

NIST 1546a – Meat Homogenate

SUMMARY

The application note summarizes the digestion of NIST 1546a, a meat homogenate standard reference material using ColdBlock™ Digestion Pro Series Technology.

Instrument: ColdBlock CBM (with quartz test tubes), chiller, ICP-MS

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Digestion Time: 20 Minutes

Acid Used: HNO₃ & H₂O₂

Average ColdBlock Recovery vs. CRM:

- 102% Copper
- 104% Iron
- 105% Selenium

METHODOLOGY

1. Chiller temperature was set to -5°C
2. 0.5g of each sample was weighed and placed into a quartz ColdBlock™ Digestion vessel
3. 10 mL of HNO₃ was added and mixed with the sample
4. Sample was digested at 65% power for 20 minutes
5. 2mL of ≥ 30% H₂O₂ was added
6. Samples were cooled and bulked to 40mL using 2% HNO₃ v/v

DISCUSSION

- Samples were digested in triplicate
- Samples were filtered prior to analysis by ICP-MS
- H₂O₂ (Sigma Aldrich 95321, Hydrogen peroxide solution ≥30%, for trace analysis)
- HNO₃ (Analytichem, 250-038-175, Nitric Acid, PP, 67-70%)
- NIST 1546a consists of a mixture of pork and chicken products blended in a commercial process



NIST 1546a after bulk-up to 40mL

NIST 1546a – Meat Homogenate

Results

NIST 1546a – Meat Homogenate										
Method:	0.5g	10mL HNO ₃ digested at 65% power for 20 minutes, then added 2mL H ₂ O ₂ , let cool and bulked to 40mL with 2% HNO ₃ v/v								
Element	NIST Certified Values (mg/kg)	95% Confidence Limits		Sample A	Sample B	Sample C	Average (mg/kg)	Stdev	% RSD	% Recovery
		Low	High							
Cu	0.605	0.554	0.656	0.671	0.532	0.656	0.620	0.062	10.1%	102%
Fe	10.17	9.82	10.52	9.86	11.06	10.29	10.40	0.50	4.8%	102%
Mg	178.1	173.3	182.9	186.6	160.8	169.3	172.2	10.8	6.2%	97%
Mn	0.286	0.262	0.31	0.272	0.257	0.270	0.266	0.007	2.5%	93%
P	1651	1619	1683	1583	1681	1806	1690	92	5.4%	102%
K	2490	2280	2700	2409	2720	2536	2555	128	5.0%	103%
Se	0.281	0.264	0.298	0.273	0.308	0.303	0.295	0.015	5.2%	105%
Na	9600	8500	10700	9677	8931	9562	9390	328	3.5%	98%
Zn	17.88	17.53	18.23	18.94	17.29	18.39	18.21	0.69	3.8%	102%
*Ba	0.077	0.058	0.096	0.078	0.071	0.065	0.071	0.005	7.4%	93%
*B	0.306	0.267	0.345	0.257	0.273	0.310	0.280	0.022	7.9%	92%
*Ca	360	230	490	334	439	366	378	44	11.6%	105%
*Mo	0.016	0.014	0.018	0.014	0.017	0.017	0.016	0.001	8.8%	100%
*Rb	2.56	2.45	2.67	2.57	2.81	2.42	2.60	0.16	6.2%	102%
*Sr	0.305	0.235	0.375	0.309	0.368	0.317	0.331	0.03	7.9%	109%

* Non-Certified Values