**Supporting Information**

**Method S1. Description of protocols employed for tooth sectioning and stable isotope measurements**

**Analytical Methods**

      Each molar was cut in half using a wet saw and tooth enamel was removed using a Dremmel Drill. The samples were then immersed in 8mL of 0.8M HCl acid and stored at 4°C for circa three to five weeks during which the acid was replaced every two days. Once the demineralisation process was complete, samples were rinsed in distilled water and cut into 1mm long horizontal sections, from the cusp to the apex of the tooth. Each section was covered by 8ml of pH=3 water and placed on a heating block at 80°C for 48 hours. Gelatinized collagen was not filtered to maximize its yield and the samples were freeze dried. Duplicate samples of collagen (0.9–1.1mg) from each section were weighed into tin capsules.  These were isotopically analysed using a Sercon 20-22 continuous flow isotope ratio mass spectrometer coupled to a Sercon GSL elemental analyzer at the University of York. Accuracy was determined by measurements of international standard reference materials within each analytical run. These were IAEA 600 δ13Craw = -27.45 ±0.06 ‰, δ13Ctrue = -27.77 ±0.043 ‰, δ15Nraw = 0.76 ±0.07 ‰, δ15Ntrue = 1 ±0.2 ‰; IAEA N2 δ15Nraw = 20.2 ±0.09 ‰, δ15Ntrue = 20.3 ±0.2 ‰; IA Cane, δ13Craw = -11.8 ±0.07 ‰; δ13Ctrue = -11.64 ±0.03 ‰. The overall uncertainties on the measurements of each sample were calculated based on the method of Kragten (1994) by combining uncertainties in the values of the international reference materials and those determined from repeated measurements of samples and reference materials. These are expressed as one standard deviation. The maximum uncertainty for all samples across all runs was ≤ 0.2 ‰ for both carbon and nitrogen stable isotopes stable isotopes. In addition, a homogenised bovine bone extracted and analysed within the same batch as the samples produced the following average values; δ13C = -23.19 ±0.20 δ15N = 6.46 ±0.05. This was within the overall mean value from 50 separate extracts of this bone sample, which produced values of δ13C = -23.21 ±0.20 and δ15N = 6.22 ±0.27. Isotopic results are reported using delta notation relative to the international standards VPDB and AIR for carbon (δ13C) and nitrogen (δ15N) stable isotopes, respectively.

Each section is identified by a concatenate string merging individual’s ID (e.g. BN124), type of tooth (e.g. M1) and an increment identified by a single letter code following alphabetical order (e.g. BN124-M1-G). If increments were combined to provide an isotopic measurement, the mix is represented by concatenating the corresponding letter codes (e.g. BN124-M1-A+B).

**Reference**

Kragten J. 1994. Tutorial review. Calculating standard deviations and confidence intervals with a universally applicable spreadsheet technique. *Analyst* **119**: 2161-2165. DOI: 10.1039/AN9941902161