

NRC BOVM-1 Bovine Muscle

SUMMARY

The application note summarizes the digestion of BOVM-1, a Bovine Muscle Certified Reference Material using ColdBlock™ Digestion Pro Series Technology.

Instrument: ColdBlock CBM sample digester, chiller, ICP-MS & ICP-OES

Published: March 2023

Digestion Time: 10 Minutes

Acid Used: HNO₃ & H₂O₂

Average ColdBlock Recovery vs. CRM:

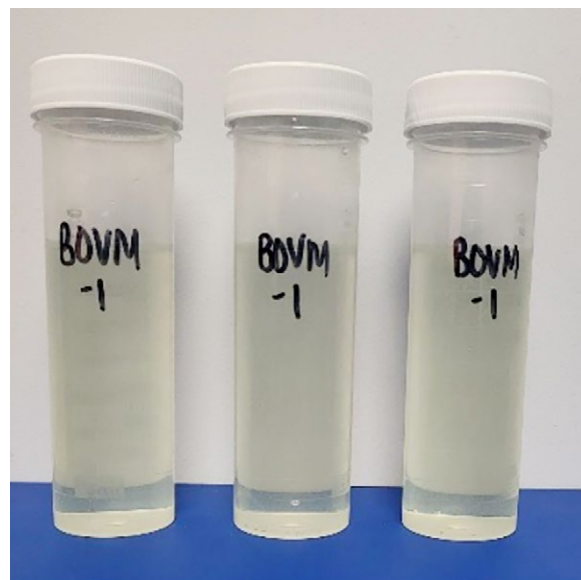
- 111% Arsenic
- 97% Cadmium
- 96% Lead

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 HNO₃ + 2mL H₂O₂ was added
4. Sample were digested at 60% power for 10 minutes
5. Samples were cooled and bulked to 40mL using 2% HNO₃ + 0.5% HCl_{v/v}

DISCUSSION

- Digestions were mostly clear with a minor amount of suspended lipids
- Samples were filtered prior to analysis



BOVM-1 is a CRM prepared from Canada Grade A beef. The source of material was boneless hip, commonly denoted Canada Grade A round steak (consisting of 4 major muscles: semi-membranous, semi-tendinosus, biceps femoris and adductor).

BOVM-1, Bovine Muscle, National Research Council Canada, Ottawa, Ontario Canada, September 2015.

NRC BOVM-1 Bovine Muscle

Results

BOVM-1 Bovine Muscle										
Method:	0.5g	15mL HNO ₃ + 2mL H ₂ O ₂ Digest at 60% power for 10 minutes.								
Element	Reference Value (ppm)	95% Confidence Limits		Sample A	Sample B	Sample C	Average (ppm)	Stdev	% RSD	% Recovery
		Low	High							
Al	1.7	N/A	N/A	1.5	1.6	1.9	1.7	0.164	9.8%	98%
As	0.009	0.006	0.012	0.009	0.01	0.011	0.01	0.001	8.2%	111%
B	0.6	0.2	1	0.7	0.5	0.6	0.6	0.049	8.2%	100%
Ca	145	125	165	168	159	145	157	9.636	6.1%	109%
Cd	0.013	0.002	0.024	0.012	0.012	0.014	0.013	0.001	7.4%	97%
Co	0.007	0.004	0.01	0.006	0.006	0.008	0.007	0.001	14.4%	96%
Cr	0.071	N/A	N/A	0.069	0.072	0.08	0.073	0.003	4.5%	102%
Cu	2.84	2.39	3.29	3.08	2.73	2.41	2.74	0.274	10.0%	96%
Fe	71.2	62	80.4	74.7	72.9	73.0	73.5	0.838	1.1%	103%
K	15200	14800	15600	14992	14873	14744	14870	101.352	0.7%	98%
Mg	960	865	1055	970	956	924	950	19.253	2.0%	99%
Mn	0.37	0.28	0.46	0.39	0.35	0.40	0.38	0.022	5.7%	103%
Mo	0.08	0.02	0.14	0.07	0.08	0.08	0.08	0.002	2.2%	94%
Na	2100	2000	2200	2156	2147	2105	2136	22.038	1.0%	102%
P	8360	7910	8810	7981	8137	8087	8068	65.229	0.8%	97%
Pb	0.38	0.14	0.62	0.35	0.36	0.38	0.36	0.012	3.4%	96%
Rb	28.7	25.2	32.2	31.1	25.6	26.1	27.6	2.491	9.0%	96%
S	8000	N/A	N/A	7184	7371	7331	7295	80.143	1.1%	91%
Sb	0.01	N/A	N/A	0.01	0.01	0.01	0.01	0.000	4.6%	103%
Se	0.076	0.066	0.086	0.08	0.07	0.09	0.08	0.006	7.0%	104%
Sr	0.052	0.037	0.067	0.057	0.061	0.061	0.06	0.002	3.2%	115%
Zn	142	128	156	140	149	137	142	4.734	3.3%	100%