

## Monitoring Dairy Consumption in Humans using Calcium isotopes

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The increase in dietary intake of domesticated animal dairy products by human populations during the Neolithic Revolution, played a central – but yet debated – role in the dynamics of demographic transitions and the expansion of Neolithic economies. However, no direct method exists to reconstruct the effective consumption of dairy products by populations. Calcium isotopes are potentially such a tool<sup>[1]</sup> but a first assessment led to inconclusive results<sup>[2]</sup>.

In this study, we reassessed the sensitivity of Ca isotopes to dietary intake of dairy products. Using available datasets and newly acquired data on Ca dietary sources, we present a comprehensive mixing model for the  $\delta^{44/42}\text{Ca}$  distributions of total diet as a function of the proportion of Ca from dairy products. These results are compared to human bone  $\delta^{44/42}\text{Ca}$  values from prehistorical and historical European and Oceanian populations, representing groups consuming varying proportions of Ca from dairy products.

The model predicts a strong relationship between  $\delta^{44/42}\text{Ca}$  of total diet and the proportion of Ca from dairy products. This result is confirmed by the observed significant differences between populations according to their dietary habits regarding dairy products. We stress that Ca isotopes have the potential to monitor the intensification of dairy products consumption across prehistoric and historic periods.

<sup>[1]</sup> Chu et al. (2006), *Applied Geochemistry*, 21, 10, p.p. 1656-1667.; <sup>[2]</sup> Reynard et al., (2011) *Journal of Archaeological Science*, 38, 3, p.p. 657-664.