**Supplementary text: Archaeological maize and cooking experiments for δ13C references**

Pottery sherds were collected as part of the FONDECYT Project N°11150397: “Trayectoria socio-política y complejización en la Araucanía septentrional: El Complejo El Vergel en la región de Angol (1000-1550 d.C.)” led by the archaeologist Dr. Roberto Campbell. Samples were shipped from Chile under the permit ORD N° 2477 issued by the National Monuments Council of Chile.

**Archaeological maize references for δ13C**

Archaeological maize references were a contribution by the FONDECYT project Nº 1181829 titled *Monumentos arqueológicos y memorias materiales: Historias andinas de larga duración en Pampa Iluga, Tarapacá (900 a.C.-1600 d.C.*), led by Professor Mauricio Uribe. Archaeological maize kernels were recovered from a specific mound from Iluga Túmulos site, Tarapacá Region, Chile. Samples were shipped from Chile under the decree CVE 2292672 issued by the Ministry of Cultures, Arts and Heritage of Chile.

Maize kernels were grouped according to their stratigraphic layer of origin, resulting in 5 groups (Supplemental Table 3). A pestle and mortar was cleaned using dichloromethane before and after crushing each group of maize kernels.

Lipids were extracted following a one-step acidified methanol protocol as in [Craig and others (2013).](https://paperpile.com/c/0qBVnq/n3lm+O679) Lipids were diluted and analysed using gas-chromatography-combustion-ratio mass spectrometry to obtain maize δ13C stable isotope references.

**Cooking experiments**

Cooking experiments were conducted at the YEAR Centre, University of York, York, United Kingdom, and in an open area in Concepción, Bío Bío Region, Chile to obtain reference for δ13C stable isotopes and molecular data for ⍵-(o-alkylphenyl) alkanoic acid and phytanic acid from plant and animal products (Supplemental Table 4).

Replica vessels were used according to Bondetti and others (2020). Pots were rinsed with Dichloromethane (DCM) to eliminate any exogenous organic contamination before each cooking event.

Embers from intensely heated coal and wood were used as a heat source. Vessels were placed on the embers. Animal and plant products were put into a specific pot; no mixing of products was conducted during these experiments. Vessels were filled with deionized water until the products were completely covered, refilling when the water evaporated. Each cooking event lasted *ca.* 30 to 60 min. Cooking events were repeated ca. 7 times in each vessel by adding more product and refilling the pots with water. Temperature was monitored during the cooking events by using a distance thermometer.

Lipids from the replica vessels followed a one-step acidified methanol protocol as in Craig and others (2013).

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