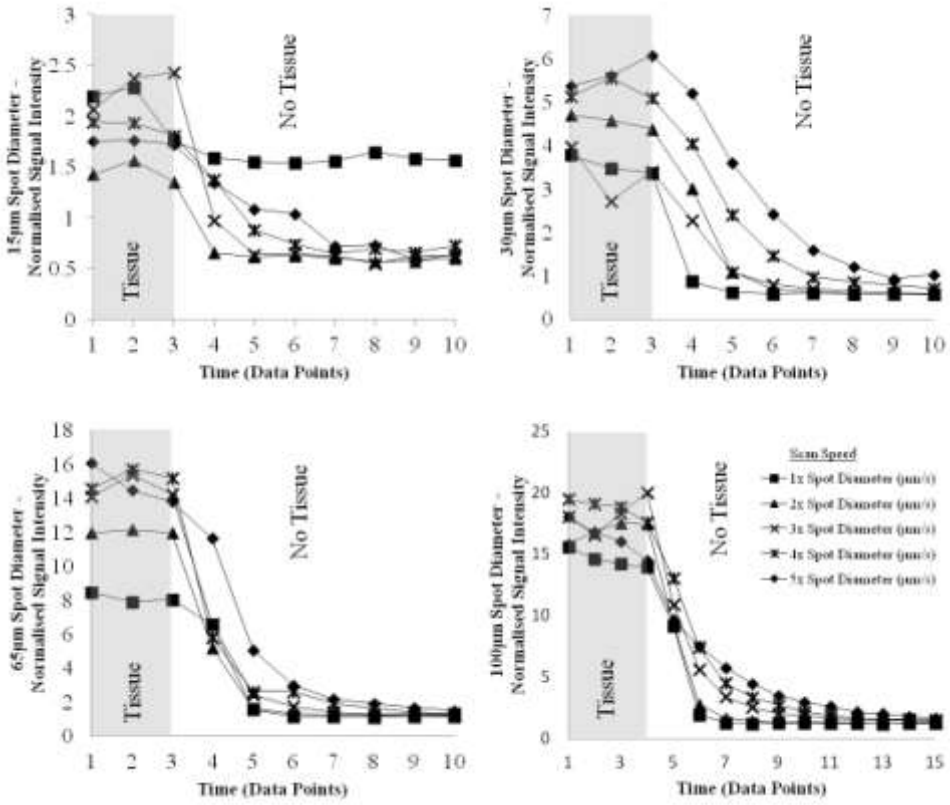
Supplementary Table 1: Concentrations (± standard deviation) of each isotope in prepared tissue standards

		Calibration Standard							
		Blank	A	B	C	D	E	F	G
Concentration ± Standard Deviation (ug g^{-1})	^{24}Mg	339.48 ± 15.21	349.01 ± 15.78	354.32 ± 10.95	363.75 ± 11.96	388.79 ± 9.94	409.38 ± 9.6	417.33 ± 10.01	417.65 ± 6.27
	^{55}Mn	0.15 ± 0.03	4.52 ± 0.18	1.02 ± 0.03	5.32 ± 0.17	10.51 ± 0.37	17.16 ± 0.4	23.80 ± 0.35	26.86 ± 0.69
	^{56}Fe	4.79 ± 0.69	9.94 ± 0.48	27.86 ± 2.17	50.61 ± 1.79	88.38 ± 2.45	129.30 ± 4.36	162.42 ± 3.62	187.98 ± 6.12
	^{57}Fe	4.61 ± 0.80	9.14 ± 0.41	26.78 ± 2.24	48.95 ± 1.63	87.09 ± 3.00	128.32 ± 4.57	160.64 ± 3.01	186.10 ± 5.96
	^{59}Co	0.00 ± 0.03	1.71 ± 0.11	10.28 ± 0.36	19.51 ± 0.65	44.13 ± 2.16	73.73 ± 1.55	94.87 ± 1.544	100.20 ± 5.57
	^{60}Ni	0.00 ± 0.11	2.34 ± 0.94	10.20 ± 0.67	18.01 ± 0.90	40.92 ± 1.66	65.38 ± 1.17	84.72 ± 1.04	91.56 ± 3.92
	^{63}Cu	0.19 ± 0.12	2.20 ± 0.13	7.40 ± 0.24	14.22 ± 0.43	25.79 ± 1.05	59.07 ± 2.36	67.65 ± 0.87	80.32 ± 1.85
	^{66}Zn	4.55 ± 1.04	11.10 ± 0.35	17.89 ± 0.46	33.14 ± 1.06	61.48 ± 1.24	93.19 ± 2.55	115.66 ± 1.43	130.04 ± 4.95
	^{85}Rb	6.75 ± 0.14	9.46 ± 0.19	19.74 ± 0.46	32.58 ± 0.98	58.41 ± 2.66	93.87 ± 1.59	123.64 ± 2.47	140.08 ± 4.22
	^{88}Sr	0.00 ± 0.01	1.69 ± 0.07	3.41 ± 0.12	9.14 ± 0.31	13.00 ± 0.78	19.34 ±0.42	30.35 ± 0.5	33.26 ± 0.58

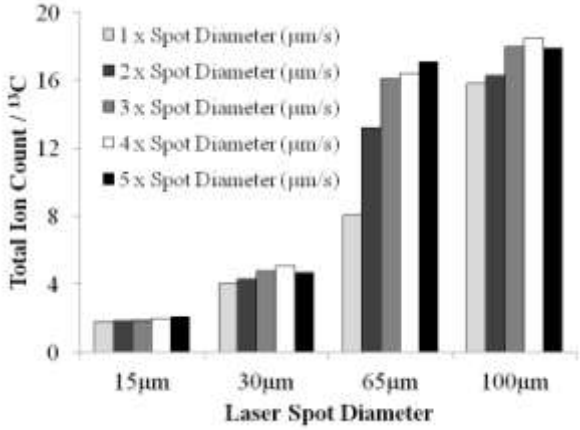
Supplementary Table 2: Calculated minimum dwell times for each element in the prepared chicken standards

m/z	**Selected minimum MS Dwell Times (seconds)**
13	0.010
24	0.005
31	0.001
44	0.005
55	0.005
56	0.015
57	0.090*
59	0.010
60	0.300*
63	0.020
66	0.005
85	0.001
88	0.005

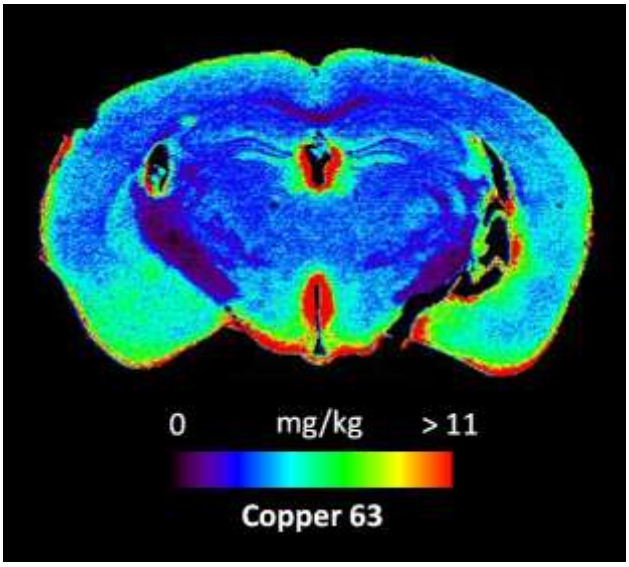
* Did not pass the limiting signal and are therefore not quantifiable, but are above limit of detection



Supplementary Figure 1: Washout times - time taken (in data points) for total ion count (TIC) to reach background levels after tissue ablation using increasing scan speeds



Supplementary Figure 2: Comparison of normalised signal intensities for the total ion count (TIC) across laser spot diameters and increasing scan speed



Supplementary Figure 3: Demonstration of the use of increased v_l while maintaining image dimensions equivalent to the original tissue section. x_s = 30µm, t_{sc} = 0.2372 seconds = v_l of 127µms^{-1}