

# NRC – EGGS-1

## SUMMARY

The application note summarizes the digestion of EGGS-1, an egg powder Reference Material using ColdBlock™ Digestion Pro Series Technology.

<b>Instrument:</b>	ColdBlock CBM sample digester, chiller, Quartz vessels, ICP-MS & ICP-OES
<b>Published:</b>	March 2023
<b>Digestion Time:</b>	20 Minutes
<b>Acid Used:</b>	HNO <sub>3</sub> & H <sub>2</sub> O <sub>2</sub>
<b>Average ColdBlock Recovery vs. CRM:</b>	<ul style="list-style-type: none"><li>■ 107% Chromium</li><li>■ 113% Lead</li><li>■ 101% Selenium</li></ul>

## METHODOLOGY

1. Chiller temperature was set to -5°C
2. 0.5g of each sample was weighed and placed into a ColdBlock™ Digestion vessel
3. 15 mL of Nitric acid was added
4. Sample was digested at 70% power for 15 minutes
5. 2mL of 30% <sub>v/v</sub> Hydrogen Peroxide was added
6. Samples were digested again at 70% power for 5 minutes
7. Samples were cooled and bulked to 40mL using 2% HNO<sub>3</sub> + 0.5% HCl <sub>v/v</sub>

## DISCUSSION

- The samples were slightly opaque at the end of the digestion and some of the lipid component remains in solution



Figure 1 EGGS-1 after bulk up

EGGS-1 is a reference material prepared from Canada Grade A dried whole egg powder. EGGS-1, National Research Council Canada, Measurement Science and Standards, Ottawa, Ontario Canada, September, 2015

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## Results

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Method:	0.5g	15mL HNO <sub>3</sub> – Digest at 70% power for 15 minutes, add 2mL H <sub>2</sub> O <sub>2</sub> and digest again at 70% power for 5 minutes									
Element	Reference Values (ppm)	+/-	95% Confidence Limits		Sample A	Sample B	Sample C	Average (ppm)	Stdev	% RSD	% Recovery
			Low	High							
Al	540	86	454	626	580	516	553	549	26	4.8%	102%
Ca	2480	190	2290	2670	2699	2227	2376	2434	197	8.1%	98%
Cr	0.37	0.18	0.19	0.55	0.43	0.42	0.34	0.4	0.04	10.2%	107%
Co	0.012	0.005	0.007	0.017	0.013	0.013	0.015	0.014	0.001	6.9%	114%
Cu	2.7	0.35	2.35	3.05	2.8	2.7	2.8	2.8	0.02	0.6%	102%
Fe	112	16	96	128	115	108	110	111	3	2.8%	99%
Pb	0.061	0.012	0.049	0.073	0.064	0.074	0.069	0.07	0.004	5.9%	113%
Mg	305	27	278	332	309	303	307	306	3	0.9%	100%
Mn	1.78	0.38	1.4	2.16	2.07	2.01	1.75	1.943	0.14	7.1%	109%
Mo	0.247	0.023	0.224	0.27	0.239	0.295	0.249	0.261	0.024	9.3%	106%
P	10001	320	9681	10321	9734	9419	10079	9744	270	2.8%	97%
K	3190	370	2820	3560	3359	3099	3292	3250	110	3.4%	102%
Se	1.39	0.17	1.22	1.56	1.38	1.33	1.50	1.4	0.07	5.1%	101%
Na	3770	340	3430	4110	3867	3810	4065	3914.0	109	2.8%	104%
Sr	5.63	0.46	5.17	6.09	5.08	5.36	6.08	5.5	0.42	7.6%	98%
V	0.459	0.081	0.378	0.54	0.524	0.516	0.513	0.5	0.005	0.9%	113%
Zn	67.5	7.6	59.9	75.1	64.0	66.4	69.7	66.7	2.3	3.5%	99%