

To be a maize farmer, or not to be a maize farmer...

ABSTRACT: Despite all we've learned about the benefits of a hunting-gathering way of life, the view that agriculture is inherently superior to hunting-gathering remains. Thus, there is a perpetual question concerning those people who did not invest in agricultural production - particularly if it is clear that they knew about it! This research explores the distribution of archaeological evidence for maize cultivation across both North and South America using environmental and hunter-gatherer frames of reference to isolate the conditions under which hunter-gatherers, faced with the possibility of adopting maize cultivation, choose to be or not to be a maize farmer.

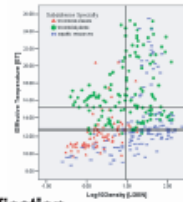
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UNDER WHAT CONDITIONS DO HUNTER-GATHERERS INTENSIFY ON PLANTS?

Hunter-gatherers are dominantly dependent on terrestrial plants when Effective Temperature (ET) is greater than 12.75 (Binford's plant threshold).

Density-dependent shifts in subsistence strategies are evident among hunter-gatherers at a population density of only 3.1 persons/ 100 sq km (Binford's packing threshold).

Binford 2001 provides a starting point.



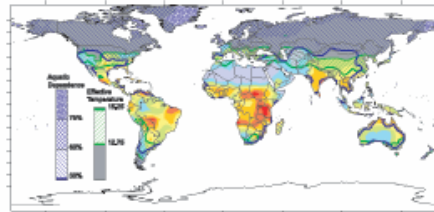
Theoretical Model for Plant Intensification

Johnson & Hard (2007) [in press, *PLAINS Anthropologist*]

OTHER THINGS BEING EQUAL,
 Hunter-Gatherers intensify when residential mobility is constrained

When aquatic resources are abundant, HGs are expected to intensify first on aquatic resources,

When seasonality too great, HGs expected not to be dominantly dependent on plants



HOW DOES THE ISOTOPE RECORD OF S MENDOZA COMPARE WITH OTHER REPORTED REGIONS?

Stable carbon isotopes have been used to explore variation in diet among individuals and through time, particularly related to increasing dependence on maize. Data reported in *Histories of Maize* (2006) serve as the foundation for this comparison. These data are supplemented with other published and in press sources.

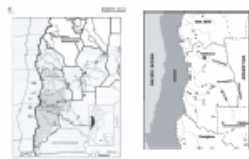


Region	Site	Age	Reference	Notes
Subsistence Strategy				
Hunter-Gathering				
Maize Adoption				

Map of Isotope Data Locations with Binford's HG Frame of Reference indicating potential HG dependence on aquatic resources

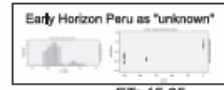


SOUTHERN MENDOZA, ARGENTINA



Maize present as early as 4000 BP, common after 2000 BP, ubiquitous after 1000 BP
 Not many macrobotanical samples
 No evidence of animal domestication
 guanaco most important animal species
 Isotope samples from last 5500 years
 $\delta^{13}C$ difference upland/lowland
 no significant change over time
 => mixed diet w/ low or indirect C4 (e.g. maize) consumption
 Regions to North and West are more dependent on maize

WHY DOESN'T MAIZE AGRICULTURE BECOME IMPORTANT IN S MENDOZA?



GOOD AQUATIC OPTION?

ET > 15.25



15.25 > ET > 12.75



12.75 > ET



Map of Isotope Data Locations with Binford's Environmental Frame of Reference indicating Effective Temperature

PRELIMINARY RESULTS OF ANALYSIS: Patterns of variation in isotope values over time relate to both ET and Aquatic Resource Potential. All regions with no good aquatic option have relatively flat isotope patterns compared with regions that do have an aquatic option. Southern Mendoza (Argentina 33-36 degrees) seems to have a lower baseline value than the Colorado Plateau/Pueblo region. Population density, population growth rates and the particular wild plants available could all impact degree of dependence on maize as indicated by isotope values.

Johnson, Gil & Neme 2007 - Poster presented at Society for American Archaeology Meetings, Austin TX in session titled "Using Binford's Frames of Reference" (A. Johnson and J. Freeman, organizers) Friday, April 27, 2007.