

Electronic Supplementary Information

A simplified protocol for measurement of Ca isotopes in biological samples

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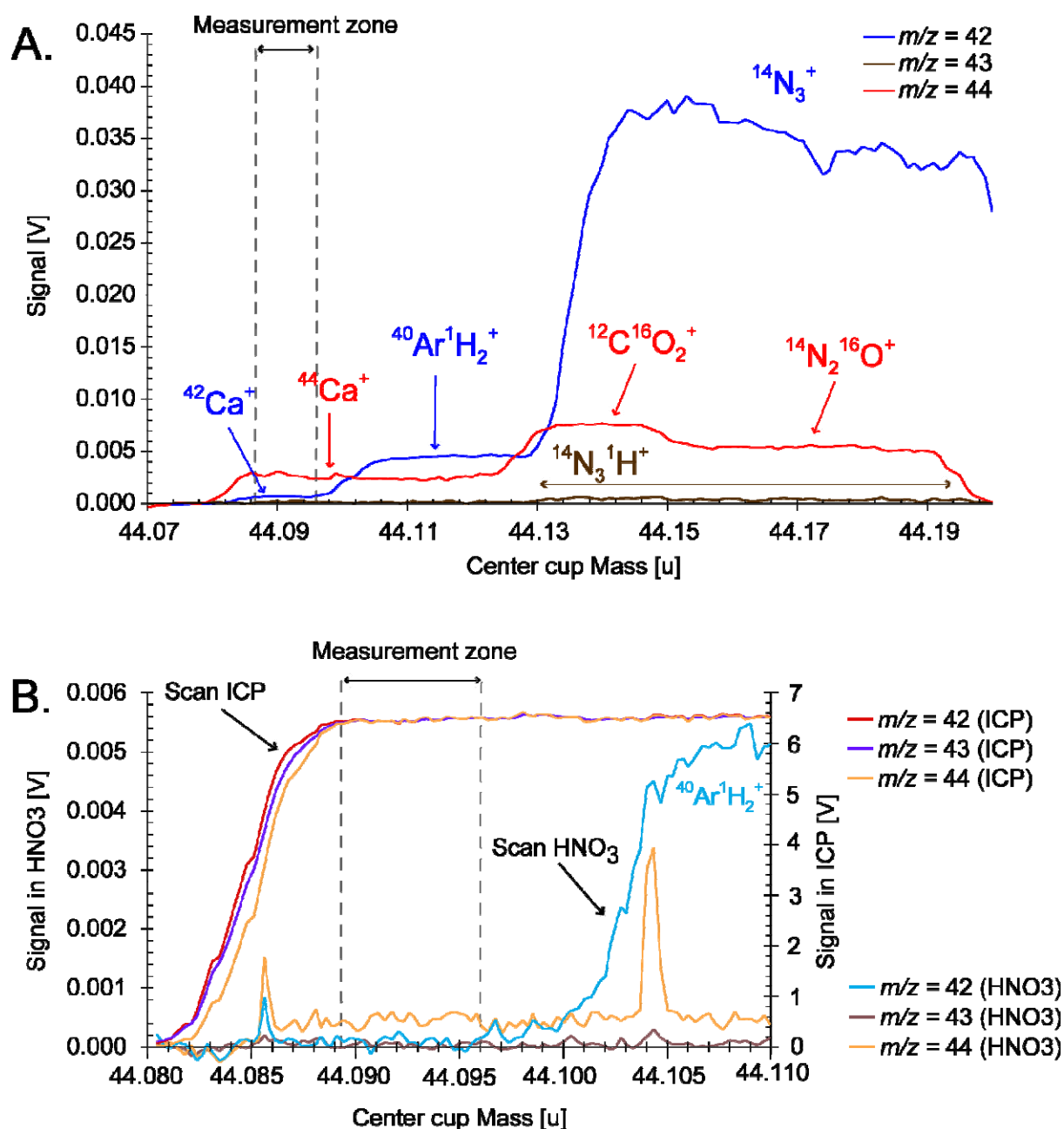


Figure S1 A and B: Mass scans centered on central cup with a global view of polyatomic interferences in 0.05 N HNO₃ (A) and a zoom in on measurement zone (B) with signals corresponding to 0.05 N HNO₃ and to ICP Ca standard. Interfering species are noted next to each interference peak. Calcium isotope measurements were carried out between the left side of Ca peak and $^{40}\text{Ar}^1\text{H}_2^+$ growing interference on the right side of 42 signal, as delimited by the dotted lines.

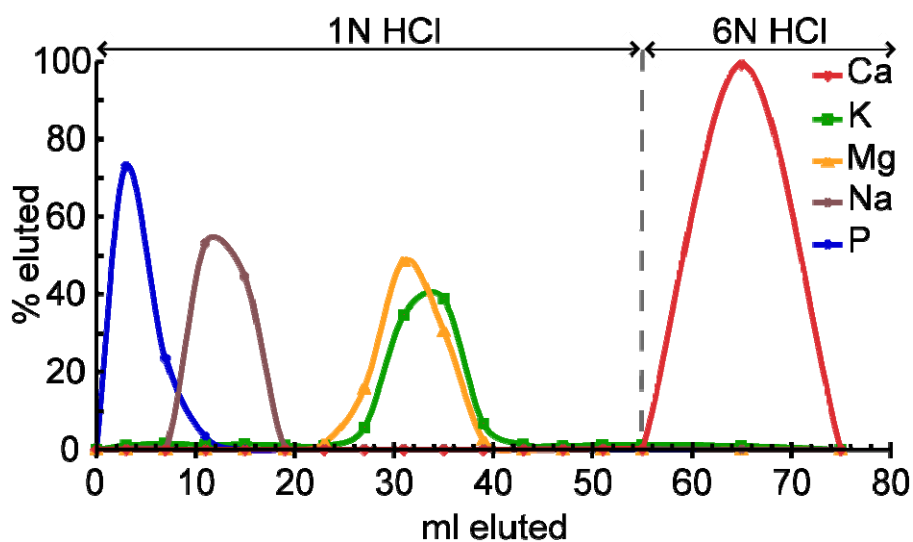


Figure S2: **Elution profiles on AG50W-X12 columns for sheep serum.** Each curve represents the massic percentage of eluted element as a function of introduced eluent volume.

	Indiv.	Material	<i>n</i>	$\delta^{44/42}\text{Ca}$ ‰ p.amu	$\delta^{43/42}\text{Ca}$ ‰	$\delta^{44/43}\text{Ca}$ ‰	43.5/44	[Ca] ppm
Standards	/	SRM915b	11	-0.06 ± 0.04	-0.07 ± 0.05	-0.06 ± 0.04	1.1E-06	400100 ²
	/	SRM1486	17	-0.48 ± 0.07	-0.47 ± 0.09	-0.48 ± 0.07	1.8E-06	265800 ²
	/	Seawater	2	0.21 ± 0.03	0.19 ± 0.03	0.22 ± 0.03	3.3E-06	420
	/	CBE	9	-0.52 ± 0.03	-0.53 ± 0.07	-0.52 ± 0.03	2.3E-06	400000 ¹
Diet	/	FM1	2	-0.08 ± 0.16	-0.08 ± 0.30	-0.10 ± 0.05	2.4E-06	5379
	/	FM2	2	-0.15 ± 0.08	-0.22 ± 0.06	-0.12 ± 0.07	3.0E-06	6429
	/	FM3	4	-0.09 ± 0.07	-0.09 ± 0.22	-0.08 ± 0.05	4.9E-06	4350
Red blood cells	A	RBC9125	2	-0.05 ± 0.11	-0.05 ± 0.29	-0.05 ± 0.03	5.7E-06	77
	C	RBC9351	2	0.08 ± 0.05	0.15 ± 0.06	0.01 ± 0.06	1.6E-06	78
	D	RBC9646	2	0.06 ± 0.02	0.01 ± 0.11	0.11 ± 0.04	3.5E-06	88
Serum	A	Ser9125	2	-0.27 ± 0.05	-0.31 ± 0.08	-0.23 ± 0.04	3.3E-05	1185
	B	Ser9169	2	-0.27 ± 0.13	-0.34 ± 0.11	-0.20 ± 0.07	5.0E-05	1083
	C	Ser9351	2	-0.30 ± 0.04	-0.37 ± 0.04	-0.24 ± 0.09	8.8E-06	1051
	D	Ser9646	2	-0.26 ± 0.05	-0.35 ± 0.06	-0.26 ± 0.05	8.3E-05	1003
Bone	A	SB9125	2	-0.27 ± 0.14	-0.32 ± 0.08	-0.26 ± 0.08	4.5E-06	400000 ¹
	B	SB9169	2	-0.36 ± 0.01	-0.37 ± 0.02	-0.40 ± 0.06	3.8E-07	400000 ¹
	C	SB9351	2	-0.37 ± 0.18	-0.37 ± 0.02	-0.36 ± 0.10	3.6E-07	400000 ¹
	D	SB9646	2	-0.27 ± 0.01	-0.29 ± 0.15	-0.28 ± 0.03	1.1E-06	400000 ¹
Enamel	A	E9125	2	-0.42 ± 0.10	-0.43 ± 0.23	-0.37 ± 0.04	2.2E-07	400000 ¹
	D	E9646	8	-0.46 ± 0.10	-0.46 ± 0.13	-0.46 ± 0.10	2.1E-06	400000 ¹
	Other	E1634	5	-0.56 ± 0.03	-0.56 ± 0.07	-0.56 ± 0.03	2.3E-06	400000 ¹
Kidney	A	SK9125	4	-0.23 ± 0.16	-0.24 ± 0.15	-0.23 ± 0.04	2.9E-06	356
	B	SK9169	2	-0.25 ± 0.09	-0.35 ± 0.07	-0.20 ± 0.06	2.6E-06	459
	C	SK9351	2	-0.21 ± 0.04	-0.21 ± 0.13	-0.25 ± 0.00	3.9E-07	328
	D	SK9646	2	-0.14 ± 0.07	-0.09 ± 0.04	-0.17 ± 0.01	4.2E-06	385
Urine	Other	SU9172	1	0.26 ± 0.06	0.20 ± 0.10	0.33 ± 0.05	3.2E-05	14.3
	Other	SU9414	2	0.03 ± 0.05	-0.02 ± 0.20	0.07 ± 0.03	9.5E-06	5.4
Muscle	A	LD9125	2	0.12 ± 0.10	0.05 ± 0.01	0.18 ± 0.06	8.4E-06	115
	B	LD9169	2	-0.22 ± 0.15	-0.19 ± 0.18	-0.25 ± 0.11	6.1E-06	178
	C	LD9351	2	-0.18 ± 0.07	-0.20 ± 0.05	-0.14 ± 0.06	3.8E-06	127
Liver	B	SL9169	1	-0.21 ± 0.06	-0.21 ± 0.10	-0.20 ± 0.05	7.1E-05	136
	C	SL9351	4	0.52 ± 0.11	0.52 ± 0.23	0.52 ± 0.11	3.4E-06	123
	D	SL9646	1	0.28 ± 0.06	0.22 ± 0.10	0.32 ± 0.05	8.7E-05	126
Feces	A	F9125	2	-0.14 ± 0.07	-0.20 ± 0.15	-0.10 ± 0.04	9.9E-06	26632
	B	F9169	1	-0.09 ± 0.06	-0.12 ± 0.10	-0.10 ± 0.05	2.0E-06	42054
	D	F9646	2	-0.15 ± 0.04	-0.11 ± 0.00	-0.17 ± 0.03	1.1E-06	26034

Table S1: Isotopic compositions with respect to ICP Ca standard for all analyzed materials, including standards and sheep samples. For each material, *n* is the number of spectrometric measurements. When *n*=1, 2SD errors correspond to average 2SD errors on standard measurements. 43.5/44 ratio is the ratio of ⁸⁷Sr²⁺ and ⁴⁴Ca signals for each measurement. Concentrations were measured in freeze-dried samples, except for urine and seawater, measured in wet samples. ¹ Ca concentrations are stoichiometric concentrations of Ca from hydroxyapatite. ² Ca concentrations are certified values from NIST.