



Multi-elemental Analysis of Human Archaeological Bone

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FIG. 5.

Objective of Multielemental Analysis

- Theoretically, there are 2 distinct advantages to analyzing bone for trace elements.
 - Trace elements measure the actual results of food ingestion, not an estimate of what was eaten based on piles of bones or bivalves or other traditional archaeological methods of dietary estimation.
 - As living bone remodels over such a long time (femora about 3% per year), seasonal or nutritional perturbations are averaged-out over a long period, giving a better picture of average subsistence.



However, this scheme is very simplistic.

FIG. 5.

MINERAL	WHAT IT DOES	FOOD SOURCES
CALCIUM	BUILDS BONES AND TEETH AND MAINTAINS BONE STRENGTH	MILK, DARK GREEN LEAFY VEGETABLES, BEANS, PEAS, CORN
IRON	NEEDED TO FORM HEMOGLOBIN IN BLOOD AND MYOGLOBIN IN MUSCLES, WHICH SUPPLY OXYGEN TO CELLS. PART OF SEVERAL ENZYMES AND PROTEINS	RED MEATS, LIVER, KIDNEY, POULTRY, FISH, DARK GREEN LEAFY VEGETABLE, WHOLE GRAIN PRODUCTS
MAGNESIUM	HELPS TO BUILD BONES	DARK GREEN LEAFY VEGETABLES
PHOSPHOROS	BUILDS BONES AND TEETH	MEAT, POULTRY, FISH, EGGS, MILK AND DAIRY PRODUCTS
POTASSIUM	HELPS MUSCLES CONTRACT. MAINTAINS FLUID AND ELECTROLYTE BALANCE IN CELLS	FRUIT AND VEGETABLES
SODIUM	REGULATES BODY FLUID VOLUME AND BLOOD ACIDITY. HELPS IN TRANSMISSION OF NERVE IMPULSES	SALT, MILK, MEAT, FISH POULTRY AND EGGS
ZINC	HELPS FORM PROTEIN, THUS ASSISTING IN ALL TISSUE GROWTH, WOUND HEALING, ANAEMIA PREVENTION. PART OF MANY ENZYMES	MEAT, POULTRY, SHELLFISH, WHOLE GRAIN CEREALS, NUTS, SEEDS.

FIG. 5.

Paleodietary Reconstruction

- One of the approaches to paleodietary reconstruction involves the use of **Multielemental Analysis**, which employs a large and diverse group of elements.
 - **Plant based resources: Magnesium, Manganese, Vanadium, Calcium, Strontium**
 - **Animal based resources: Zinc, Copper, Molybdenum, Selenium**

