	9	9	101.8	21.82	103.7	14.98	6.240	14.44%	2.615	7.96%
015.42	Aluminum, ICP, Open vessel (ppm)	3	3	30.59	9.744	30.59	9.744	5.626	31.85%	2.167	9.56%
015.41	Aluminum, ICP, Dry ash (ppm)	2	2	90.74	1.747						
015.53	Aluminum, ICP-MS, Microwave (ppm)	2	2	103.8	3.639						
015.99	Aluminum, Miscellaneous (ppm)	1	1	51.30							
017.43	Boron, ICP, Microwave (ppm)	9	8	11.57	4.479	12.63	2.103	0.9294	16.65%	0.7415	10.92%

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017.42	Boron, ICP, Open vessel (ppm)	5	5	13.36	1.500	13.36	1.500	0.6709	11.23%	1.025	10.83%
017.41	Boron, ICP, Dry ash (ppm)	4	4	14.24	0.9257	14.24	0.9257	0.4629	6.50%	0.7097	10.73%
017.53	Boron, ICP-MS, Microwave (ppm)	1	1	13.65							
017.99	Boron, Miscellaneous (ppm)	1	1	13.85							
019.43	Calcium, ICP, Microwave (%)	32	32	1.394	0.0758	1.396	0.0753	0.0166	5.39%	0.0220	3.80%
019.42	Calcium, ICP, Open vessel (%)	21	21	1.376	0.1741	1.391	0.1383	0.0377	9.94%	0.0506	3.81%
019.31	Calcium, AAS, Dry ash (%)	18	18	1.333	0.0647	1.341	0.0444	0.0131	3.31%	0.0328	3.83%
019.41	Calcium, ICP, Dry ash (%)	18	18	1.355	0.0580	1.354	0.0638	0.0188	4.72%	0.0338	3.82%
019.08	Calcium, EDTA (%)	13	13	1.382	0.0816	1.383	0.0751	0.0260	5.43%	0.0288	3.81%
019.00	Calcium, Ox-Mn04 Vol. (%)	6	6	1.317	0.1281	1.358	0.0363	0.0185	2.67%	0.0217	3.82%
019.99	Calcium, Miscellaneous (%)	5	5	1.300	0.0469	1.300	0.0469	0.0210	3.61%	0.0280	3.84%
019.53	Calcium, ICP-MS, Microwave (%)	4	4	1.317	0.0419	1.317	0.0419	0.0209	3.18%	0.0429	3.84%
019.44	Calcium, ICP, Dry ash (%)	3	3	1.363	0.0346	1.363	0.0346	0.0200	2.54%	0.0086	3.82%
019.52	Calcium, ICP-MS, Open vessel (%)	2	2	1.464	0.0507						
019.02	Calcium, Hach Method (%)	1	1	2.455							
019.09	Calcium, Ion-selective electrode (%)	1	1	1.035							
019.32	Calcium, AAS, Open vessel (%)	1	1	1.355							
019.51	Calcium, ICP-MS, Dry ash (%)	1	1	1.300							
021.43	Cobalt, ICP, Microwave (ppm)	8	5	1.119	0.1202	1.119	0.1202	0.0672	10.74%	0.1112	15.73%
021.41	Cobalt, ICP, Dry ash (ppm)	5	4	0.9121	0.1961	0.9121	0.1961	0.0980	21.50%	0.0215	16.22%
021.42	Cobalt, ICP, Open vessel (ppm)	4	4	0.8659	0.2168	0.8659	0.2168	0.1084	25.04%	0.1157	16.35%
021.53	Cobalt, ICP-MS, Microwave (ppm)	3	3	1.070	0.0394	1.070	0.0394	0.0279	3.69%	0.0803	15.84%
021.52	Cobalt, ICP-MS, Open vessel (ppm)	2	2	0.5176	0.0956						
021.31	Cobalt, AAS, Dry ash (ppm)	1	1	1.169							
021.99	Cobalt, Miscellaneous (ppm)	1	1	0.9850							
022.43	Copper, ICP, Microwave (ppm)	29	27	17.30	1.074	17.36	1.029	0.2475	5.93%	0.6501	10.41%
022.42	Copper, ICP, Open vessel (ppm)	22	21	18.34	2.266	18.59	1.768	0.4822	9.51%	1.022	10.30%
022.31	Copper, AAS, Dry ash (ppm)	15	13	16.16	5.543	17.05	3.504	1.215	20.55%	1.326	10.44%
022.41	Copper, ICP, Dry ash (ppm)	14	13	15.36	2.125	15.54	1.946	0.6745	12.52%	0.4485	10.59%
022.53	Copper, ICP-MS, Microwave (ppm)	5	4	16.60	0.9853	16.60	0.9853	0.4927	5.93%	0.6667	10.48%
022.99	Copper, Miscellaneous (ppm)	4	4	16.05	1.903	16.05	1.903	0.9516	11.86%	0.8667	10.53%
022.44	Copper, ICP, Dry ash (ppm)	3	3	17.26	0.6801	17.26	0.6801	0.3926	3.94%	0.4666	10.42%
022.33	Copper, AAS, Microwave (ppm)	2	2	18.23	0.8132						
022.32	Copper, AAS, Open vessel (ppm)	1	1	18.70							
022.52	Copper, ICP-MS, Open vessel (ppm)	1	1	19.43							
025.43	Iron, ICP, Microwave (ppm)	27	26	323.0	26.87	325.1	21.81	5.346	6.71%	6.733	6.70%
025.42	Iron, ICP, Open vessel (ppm)	20	19	325.3	72.60	318.5	34.79	9.977	10.92%	20.95	6.72%
025.41	Iron, ICP, Dry ash (ppm)	16	16	316.9	21.55	317.1	23.82	7.443	7.51%	9.857	6.72%
025.31	Iron, AAS, Dry ash (ppm)	14	13	289.8	102.0	305.1	70.32	24.38	23.04%	2.946	6.76%
025.99	Iron, Miscellaneous (ppm)	4	4	293.1	18.34	293.1	18.34	9.171	6.26%	4.333	6.80%

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025.53	Iron, ICP-MS, Microwave (ppm)	3	3	287.5	63.81	287.5	63.81	36.84	22.19%	11.33	6.82%
025.33	Iron, AAS, Microwave (ppm)	1	1	328.4							
025.52	Iron, ICP-MS, Open vessel (ppm)	1	1	266.8							
027.43	Magnesium, ICP, Microwave (%)	30	30	0.4844	0.0245	0.4836	0.0261	0.0060	5.40%	0.0138	4.46%
027.42	Magnesium, ICP, Open vessel (%)	22	22	0.4846	0.0515	0.4910	0.0292	0.0078	5.94%	0.0213	4.45%
027.41	Magnesium, ICP, Dry ash (%)	14	14	0.4658	0.0203	0.4659	0.0227	0.0076	4.88%	0.0116	4.49%
027.31	Magnesium, AAS, Dry ash (%)	11	11	0.4386	0.1384	0.4685	0.0490	0.0185	10.45%	0.0104	4.48%
027.53	Magnesium, ICP-MS, Microwave (%)	4	4	0.4835	0.0318	0.4835	0.0318	0.0159	6.58%	0.0267	4.46%
027.99	Magnesium, Miscellaneous (%)	4	4	0.4700	0.0071	0.4700	0.0071	0.0035	1.50%	0.0200	4.48%
027.33	Magnesium, AAS, Microwave (%)	2	2	0.4690	0.0156						
027.44	Magnesium, ICP, Dry ash (%)	2	2	0.4840	0.0106						
027.52	Magnesium, ICP-MS, Open vessel (%)	2	2	0.5141	0.0161						
027.32	Magnesium, AAS, Open vessel (%)	1	1	0.4700							
027.51	Magnesium, ICP-MS, Dry ash (%)	1	1	0.4600							
028.43	Manganese, ICP, Microwave (ppm)	28	28	86.16	4.936	86.28	5.331	1.259	6.18%	1.834	8.18%
028.42	Manganese, ICP, Open vessel (ppm)	22	21	87.25	9.894	88.22	5.866	1.600	6.65%	1.723	8.15%
028.41	Manganese, ICP, Dry ash (ppm)	13	13	84.98	3.419	84.98	3.877	1.344	4.56%	1.553	8.20%
028.31	Manganese, AAS, Dry ash (ppm)	13	12	84.59	5.107	85.00	4.871	1.758	5.73%	2.004	8.20%
028.99	Manganese, Miscellaneous (ppm)	4	4	86.60	1.838	86.60	1.838	0.9190	2.12%	2.400	8.17%
028.44	Manganese, ICP, Dry ash (ppm)	3	3	79.17	10.80	79.17	10.80	6.234	13.64%	1.150	8.29%
028.53	Manganese, ICP-MS, Microwave (ppm)	3	3	85.06	1.336	85.06	1.336	0.7713	1.57%	2.086	8.20%
028.00	Manganese, Color (ppm)	1	1	90.25							
028.32	Manganese, AAS, Open vessel (ppm)	1	1	91.55							
028.33	Manganese, AAS, Microwave (ppm)	1	1	87.95							
028.34	Manganese, AAS, Dry ash (ppm)	1	1	54.26							
028.52	Manganese, ICP-MS, Open vessel (ppm)	1	1	92.38							
030.01	Nitrate, Ion-selective electrode (%)	1	1	0.0038							
031.01	Phosphorus, Photometric (%)	37	37	1.073	0.1234	1.094	0.0374	0.0077	3.42%	0.0235	3.95%
031.43	Phosphorus, ICP, Microwave (%)	32	31	1.116	0.0650	1.118	0.0533	0.0120	4.77%	0.0266	3.93%
031.42	Phosphorus, ICP, Open vessel (%)	22	21	1.121	0.1086	1.133	0.0734	0.0200	6.48%	0.0430	3.93%
031.41	Phosphorus, ICP, Dry ash (%)	17	17	1.064	0.0592	1.064	0.0671	0.0204	6.31%	0.0251	3.96%
031.44	Phosphorus, ICP, Dry ash (%)	4	4	1.093	0.0846	1.093	0.0846	0.0423	7.74%	0.0154	3.95%
031.99	Phosphorus, Miscellaneous (%)	4	3	1.058	0.0208	1.058	0.0208	0.0120	1.97%	0.0100	3.97%
031.03	Phosphorus, Autoanalyzer (%)	2	2	1.109	0.0191						
031.52	Phosphorus, ICP-MS, Open vessel (%)	2	2	1.193	0.0705						
031.53	Phosphorus, ICP-MS, Microwave (%)	2	2	1.156	0.0416						
031.06	Phosphorus, Hach Method (%)	1	1	0.6450							
031.51	Phosphorus, ICP-MS, Dry ash (%)	1	1	1.085							
032.43	Potassium, ICP, Microwave (%)	32	32	1.280	0.0543	1.277	0.0476	0.0105	3.73%	0.0326	3.86%
032.42	Potassium, ICP, Open vessel (%)	21	21	1.294	0.1510	1.308	0.1047	0.0286	8.00%	0.0507	3.84%

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032.41	Potassium, ICP, Dry ash (%)	14	14	1.205	0.0784	1.211	0.0714	0.0238	5.89%	0.0339	3.89%
032.31	Potassium, AAS, Dry ash (%)	9	9	1.206	0.0801	1.206	0.0908	0.0378	7.53%	0.0328	3.89%
032.99	Potassium, Miscellaneous (%)	5	4	1.278	0.0431	1.278	0.0431	0.0215	3.37%	0.0308	3.85%
032.52	Potassium, ICP-MS, Open vessel (%)	3	3	1.265	0.0398	1.265	0.0398	0.0230	3.15%	0.0090	3.86%
032.02	Potassium, Flame Emission (%)	2	2	1.235	0.0350						
032.32	Potassium, AAS, Open vessel (%)	2	2	1.020	0.3253						
032.44	Potassium, ICP, Dry ash (%)	2	2	1.297	0.1027						
032.53	Potassium, ICP-MS, Microwave (%)	2	2	1.261	0.0553						
032.08	Potassium, Ion-selective electrode (%)	1	1	0.8600							
032.51	Potassium, ICP-MS, Dry ash (%)	1	1	1.195							
033.01	Salt as chloride, Poten Cl (%)	28	26	0.9663	0.0561	0.9604	0.0334	0.0082	3.47%	0.0154	4.02%
033.00	Salt as chloride, Sol Cl (%)	20	19	0.8710	0.1750	0.9014	0.0835	0.0240	9.27%	0.0198	4.06%
033.99	Salt, Miscellaneous (%)	7	7	0.8537	0.1993	0.8537	0.2260	0.1068	26.47%	0.0452	4.10%
033.03	Salt as chloride, Quantab (%)	5	5	0.9410	0.1690	0.9410	0.1690	0.0756	17.96%	0.0875	4.04%
033.05	Salt as chloride, Ion Sel Electrode (%)	4	3	0.7490	0.1363	0.7490	0.1363	0.0964	18.19%		4.18%
034.53	Selenium, Total (Se), ICP-MS, Microwave (ppm)	8	8	0.5534	0.1059	0.5453	0.0985	0.0435	18.07%	0.0318	17.53%
034.04	Selenium, Total (Se), AA, Hydride (ppm)	4	3	0.4462	0.0401	0.4462	0.0401	0.0231	8.98%	0.0156	18.06%
034.52	Selenium, Total (Se), ICP-MS, Open vessel (ppm)	3	3	0.6099	0.1404	0.6099	0.1404	0.0993	23.03%	0.0210	17.23%
034.43	Selenium, Total (Se), ICP, Microwave (ppm)	4	2	0.4296	0.0069	0.4296	0.0069			0.0253	18.17%
034.01	Selenium, Total (Se), Fluor (ppm)	1	1	0.5570							
034.41	Selenium, Total (Se), ICP, Dry ash (ppm)	1	1	0.5210							
034.42	Selenium, Total (Se), ICP, Open vessel (ppm)	2	1	0.9430							
034.99	Selenium, Total (Se), Miscellaneous (ppm)	1	1	1.080							
035.43	Sodium, ICP, Microwave (%)	25	25	0.4196	0.0320	0.4229	0.0168	0.0042	3.97%	0.0088	4.55%
035.42	Sodium, ICP, Open vessel (%)	19	18	0.4340	0.0371	0.4297	0.0268	0.0079	6.24%	0.0096	4.54%
035.41	Sodium, ICP, Dry ash (%)	15	15	0.4130	0.0184	0.4146	0.0161	0.0052	3.89%	0.0112	4.57%
035.31	Sodium, AAS, Dry ash (%)	10	10	0.5369	0.3640	0.4331	0.0631	0.0249	14.56%	0.0186	4.54%
035.99	Sodium, Miscellaneous (%)	4	4	0.4138	0.0111	0.4138	0.0111	0.0055	2.68%	0.0175	4.57%
035.05	Sodium, Flame Emission (%)	2	2	0.4100	0.0071						
035.52	Sodium, ICP-MS, Open vessel (%)	2	2	0.4324	0.0141						
035.53	Sodium, ICP-MS, Microwave (%)	2	2	0.3977	0.0038						
035.02	Sodium, Em Spect (%)	1	1	0.3900							
036.43	Sulfur, ICP, Microwave (%)	21	20	0.5291	0.0331	0.5295	0.0365	0.0102	6.89%	0.0130	4.40%
036.42	Sulfur, ICP, Open vessel (%)	20	18	0.5085	0.0334	0.5098	0.0332	0.0098	6.51%	0.0150	4.43%
036.04	Sulfur, LECO (%)	5	4	0.5279	0.0367	0.5279	0.0367	0.0183	6.95%	0.0036	4.40%
036.00	Sulfur, Gravimetric (%)	1	1	0.5500							
036.52	Sulfur, ICP-MS, Open vessel (%)	1	1	0.5466							
036.99	Sulfur, Miscellaneous (%)	1	1	0.4900							
037.43	Zinc, ICP, Microwave (ppm)	30	29	214.4	16.10	213.1	15.16	3.520	7.12%	5.237	7.14%
037.42	Zinc, ICP, Open vessel (ppm)	21	21	218.5	24.08	220.5	21.14	5.767	9.59%	8.373	7.10%

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037.41	Zinc, ICP, Dry ash (ppm)	14	14	212.4	21.85	209.8	17.93	5.990	8.55%	4.775	7.16%
037.31	Zinc, AAS, Dry ash (ppm)	13	13	225.4	45.24	217.0	11.21	3.886	5.16%	6.002	7.12%
037.53	Zinc, ICP-MS, Microwave (ppm)	4	4	189.9	15.03	189.9	15.03	7.516	7.92%	3.084	7.26%
037.99	Zinc, Miscellaneous (ppm)	4	4	208.8	10.44	208.8	10.44	5.222	5.00%	3.000	7.16%
037.44	Zinc, ICP, Dry ash (ppm)	3	3	192.4	25.18	192.4	25.18	14.54	13.09%	2.476	7.25%
037.33	Zinc, AAS, Microwave (ppm)	2	2	211.7	1.870						
037.32	Zinc, AAS, Open vessel (ppm)	1	1	206.0							
037.34	Zinc, AAS, Dry ash (ppm)	1	1	272.3							
037.52	Zinc, ICP-MS, Open vessel (ppm)	1	1	232.9							
038.43	Molybdenum, ICP, Microwave (ppm)	10	8	1.365	0.3204	1.404	0.2671	0.1180	19.03%	0.0689	15.20%
038.53	Molybdenum, ICP-MS, Microwave (ppm)	5	5	1.607	0.1429	1.607	0.1429	0.0639	8.89%	0.1551	14.89%
038.41	Molybdenum, ICP, Dry ash (ppm)	4	4	1.341	0.2423	1.341	0.2423	0.1211	18.07%	0.0443	15.31%
038.42	Molybdenum, ICP, Open vessel (ppm)	5	4	1.536	0.4134	1.536	0.4134	0.2067	26.90%	0.1988	15.00%
038.52	Molybdenum, ICP-MS, Open vessel (ppm)	2	2	1.386	0.1292						
038.99	Molybdenum, Miscellaneous (ppm)	1	1	1.675							
040.43	Barium, ICP, Microwave (ppm)	1	1	6.655							
040.53	Barium, ICP-MS, Microwave (ppm)	1	1	5.897							
041.53	Vanadium, ICP-MS, Microwave (ppm)	2	2	0.3049	0.0069						
041.43	Vanadium, ICP, Microwave (ppm)	1		2.000							
042.00	Chloride, Titrimetric (%)	4	3	0.5950	0.0350	0.5950	0.0350	0.0247	5.88%		4.32%
042.01	Chloride, Ion-selective electrode (%)	1	1	0.5200							
042.99	Chloride, Miscellaneous (%)	1	1	0.6100							
101.99	Choline Chloride, Miscellaneous (ppm)	1	1	1,920							
102.02	Niacin, LC (ppm)	4	4	48.86	20.31	48.86	20.31	10.16	41.57%	1.973	8.91%
102.01	Niacin, Microbiological (ppm)	1	1	150.0							
102.99	Niacin, Miscellaneous (ppm)	1	1	18.55							
103.02	Pantothenic Acid, LC (ppm)	2	2	36.47	1.655						
103.01	Pantothenic Acid, Microbiological (ppm)	1	1	36.95							
103.99	Pantothenic Acid, Miscellaneous (ppm)	1	1	44.55							
104.03	Riboflavin, LC (ppm)	4	4	7.571	1.970	7.571	1.970	0.9850	26.02%	0.5075	11.80%
104.00	Riboflavin, Fluorometric (ppm)	1	1	8.720							
104.99	Riboflavin, Miscellaneous (ppm)	1	1	4.955							
105.00	Thiamine, LC (ppm)	5	5	6.225	1.392	6.225	1.392	0.6223	22.36%	0.5460	12.15%
105.01	Thiamine, Fluorometer (ppm)	1	1	9.400							
106.02	Vitamin A, LC (KU / kg)	7	3	1.436	0.2134	1.436	0.2134	0.1540	14.86%	0.0098	
106.00	Vitamin A, Color (KU / kg)	1	1	0.9460							
106.01	Vitamin A, UV (KU / kg)	1	1	1.125							
107.99	Vitamin B12, Miscellaneous (ppb)	2	2	57.30	5.233						
107.00	Vitamin B12, Microbiological (ppb)	1	1	64.45							
108.02	Vitamin D3, LC (KU / kg)	6	6	0.8692	0.1593	0.8381	0.1023	0.0522	12.21%	0.1136	

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108.99	Vitamin D3, Miscellaneous (KU / kg)	1	1	0.8610							
109.02	Vitamin E, LC (IU / kg)	11	11	146.8	22.66	146.8	25.70	9.684	17.50%	7.085	
109.99	Vitamin E, Miscellaneous (IU / kg)	1	1	132.0							
111.98	Vitamin C, Ascorbic Acid, Miscellaneous (ppm)	1	1	45.95							
111.00	Vitamin C, Phosphorylated, LC (ppm)	1		4.400							
112.01	Pyridoxine, LC (µg / g)	4	3	10.29	0.8093	10.29	0.8093	0.4672	7.86%	0.0700	11.26%
112.99	Pyridoxine, Miscellaneous (µg / g)	1	1	4.555							
113.02	Folic acid, LC (ppm)	2	2	2.575	0.0856						
113.01	Folic Acid, Micro (ppm)	1	1	4.120							
113.99	Folic acid, Miscellaneous (ppm)	1	1	3.910							
114.99	Biotin, Miscellaneous (ppm)	3	3	0.9568	0.6332	0.9568	0.6332	0.3656	66.18%	0.1123	16.10%
115.00	Non Protein N (NPN), Urea + Am, Urease method (%)	1	1	0.1100							
115.99	Non Protein N (NPN), Miscellaneous (%)	1	1	0.8204							
118.01	Peroxide value, Titrimetric Method (meq/kg)	1	1	17.60							
118.99	Peroxide value, Miscellaneous (meq/kg)	1	1	7.080							
120.00	Alanine, Post-col Ninhydrin Der (%)	16	16	1.706	0.0502	1.706	0.0553	0.0173	3.24%	0.0178	3.69%
120.05	Alanine, Pre-col AQC Der (%)	10	10	1.651	0.1434	1.637	0.1261	0.0499	7.71%	0.0700	3.71%
120.99	Alanine, Miscellaneous (%)	3	3	1.647	0.1041	1.647	0.1041				3.71%
120.02	Alanine, Post-col OPA Der (%)	1	1	1.706							
121.00	Arginine, Post-col Ninhydrin Der (%)	16	16	3.017	0.1150	3.022	0.0786	0.0245	2.60%	0.0333	3.39%
121.05	Arginine, Pre-col AQC Der (%)	10	10	3.054	0.2445	3.054	0.2773	0.1096	9.08%	0.1102	3.38%
121.99	Arginine, Miscellaneous (%)	3	3	3.038	0.2315	3.038	0.2315	0.1637	7.62%		3.38%
121.02	Arginine, Post-col OPA Der (%)	1	1	2.917							
122.00	Aspartic, Post-col Ninhydrin Der (%)	16	16	3.145	0.0557	3.145	0.0632	0.0198	2.01%	0.0204	3.37%
122.05	Aspartic, Pre-col AQC Der (%)	10	10	3.075	0.2107	3.061	0.1946	0.0769	6.36%	0.1254	3.38%
122.99	Aspartic, Miscellaneous (%)	3	3	2.992	0.2551	2.992	0.2551	0.1804	8.53%		3.39%
122.02	Aspartic, Post-col OPA Der (%)	1	1	3.214							
124.00	Cysteine/Cystine, PAO Post-col Ninhydrin Der (%)	16	16	0.9072	0.0398	0.9040	0.0373	0.0117	4.12%	0.0153	4.06%
124.05	Cysteine/Cystine, PAO Pre-col AQC Der (%)	9	8	0.7920	0.1605	0.7892	0.1758	0.0777	22.27%	0.0259	4.14%
124.99	Cysteine/Cystine, Miscellaneous (%)	4	3	0.7117	0.1755	0.7117	0.1755	0.1241	24.66%		4.21%
124.02	Cysteine/Cystine, PAO Post-col OPA Der (%)	1	1	0.9160							
125.00	Glutamic, Post-col Ninhydrin Der (%)	16	16	5.801	0.1471	5.794	0.1491	0.0466	2.57%	0.0487	3.07%
125.05	Glutamic, Pre-col AQC Der (%)	10	10	5.751	0.4005	5.749	0.4496	0.1777	7.82%	0.1988	3.07%
125.99	Glutamic, Miscellaneous (%)	3	3	5.482	0.3925	5.482	0.3925	0.2775	7.16%		3.10%
125.02	Glutamic, Post-col OPA Der (%)	1	1	5.734							
126.00	Glycine, Post-col Ninhydrin Der (%)	16	15	1.949	0.0325	1.952	0.0308	0.0099	1.58%	0.0135	3.62%
126.05	Glycine, Pre-col AQC Der (%)	10	10	1.923	0.1448	1.953	0.0955	0.0377	4.89%	0.0418	3.62%
126.99	Glycine, Miscellaneous (%)	3	3	2.013	0.0874	2.013	0.0874				3.60%
126.02	Glycine, Post-col OPA Der (%)	1	1	2.028							
127.00	Histidine, Post-col Ninhydrin Der (%)	16	16	0.8048	0.0376	0.8031	0.0390	0.0122	4.86%	0.0114	4.13%

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127.05	Histidine, Pre-col AQC Der (%)	10	9	0.8038	0.0646	0.8053	0.0700	0.0292	8.69%	0.0230	4.13%
127.99	Histidine, Miscellaneous (%)	3	3	0.8067	0.0611	0.8067	0.0611				4.13%
127.02	Histidine, Post-col OPA Der (%)	1	1	0.7520							
128.00	Isoleucine, Post-col Ninhydrin Der (%)	16	16	1.413	0.0739	1.406	0.0689	0.0215	4.90%	0.0177	3.80%
128.05	Isoleucine, Pre-col AQC Der (%)	10	10	1.443	0.1927	1.448	0.1236	0.0489	8.54%	0.0248	3.78%
128.99	Isoleucine, Miscellaneous (%)	3	3	1.383	0.0851	1.383	0.0851				3.81%
128.02	Isoleucine, Post-col OPA Der (%)	1	1	1.334							
129.00	Leucine, Post-col Ninhydrin Der (%)	16	15	2.603	0.0519	2.605	0.0533	0.0172	2.05%	0.0170	3.46%
129.05	Leucine, Pre-col AQC Der (%)	10	10	2.532	0.1697	2.532	0.1925	0.0761	7.60%	0.0593	3.48%
129.99	Leucine, Miscellaneous (%)	3	3	2.612	0.1402	2.612	0.1402	0.0991	5.37%		3.46%
129.02	Leucine, Post-col OPA Der (%)	1	1	2.504							
130.00	L-Lysine, Post-col Ninhydrin Der (%)	16	16	1.536	0.0520	1.533	0.0392	0.0123	2.56%	0.0241	3.75%
130.05	L-Lysine, Pre-col AQC Der (%)	10	10	1.510	0.0778	1.510	0.0882	0.0349	5.84%	0.0820	3.76%
130.99	L-Lysine, Miscellaneous (%)	5	5	1.563	0.2707	1.563	0.2707	0.1210	17.32%	0.1377	3.74%
130.02	L-Lysine, Post-col OPA Der (%)	1	1	1.599							
131.00	Methionine, PAO Post-col Ninhydrin Der (%)	16	16	0.4871	0.0333	0.4827	0.0267	0.0084	5.54%	0.0096	4.46%
131.05	Methionine, PAO Pre-col AQC Der (%)	10	9	0.4698	0.0618	0.4698	0.0700	0.0292	14.91%	0.0188	4.48%
131.99	Methionine, Miscellaneous (%)	4	3	0.5133	0.0611	0.5133	0.0611	0.0432	11.90%		4.42%
131.02	Methionine, PAO Post-col OPA Der (%)	1	1	0.4565							
132.00	Phenylalanine, Post-col Ninhydrin Der (%)	16	16	1.827	0.0591	1.832	0.0531	0.0166	2.90%	0.0325	3.65%
132.05	Phenylalanine, Pre-col AQC Der (%)	10	10	1.802	0.1887	1.782	0.1529	0.0605	8.58%	0.0614	3.67%
132.99	Phenylalanine, Miscellaneous (%)	3	3	1.867	0.0907	1.867	0.0907	0.0642	4.86%		3.64%
132.02	Phenylalanine, Post-col OPA Der (%)	1	1	1.745							
133.00	Proline, Post-col Ninhydrin Der (%)	16	16	2.153	0.1398	2.147	0.1309	0.0409	6.10%	0.0272	3.57%
133.05	Proline, Pre-col AQC Der (%)	10	10	2.197	0.1941	2.205	0.2031	0.0803	9.21%	0.0863	3.55%
133.99	Proline, Miscellaneous (%)	3	3	2.193	0.0929	2.193	0.0929	0.0657	4.24%		3.55%
134.00	Serine, Post-col Ninhydrin Der (%)	16	16	2.315	0.0987	2.321	0.0629	0.0197	2.71%	0.0325	3.52%
134.05	Serine, Pre-col AQC Der (%)	10	10	2.285	0.3190	2.342	0.2017	0.0797	8.62%	0.0754	3.52%
134.99	Serine, Miscellaneous (%)	3	3	2.213	0.1437	2.213	0.1437	0.0830	6.49%	0.0400	3.55%
134.02	Serine, Post-col OPA Der (%)	1	1	2.234							
135.00	Threonine, Post-col Ninhydrin Der (%)	16	14	1.401	0.0435	1.405	0.0368	0.0123	2.62%	0.0174	3.80%
135.05	Threonine, Pre-col AQC Der (%)	10	9	1.375	0.1684	1.393	0.1193	0.0497	8.57%	0.0316	3.81%
135.99	Threonine, Miscellaneous (%)	4	3	1.330	0.1375	1.330	0.1375				3.83%
135.02	Threonine, Post-col OPA Der (%)	1	1	1.349							
136.03	Tryptophan, Alka-Hydrol + IS RP LC FI (%)	8	8	0.4367	0.0318	0.4367	0.0359	0.0159	8.23%	0.0050	4.53%
136.05	Tryptophan, Pre-col AQC Der (%)	4	4	0.3004	0.0835	0.3004	0.0835	0.0418	27.80%	0.0189	4.79%
136.00	Tryptophan, Alka-Hydrol Post-col Ninhyd (%)	2	2	0.4205	0.0700						
136.01	Tryptophan, Alka-Hydrol Rev Phase LC UV (%)	2	2	0.4293	0.0145						
136.99	Tryptophan, Miscellaneous (%)	2	2	0.3586	0.0090						
136.02	Tryptophan, Alka-Hydrol Post-col OPA De (%)	1	1	0.4045							

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137.00	Tyrosine, Post-col Ninhydrin Der (%)	13	12	1.066	0.0951	1.067	0.0842	0.0304	7.89%	0.0138	3.96%
137.05	Tyrosine, Pre-col AQC Der (%)	9	8	1.100	0.2046	1.073	0.1646	0.0727	15.33%	0.0210	3.96%
137.99	Tyrosine, Miscellaneous (%)	3	3	1.193	0.2200	1.193	0.2200	0.1270	18.44%	0.0400	3.89%
137.02	Tyrosine, Post-col OPA Der (%)	1	1	0.8845							
138.00	Valine, Post-col Ninhydrin Der (%)	16	15	1.899	0.1163	1.896	0.1154	0.0373	6.09%	0.0219	3.63%
138.05	Valine, Pre-col AQC Der (%)	10	10	1.898	0.1717	1.912	0.1600	0.0632	8.37%	0.0671	3.63%
138.99	Valine, Miscellaneous (%)	3	3	1.977	0.1002	1.977	0.1002	0.0708	5.07%		3.61%
138.02	Valine, Post-col OPA Der (%)	1	1	2.008							
139.00	Taurine, Post-col Ninhydrin Der (%)	2	2	0.1100	0.0919						
139.05	Taurine, Pre-col AQC Der (%)	2	2	0.0148	0.0039						
139.99	Taurine, Miscellaneous (%)	1	1	0.0100							
139.02	Taurine, Post-col OPA Der (%)	1		0.0100							
160.10	Fructose, HPAEC PAD (%)	1	1	0.0450							
160.99	Fructose, Miscellaneous (%)	1	1	0.1950							
161.10	Galactose, HPAEC PAD (%)	1		0.0000							
162.10	Glucose, HPAEC PAD (%)	1	1	0.0300							
162.99	Glucose, Miscellaneous (%)	1		0.1500							
163.10	Lactose, HPAEC PAD (%)	1		0.0000							
163.99	Lactose, Miscellaneous (%)	1		0.1500							
164.10	Maltose, HPAEC PAD (%)	1		0.0000							
164.99	Maltose, Miscellaneous (%)	1		0.1500							
165.10	Sucrose, HPAEC PAD (%)	1	1	2.420							
165.99	Sucrose, Miscellaneous (%)	1	1	2.535							
166.10	Raffinose, HPAEC PAD (%)	1	1	1.935							
166.99	Raffinose, Miscellaneous (%)	1	1	1.620							
167.10	Stachyose, HPAEC PAD (%)	1	1	0.8350							
167.99	Stachyose, Miscellaneous (%)	1	1	0.8200							
400.01	Water Activity, Aqualab chilled mirror (Units)	14	14	0.5015	0.0379	0.4999	0.0259	0.0086	5.17%	0.0070	
400.99	Water Activity, Miscellaneous (Units)	2	2	0.4923	0.0110						
516.53	Arsenic, Total (As), ICP-MS, Microwave (ppm)	3	3	0.2527	0.0268	0.2527	0.0268	0.0155	10.59%	0.0195	19.68%
516.00	Arsenic, Total (As), AA, Hydride (ppm)	1	1	0.1555							
516.52	Arsenic, Total (As), ICP-MS, Open vessel (ppm)	1	1	0.2591							
516.43	Arsenic, Total (As), ICP, Microwave (ppm)	2		5.000							
518.43	Cadmium, ICP, Microwave (ppm)	5	3	0.0749	0.0126	0.0749	0.0126	0.0073	16.82%	0.0121	22.00%
518.53	Cadmium, ICP-MS, Microwave (ppm)	3	3	0.0828	0.0016	0.0828	0.0016	0.0011	1.89%	0.0045	22.00%
518.41	Cadmium, ICP, Dry ash (ppm)	1	1	0.0685							
518.42	Cadmium, ICP, Open vessel (ppm)	1	1	0.1170							
518.52	Cadmium, ICP-MS, Open vessel (ppm)	1	1	0.0849							
518.99	Cadmium, Miscellaneous (ppm)	1	1	0.0844							
520.43	Chromium, Total (Cr), ICP, Microwave (ppm)	7	6	3.024	0.8327	3.024	0.9443	0.4819	31.22%	0.0283	13.54%

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
520.53	Chromium, Total (Cr), ICP-MS, Microwave (ppm)	4	4	3.136	0.4589	3.136	0.4589	0.2295	14.63%	0.1797	13.47%
520.42	Chromium, Total (Cr), ICP, Open vessel (ppm)	3	3	2.442	1.101	2.442	1.101	0.6357	45.09%	0.0583	13.99%
520.41	Chromium, Total (Cr), ICP, Dry ash (ppm)	1	1	1.845							
520.52	Chromium, Total (Cr), ICP-MS, Open vessel (ppm)	1	1	0.8407							
520.31	Chromium, Total (Cr), AAS, Dry ash (ppm)	1		0.1565							
526.53	Lead, ICP-MS, Microwave (ppm)	5	4	0.1130	0.0319	0.1130	0.0319	0.0160	28.25%	0.0105	22.00%
526.41	Lead, ICP, Dry ash (ppm)	1	1	0.1805							
526.42	Lead, ICP, Open vessel (ppm)	1	1	1.203							
526.43	Lead, ICP, Microwave (ppm)	3	1								
526.52	Lead, ICP-MS, Open vessel (ppm)	1	1	0.1378							
529.99	Mercury, Miscellaneous (ppb)	3	1								
539.43	Nickel, ICP, Microwave (ppm)	4	4	4.615	0.5934	4.615	0.5934	0.2967	12.86%	0.1394	12.71%
539.53	Nickel, ICP-MS, Microwave (ppm)	3	3	4.934	0.4926	4.934	0.4926	0.2844	9.99%	0.3511	12.58%
539.41	Nickel, ICP, Dry ash (ppm)	1	1	4.093							
539.42	Nickel, ICP, Open vessel (ppm)	1	1	8.374							
539.52	Nickel, ICP-MS, Open vessel (ppm)	1	1	4.007							
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))	2		0.0200							
708.99	Capric acid (10:0), Miscellaneous (% (w/w))	2	1	0.1050							
710.99	Lauric Acid (12:0), Miscellaneous (% (w/w))	4	2	0.0501	0.0635	0.0501	0.0635			0.0052	6.28%
714.99	Myristic Acid (14:0) , Miscellaneous (% (w/w))	3	3	0.2960	0.4322	0.2960	0.4322	0.3056	146.02%	0.0040	4.80%
716.99	Palmitic Acid (16:0), Miscellaneous (% (w/w))	3	3	7.415	10.84	7.415	10.84	7.664	146.19%	0.0453	2.96%
718.99	Palmitoleic Acid (9c-16:1), Miscellaneous (% (w/w))	4	3	0.1524	0.0056	0.1524	0.0056	0.0040	3.68%		5.31%
720.99	Margaric acid (17:0), Miscellaneous (% (w/w))	1		0.0200							
722.99	Stearic Acid (18:0), Miscellaneous (% (w/w))	3	3	1.626	2.389	1.626	2.389	1.689	146.93%	0.0051	3.72%
724.99	Oleic Acid (9c-18:1), Miscellaneous (% (w/w))	3	3	11.87	17.76	11.87	17.76			0.0234	2.76%
726.99	Linoleic Acid (9c,12c-18:2), Miscellaneous (% (w/w))	4	3	1.825	0.0441	1.825	0.0441	0.0312	2.42%	0.0346	3.65%
728.99	alpha-Linolenic Acid (9c,12c,15c-18:3), Miscellaneous (% (w/w))	4	3	0.1035	0.0025	0.1035	0.0025	0.0015	2.44%	0.0030	5.63%
730.99	Arachidic Acid (20:0), Miscellaneous (% (w/w))	3	3	0.1884	0.2742	0.1884	0.2742	0.1939	145.50%	0.0038	5.14%
732.99	Gondoic Acid (11c-20:1), Miscellaneous (% (w/w))	2	1	0.0187							
736.99	Arachidonic Acid (5c,8c,11c,14c-20:4), Miscellaneous (% (w/w))	2	1	0.0120							
740.99	Eicosapentaenoic Acid EPA (5c,8c,11c,14c,17c-20:5), Miscellaneous (% (w/w))	4	3	0.1074	0.1582	0.1074	0.1582	0.1118	147.28%	0.0105	5.60%
742.99	Behenic Acid (22:0), Miscellaneous (% (w/w))	3	2	0.1678	0.2082	0.1678	0.2082			0.0058	5.23%
744.99	Erucic Acid (13c-22:1), Miscellaneous (% (w/w))	3									
746.99	Docosapentaenoic Acid n-3 DPA (7c,10c,13c,16c,19c-22:5), Miscellaneous (% (w/w))	4									
748.99	Lignoceric Acid (24:0), Miscellaneous (% (w/w))	3	3	0.1902	0.2770	0.1902	0.2770	0.1959	145.68%	0.0159	5.13%
750.99	Docosahexaenoic Acid DHA (4c,7c,10c,13c,16c,19c-22:6), Miscellaneous (% (w/w))	4	3	0.0995	0.1433	0.0995	0.1433	0.1014	144.09%	0.0055	5.66%
752.99	Nervonic Acid (24:1) isomers, Miscellaneous (% (w/w))	2		0.0050							
754.99	Total n-3 Polyunsaturated (Omega-3) Fatty Acids, Miscellaneous (% (w/w))	2	2	0.1420	0.0028						

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
756.99	Total n-6 Polyunsaturated (Omega-6) Fatty Acids, Miscellaneous (% (w/w))	2	2	1.827	0.0180						
758.99	Total Saturated Fatty Acids, Miscellaneous (% (w/w))	2	2	14.26	17.97						
762.99	Total Monounsaturated Fatty Acids, Miscellaneous (% (w/w))	1	1	36.59							
764.99	Total cis Monounsaturated Fatty Acids, Miscellaneous (% (w/w))	1	1	1.858							
766.99	Total Polyunsaturated Fatty Acids, Miscellaneous (% (w/w))	1	1	33.30							
768.99	Total cis Polyunsaturated Fatty Acids, Miscellaneous (% (w/w))	1	1	1.969							
770.99	Total Fat (equivalent to NLEA), Miscellaneous (% (w/w))	1	1	5.689							
772.99	Total Fatty Acids, Miscellaneous (% (w/w))	2	2	5.410	0.0395						

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

Fish Feed, Multi-Species

Test Material Code # 202327

Method Precision Report

Methods Reported: 124

Labs Reporting: 172

Issue Date : 08/31/2023

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 (%)	47	41	7.699	0.5900	0.2590	0.1008	0.2779	3.32%	1.29%	3.56%	2.758
001.99	Loss on Drying, Miscellaneous (%)	20	17	7.649	0.6539	0.4338	0.1041	0.4461	5.59%	1.34%	5.75%	4.285
002.01	Protein, Crude, Auto Kjeld-Foss (%)	19	18	36.47	0.5803	0.3984	0.0871	0.4078	1.10%	0.24%	1.12%	4.681
002.05	Protein, Crude, Copper, Boric Acid (%)	26	25	36.26	0.3037	0.2498	0.2497	0.3532	0.69%	0.69%	0.97%	1.414
002.06	Protein, Crude, Combustion Nitrogen Analyzer (%)	115	110	36.93	0.4118	0.2887	0.1912	0.3463	0.78%	0.52%	0.94%	1.811
003.00	Fat, Crude, Diethyl Ether Ext., Direct (%)	11	10	4.195	0.2608	0.1367	0.0763	0.1565	3.31%	1.85%	3.79%	2.051
003.06	Fat, Crude, Pet Ether (%)	14	13	4.161	0.5943	0.2201	0.1181	0.2498	5.48%	2.94%	6.22%	2.115
003.09	Fat, Crude, Randall, Diethyl Ether Ext (%)	11	10	4.113	0.3299	0.0966	0.1151	0.1503	2.40%	2.86%	3.74%	1.306
003.10	Fat, Crude, Randall, Pet Ether (%)	28	26	3.927	0.1820	0.1797	0.0526	0.1872	4.58%	1.34%	4.77%	3.560
003.13	Fat, Crude, Randall, Hexane Ext. (%)	6	6	4.023	0.3002	0.2867	0.1260	0.3132	7.13%	3.13%	7.78%	2.486
003.14	Fat, Crude, Ankom (%)	50	47	3.986	0.3129	0.2701	0.1177	0.2946	6.80%	2.96%	7.42%	2.503
004.00	Fiber, Crude, Asbestos Free (%)	10	10	6.159	0.8760	0.8500	0.2995	0.9013	13.80%	4.86%	14.63%	3.009
004.03	Fiber, Crude, Fritted Glass (%)	5	5	6.437	2.646	2.642	0.2145	2.650	41.04%	3.33%	41.17%	12.36
004.06	Fiber, Crude, Fibertec (%)	18	17	5.421	0.9199	0.7427	0.2194	0.7744	13.38%	3.95%	13.95%	3.529
004.07	Fiber, Crude, ANKOM (%)	80	76	5.768	0.7421	0.6641	0.2659	0.7153	11.45%	4.59%	12.34%	2.691
005.00	Ash, 2h @ 600°C (%)	92	83	8.665	0.2104	0.1749	0.0618	0.1855	2.02%	0.71%	2.14%	3.000
005.05	Ash, 3h @ 550°C (%)	26	26	8.885	0.1754	0.1705	0.0581	0.1801	1.92%	0.65%	2.03%	3.102
005.99	Ash, Miscellaneous (%)	11	11	8.880	0.2894	0.2869	0.0537	0.2919	3.23%	0.60%	3.29%	5.437
008.02	Fiber, Acid Detergent, Crucible (%)	11	10	9.186	1.667	1.560	0.2525	1.581	17.41%	2.82%	17.64%	6.259
008.08	Fiber, Acid Detergent, Filter Bag - ANKOM (%)	47	44	10.56	1.923	1.871	0.2500	1.888	17.84%	2.38%	18.00%	7.552
009.07	Fiber, Neutral Detergent, AOAC -ENZ Pretreat (%)	11	11	15.42	2.303	2.290	0.3480	2.316	14.85%	2.26%	15.02%	6.654
009.09	Fiber, Neutral Detergent, Filter Bag - ANKOM (%)	44	43	17.30	2.825	2.584	0.6849	2.674	15.09%	4.00%	15.61%	3.904
010.99	Moisture, Miscellaneous (%)	16	15	7.912	0.3274	0.3332	0.0871	0.3444	4.21%	1.10%	4.35%	3.952
011.01	Loss on Drying, HT, 135°C 2hr (%)	67	60	8.486	0.5398	0.4094	0.0872	0.4186	4.78%	1.02%	4.89%	4.800
012.00	Starch, Polarimetric (Ewers) (%)	12	10	16.37	0.9974	0.9086	0.1175	0.9162	5.50%	0.71%	5.55%	7.800
012.01	Starch, Enzymatic-Colorimetric Method (Megazyme) (%)	13	11	15.29	1.245	0.7498	0.6720	1.007	5.01%	4.49%	6.72%	1.498
012.04	Starch, Enzymatic-Enzyme Membrane Technology (YSI) (%)	7	7	15.71	0.9384	0.9167	0.2837	0.9596	5.83%	1.81%	6.11%	3.383
013.00	Fat, Pretreat, Acid hydrolysis (%)	23	20	6.213	0.7489	0.6100	0.1310	0.6239	9.73%	2.09%	9.95%	4.762
013.02	Fat, Pretreat, Mojonier, Bak Ext, Acid hydrolysis (%)	17	16	6.455	0.5856	0.4613	0.1354	0.4808	7.05%	2.07%	7.35%	3.551
013.10	Fat, Pretreat, Soxtec-Acid Hydrolysis (%)	9	8	5.761	0.6721	0.3274	0.0975	0.3416	5.49%	1.64%	5.73%	3.504
013.13	Fat, Pretreat, Ankom- Acid Hydrolysis (%)	14	14	6.227	0.6852	0.6550	0.2844	0.7141	10.52%	4.57%	11.47%	2.511
015.43	Aluminum, ICP, Microwave (ppm)	9	7	101.8	21.82	13.97	1.946	14.11	12.80%	1.78%	12.93%	7.249
017.42	Boron, ICP, Open vessel (ppm)	5	5	13.36	1.500	1.398	0.7715	1.596	10.46%	5.77%	11.95%	2.069
017.43	Boron, ICP, Microwave (ppm)	9	7	11.57	4.479	1.366	0.7073	1.538	10.44%	5.41%	11.76%	2.175
019.00	Calcium, Ox-Mn04 Vol. (%)	6	5	1.317	0.1281	0.0154	0.0176	0.0234	1.12%	1.29%	1.71%	1.327
019.08	Calcium, EDTA (%)	13	12	1.382	0.0816	0.0839	0.0186	0.0860	6.07%	1.34%	6.21%	4.623

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
019.31	Calcium, AAS, Dry ash (%)	18	17	1.333	0.0647	0.0301	0.0327	0.0444	2.24%	2.43%	3.30%	1.359
019.41	Calcium, ICP, Dry ash (%)	18	18	1.355	0.0580	0.0547	0.0273	0.0611	4.04%	2.01%	4.51%	2.240
019.42	Calcium, ICP, Open vessel (%)	21	20	1.376	0.1741	0.1177	0.0413	0.1247	8.38%	2.94%	8.88%	3.021
019.43	Calcium, ICP, Microwave (%)	32	30	1.394	0.0758	0.0668	0.0166	0.0689	4.78%	1.19%	4.92%	4.147
019.99	Calcium, Miscellaneous (%)	5	5	1.300	0.0469	0.0443	0.0219	0.0494	3.41%	1.69%	3.80%	2.255
021.43	Cobalt, ICP, Microwave (ppm)	8	5	1.119	0.1202	0.1047	0.0833	0.1338	9.36%	7.45%	11.97%	1.606
022.31	Copper, AAS, Dry ash (ppm)	15	12	16.16	5.543	2.694	1.105	2.912	15.39%	6.31%	16.64%	2.635
022.41	Copper, ICP, Dry ash (ppm)	14	11	15.36	2.125	1.583	0.3498	1.621	9.99%	2.21%	10.23%	4.633
022.42	Copper, ICP, Open vessel (ppm)	22	20	18.34	2.266	1.237	1.132	1.676	6.60%	6.04%	8.95%	1.481
022.43	Copper, ICP, Microwave (ppm)	29	25	17.30	1.074	0.7762	0.5199	0.9342	4.44%	2.98%	5.35%	1.797
025.31	Iron, AAS, Dry ash (ppm)	14	11	289.8	102.0	52.76	2.093	52.80	17.18%	0.68%	17.20%	25.23
025.41	Iron, ICP, Dry ash (ppm)	16	15	316.9	21.55	21.49	7.447	22.74	6.80%	2.36%	7.19%	3.054
025.42	Iron, ICP, Open vessel (ppm)	20	18	325.3	72.60	34.53	24.31	42.23	11.10%	7.82%	13.58%	1.737
025.43	Iron, ICP, Microwave (ppm)	27	25	323.0	26.87	19.45	6.108	20.39	5.96%	1.87%	6.24%	3.338
027.31	Magnesium, AAS, Dry ash (%)	11	10	0.4386	0.1384	0.0431	0.0055	0.0434	9.00%	1.14%	9.07%	7.928
027.41	Magnesium, ICP, Dry ash (%)	14	14	0.4658	0.0203	0.0192	0.0095	0.0214	4.11%	2.04%	4.59%	2.251
027.42	Magnesium, ICP, Open vessel (%)	22	21	0.4846	0.0515	0.0234	0.0173	0.0291	4.74%	3.50%	5.89%	1.684
027.43	Magnesium, ICP, Microwave (%)	30	29	0.4844	0.0245	0.0239	0.0089	0.0255	4.94%	1.85%	5.28%	2.856
028.31	Manganese, AAS, Dry ash (ppm)	13	12	84.59	5.107	4.997	1.492	5.215	5.91%	1.76%	6.17%	3.494
028.41	Manganese, ICP, Dry ash (ppm)	13	12	84.98	3.419	3.303	1.135	3.493	3.87%	1.33%	4.10%	3.079
028.42	Manganese, ICP, Open vessel (ppm)	22	18	87.25	9.894	5.049	1.204	5.191	5.71%	1.36%	5.87%	4.313
028.43	Manganese, ICP, Microwave (ppm)	28	28	86.16	4.936	4.775	1.770	5.092	5.54%	2.05%	5.91%	2.877
031.01	Phosphorus, Photometric (%)	37	34	1.073	0.1234	0.0334	0.0203	0.0391	3.04%	1.85%	3.55%	1.923
031.41	Phosphorus, ICP, Dry ash (%)	17	17	1.064	0.0592	0.0575	0.0201	0.0609	5.40%	1.89%	5.72%	3.031
031.42	Phosphorus, ICP, Open vessel (%)	22	19	1.121	0.1086	0.0615	0.0345	0.0705	5.39%	3.02%	6.18%	2.043
031.43	Phosphorus, ICP, Microwave (%)	32	28	1.116	0.0650	0.0514	0.0211	0.0555	4.56%	1.87%	4.93%	2.634
032.31	Potassium, AAS, Dry ash (%)	9	8	1.206	0.0801	0.0751	0.0226	0.0784	6.29%	1.90%	6.57%	3.466
032.41	Potassium, ICP, Dry ash (%)	14	13	1.205	0.0784	0.0544	0.0245	0.0597	4.46%	2.01%	4.89%	2.435
032.42	Potassium, ICP, Open vessel (%)	21	20	1.294	0.1510	0.0921	0.0524	0.1060	6.98%	3.97%	8.03%	2.022
032.43	Potassium, ICP, Microwave (%)	32	30	1.280	0.0543	0.0427	0.0235	0.0487	3.35%	1.84%	3.82%	2.072
033.00	Salt as chloride, Sol Cl (%)	20	18	0.8710	0.1750	0.1098	0.0155	0.1109	12.17%	1.72%	12.29%	7.151
033.01	Salt as chloride, Poten Cl (%)	28	24	0.9663	0.0561	0.0329	0.0096	0.0343	3.44%	1.00%	3.58%	3.567
033.03	Salt as chloride, Quantab (%)	5	5	0.9410	0.1690	0.1632	0.0617	0.1745	17.35%	6.56%	18.55%	2.827
033.99	Salt, Miscellaneous (%)	7	7	0.8537	0.1993	0.1978	0.0343	0.2007	23.17%	4.02%	23.52%	5.847
034.53	Selenium, Total (Se), ICP-MS, Microwave (ppm)	8	7	0.5534	0.1059	0.1112	0.0221	0.1134	20.35%	4.04%	20.75%	5.139
035.31	Sodium, AAS, Dry ash (%)	10	8	0.5369	0.3640	0.0429	0.0049	0.0432	9.96%	1.14%	10.03%	8.787
035.41	Sodium, ICP, Dry ash (%)	15	14	0.4130	0.0184	0.0118	0.0083	0.0144	2.83%	2.00%	3.47%	1.737
035.42	Sodium, ICP, Open vessel (%)	19	16	0.4340	0.0371	0.0229	0.0065	0.0239	5.37%	1.53%	5.58%	3.649
035.43	Sodium, ICP, Microwave (%)	25	24	0.4196	0.0320	0.0169	0.0065	0.0181	3.97%	1.54%	4.26%	2.769
036.42	Sulfur, ICP, Open vessel (%)	20	17	0.5085	0.0334	0.0328	0.0139	0.0357	6.47%	2.74%	7.02%	2.565
036.43	Sulfur, ICP, Microwave (%)	21	19	0.5291	0.0331	0.0332	0.0094	0.0345	6.26%	1.78%	6.51%	3.650
037.31	Zinc, AAS, Dry ash (ppm)	13	11	225.4	45.24	20.15	4.390	20.62	9.45%	2.06%	9.67%	4.698
037.41	Zinc, ICP, Dry ash (ppm)	14	13	212.4	21.85	14.72	4.655	15.44	7.08%	2.24%	7.42%	3.317
037.42	Zinc, ICP, Open vessel (ppm)	21	19	218.5	24.08	17.70	9.318	20.00	8.02%	4.22%	9.06%	2.147
037.43	Zinc, ICP, Microwave (ppm)	30	28	214.4	16.10	14.12	4.325	14.76	6.63%	2.03%	6.93%	3.414
038.43	Molybdenum, ICP, Microwave (ppm)	10	6	1.365	0.3204	0.2019	0.0203	0.2029	13.80%	1.39%	13.87%	10.00

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
038.53	Molybdenum, ICP-MS, Microwave (ppm)	5	5	1.607	0.1429	0.1195	0.1108	0.1629	7.44%	6.89%	10.14%	1.471
105.00	Thiamine, LC (ppm)	5	5	6.225	1.392	1.361	0.4111	1.422	21.86%	6.60%	22.84%	3.458
108.02	Vitamin D3, LC (KU / kg)	6	5	0.8692	0.1593	0.0352	0.0612	0.0706	4.36%	7.58%	8.75%	1.153
109.02	Vitamin E, LC (IU / kg)	11	10	146.8	22.66	23.48	5.097	24.03	15.92%	3.46%	16.29%	4.714
120.00	Alanine, Post-col Ninhydrin Der (%)	16	16	1.706	0.0502	0.0489	0.0154	0.0513	2.87%	0.90%	3.01%	3.328
120.05	Alanine, Pre-col AQC Der (%)	10	8	1.651	0.1434	0.0925	0.0396	0.1006	5.76%	2.47%	6.26%	2.539
121.00	Arginine, Post-col Ninhydrin Der (%)	16	16	3.017	0.1150	0.1134	0.0264	0.1165	3.76%	0.87%	3.86%	4.417
121.05	Arginine, Pre-col AQC Der (%)	10	9	3.054	0.2445	0.2470	0.0664	0.2557	8.14%	2.19%	8.43%	3.854
122.00	Aspartic, Post-col Ninhydrin Der (%)	16	15	3.145	0.0557	0.0543	0.0175	0.0571	1.73%	0.56%	1.82%	3.264
122.05	Aspartic, Pre-col AQC Der (%)	10	9	3.075	0.2107	0.2029	0.0689	0.2143	6.65%	2.26%	7.02%	3.111
124.00	Cysteine/Cystine, PAO Post-col Ninhydrin Der (%)	16	15	0.9072	0.0398	0.0301	0.0109	0.0320	3.34%	1.22%	3.55%	2.924
124.05	Cysteine/Cystine, PAO Pre-col AQC Der (%)	9	8	0.7920	0.1605	0.1600	0.0171	0.1609	20.21%	2.16%	20.32%	9.422
125.00	Glutamic, Post-col Ninhydrin Der (%)	16	16	5.801	0.1471	0.1438	0.0442	0.1504	2.48%	0.76%	2.59%	3.403
125.05	Glutamic, Pre-col AQC Der (%)	10	10	5.751	0.4005	0.3876	0.1431	0.4131	6.74%	2.49%	7.18%	2.888
126.00	Glycine, Post-col Ninhydrin Der (%)	16	14	1.949	0.0325	0.0242	0.0080	0.0255	1.24%	0.41%	1.30%	3.191
126.05	Glycine, Pre-col AQC Der (%)	10	9	1.923	0.1448	0.1492	0.0273	0.1517	7.80%	1.42%	7.93%	5.566
127.00	Histidine, Post-col Ninhydrin Der (%)	16	16	0.8048	0.0376	0.0370	0.0097	0.0382	4.59%	1.20%	4.75%	3.956
127.05	Histidine, Pre-col AQC Der (%)	10	8	0.8038	0.0646	0.0587	0.0111	0.0598	7.41%	1.40%	7.54%	5.387
128.00	Isoleucine, Post-col Ninhydrin Der (%)	16	15	1.413	0.0739	0.0713	0.0134	0.0726	5.03%	0.94%	5.11%	5.422
128.05	Isoleucine, Pre-col AQC Der (%)	10	10	1.443	0.1927	0.1924	0.0151	0.1929	13.33%	1.05%	13.37%	12.79
129.00	Leucine, Post-col Ninhydrin Der (%)	16	14	2.603	0.0519	0.0535	0.0094	0.0543	2.05%	0.36%	2.09%	5.770
129.05	Leucine, Pre-col AQC Der (%)	10	10	2.532	0.1697	0.1665	0.0463	0.1728	6.58%	1.83%	6.83%	3.734
130.00	L-Lysine, Post-col Ninhydrin Der (%)	16	15	1.536	0.0520	0.0339	0.0185	0.0386	2.22%	1.21%	2.53%	2.090
130.05	L-Lysine, Pre-col AQC Der (%)	10	10	1.510	0.0778	0.0658	0.0588	0.0882	4.36%	3.89%	5.84%	1.501
130.99	L-Lysine, Miscellaneous (%)	5	5	1.563	0.2707	0.2642	0.0831	0.2770	16.91%	5.32%	17.72%	3.334
131.00	Methionine, PAO Post-col Ninhydrin Der (%)	16	14	0.4871	0.0333	0.0253	0.0061	0.0260	5.28%	1.28%	5.43%	4.259
131.05	Methionine, PAO Pre-col AQC Der (%)	10	8	0.4698	0.0618	0.0648	0.0053	0.0650	13.90%	1.14%	13.95%	12.20
132.00	Phenylalanine, Post-col Ninhydrin Der (%)	16	15	1.827	0.0591	0.0406	0.0208	0.0456	2.21%	1.13%	2.48%	2.193
132.05	Phenylalanine, Pre-col AQC Der (%)	10	9	1.802	0.1887	0.1150	0.0436	0.1230	6.56%	2.48%	7.01%	2.824
133.00	Proline, Post-col Ninhydrin Der (%)	16	14	2.153	0.1398	0.1151	0.0199	0.1168	5.40%	0.93%	5.48%	5.864
133.05	Proline, Pre-col AQC Der (%)	10	10	2.197	0.1941	0.1900	0.0557	0.1980	8.65%	2.53%	9.01%	3.556
134.00	Serine, Post-col Ninhydrin Der (%)	16	15	2.315	0.0987	0.0645	0.0245	0.0690	2.76%	1.05%	2.96%	2.812
134.05	Serine, Pre-col AQC Der (%)	10	8	2.285	0.3190	0.1481	0.0514	0.1567	6.28%	2.18%	6.65%	3.048
135.00	Threonine, Post-col Ninhydrin Der (%)	16	13	1.401	0.0435	0.0293	0.0107	0.0312	2.08%	0.76%	2.21%	2.915
135.05	Threonine, Pre-col AQC Der (%)	10	8	1.375	0.1684	0.1006	0.0243	0.1035	7.08%	1.71%	7.28%	4.257
136.03	Tryptophan, Alka-Hydrol + IS RP LC FI (%)	8	8	0.4367	0.0318	0.0317	0.0036	0.0319	7.25%	0.83%	7.30%	8.747
137.00	Tyrosine, Post-col Ninhydrin Der (%)	13	11	1.066	0.0951	0.0928	0.0082	0.0932	8.79%	0.77%	8.82%	11.40
137.05	Tyrosine, Pre-col AQC Der (%)	9	7	1.100	0.2046	0.1134	0.0145	0.1143	10.92%	1.40%	11.01%	7.868
138.00	Valine, Post-col Ninhydrin Der (%)	16	14	1.899	0.1163	0.1042	0.0142	0.1052	5.45%	0.74%	5.50%	7.426
138.05	Valine, Pre-col AQC Der (%)	10	10	1.898	0.1717	0.1685	0.0467	0.1748	8.88%	2.46%	9.21%	3.742
400.01	Water Activity, Aqualab chilled mirror (Units)	14	13	0.5015	0.0379	0.0268	0.0064	0.0275	5.42%	1.29%	5.57%	4.324
520.43	Chromium, Total (Cr), ICP, Microwave (ppm)	7	6	3.024	0.8327	0.8326	0.0192	0.8328	27.53%	0.63%	27.54%	43.46

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