

**MA Thesis – Human Skeletal Biology Track, Physical Anthropology - New York University
(2013)**

**ASSESSING EVIDENCE OF WEANING AND CLIMATE EXTREMES IN
INCREMENTAL MICROSAMPLES OF HUMAN DENTIN COLLAGEN
FROM MALAWI: A STABLE ISOTOPE ANALYSIS**

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Abstract

Isotope geochemistry is frequently used in archaeological contexts to reconstruct diet and mobility. Using stable carbon and nitrogen isotopes, I assessed infant-feeding practices and the visibility of documented environmental stressors that impacted food security for six individuals from a contemporary Malawian skeletal assemblage. Dentin collagen from first and second permanent mandibular molars were sequentially microsampled to construct a dietary record from birth to approximately fifteen years. Results were contextualized using life history information obtained for each decedent and data relating to health, diet, and environmental crises in Malawi.

Enriched $\delta^{15}\text{N}$ and $\delta^{13}\text{C}$ values suggest breast milk consumption between birth and age 1. An early weaning signal appears between the ages of 1 and 2.5 years. Stable isotope results are consistent with documented weaning practices in Malawi. Preliminary associations between stable isotope values in dentin collagen and documented climatological events are noted for three of the six individuals – decedent 28-08 (years: 1978-1981), 218-11 (years: 1949-1950), and 220-11 (years: 1997-2004). While $\delta^{15}\text{N}$ values are consistent with natural idiosyncratic variation, $\delta^{13}\text{C}$ values decreased by approximately 2‰ in dentin microsamples formed concurrent with or subsequent to climatic extremes. I propose that changes in diet in response to food insecurities, including C_3 -resource supplementation and food importation, may be responsible for these signals. I also suggest that climatological events with associated dietary changes require a prolonged duration if stable isotope variations are to be visible in non-remodeling skeletal tissues that formed during childhood. The stable isotope results obtained from this modern human skeletal assemblage with known life history speak to the inferences that can be made regarding dietary changes and environmental stressors when drawing upon skeletal remains from the archaeological record.