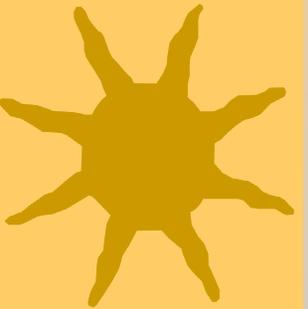


*Measuring Malnutrition in the Field  
Environment:*



*Honduran Humanitarian Mission*

---

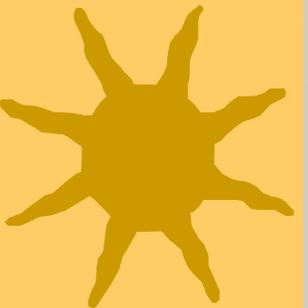


Tinsika Riggs

LT, MSC, USNR

Registered Dietitian

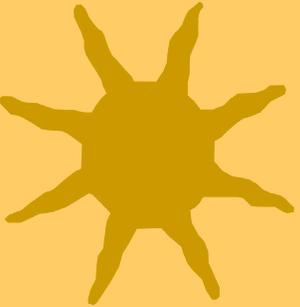
Naval Hospital Okinawa, Japan



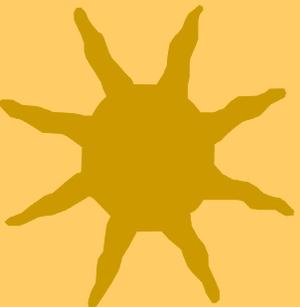


# *Why Conduct a Nutrition Survey?*

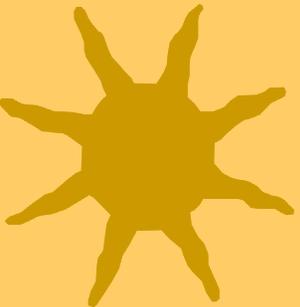
---



To Obtain Prevalence of Malnutrition; this can be use to:



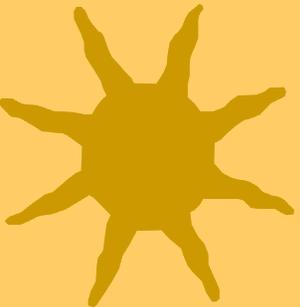
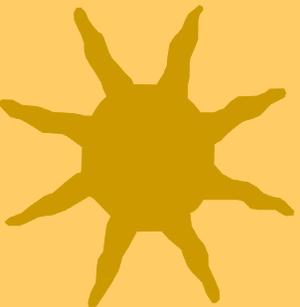
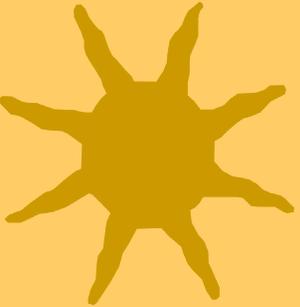
- ★ Establish the degree of emergency for the delivery of food aid.
- ★ To plan complementary interventions
- ★ As baseline information to monitor the progression of a situation over time
- ★ To determine if commodities offered are adequate/appropriate to the population





# *Mission Objectives*

---

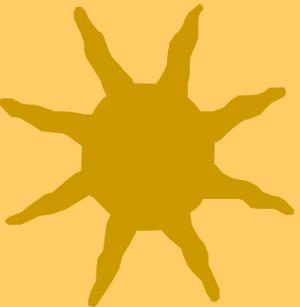
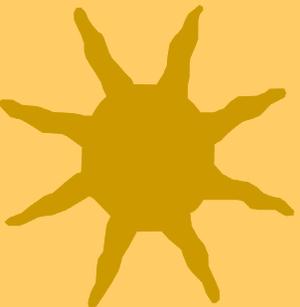
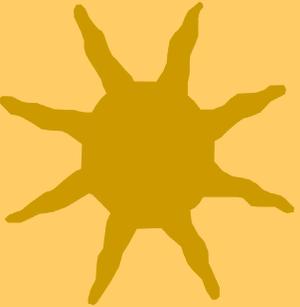


1. Provision of hands-on education and training for physicians, nurses, dietitians and medical technicians in specific skills inherent in post-war, post disaster military operations
2. Deployment training specific for military personnel for planning and executing of a medical mission



## *Mission Objectives (cont)*

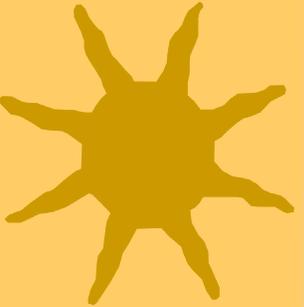
---



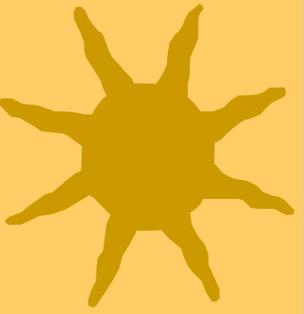
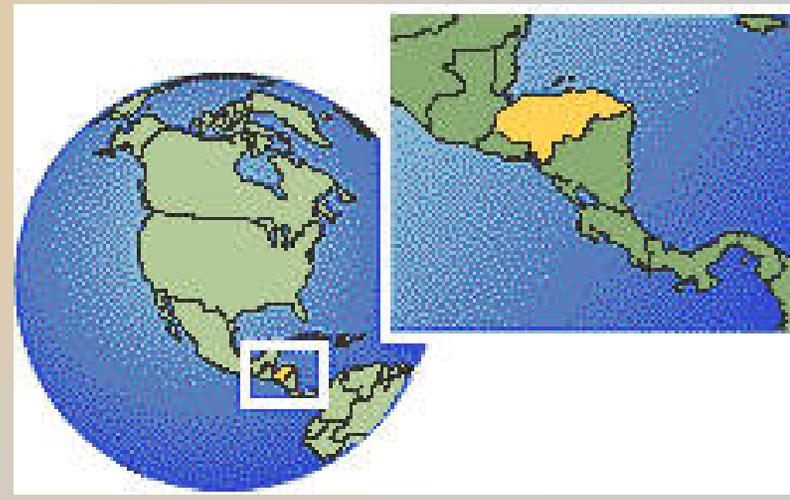
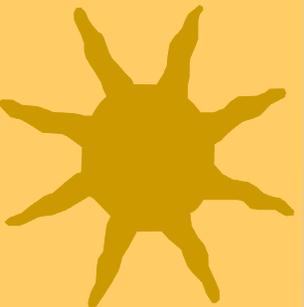
3. Improvement of Health Status of Honduran Children: data collected provided to Honduran MOH and agencies such as CARE/UNICEF, providing necessary information for planning the most effective relief work possible



# *Honduras*



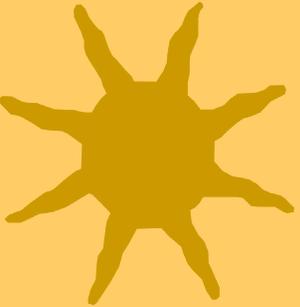
- ★ Central America
- ★ Economy
- ★ Borders Guatemala, El Salvador and Nicaragua
- ★ JTF Bravo/Medel



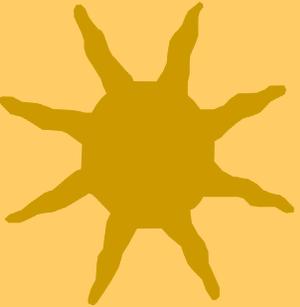


## *What We did*

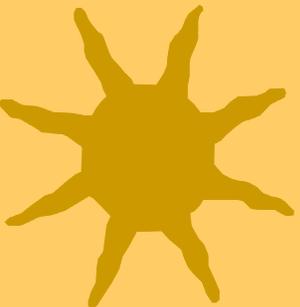
---



- ★ Went to randomly selected households



- ★ Obtained consent from parents to test children



- ★ Determined index child

- ★ Interviewed parent and put data into PDA

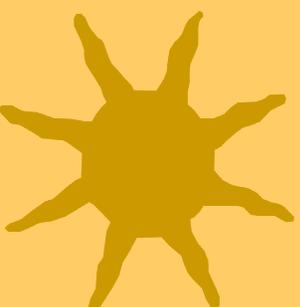
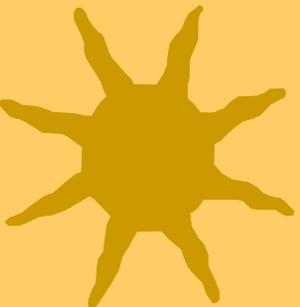
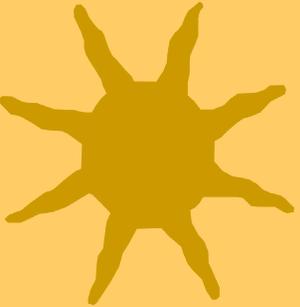
- ★ GPS measured longitude/latitude and altitude of each household

- ★ Clinical and physical examination of child



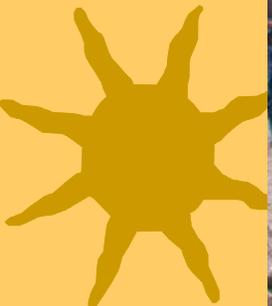
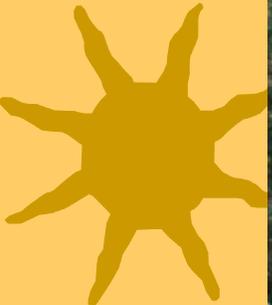
## *What We did (cont)*

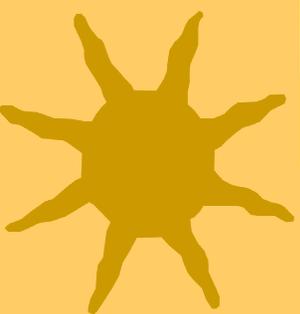
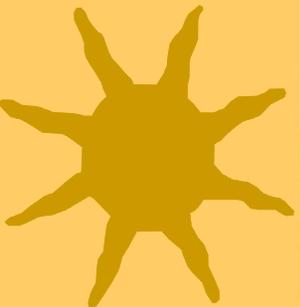
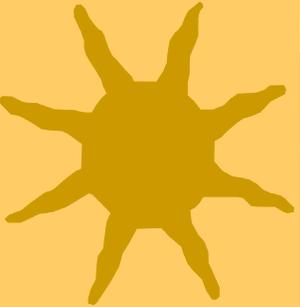
---

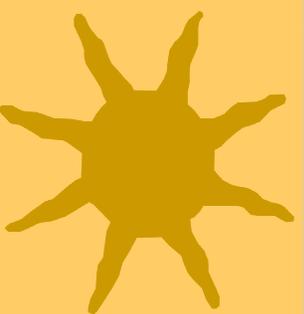
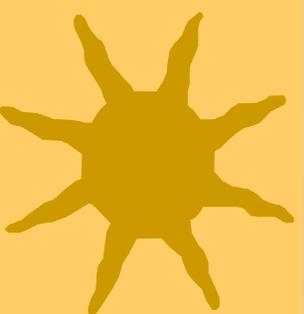
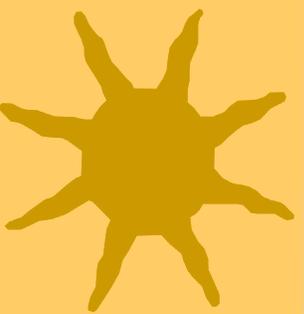


- ★ Completed measurements (Ht, Wt, MUAC and Z-scores)
- ★ Provided consult to MOH if MUAC < 12.5 cm, Z score < -2
- ★ Tx for anemia and parasites
- ★ Commodity sampling and exchange
- ★ Provide household items such as soap, toothbrushes

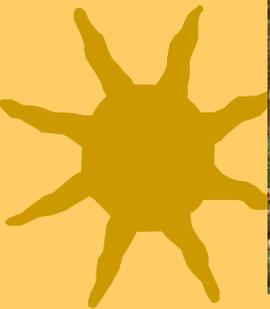
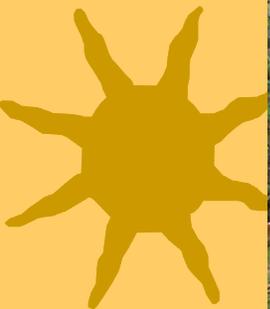
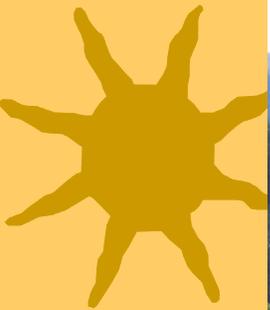


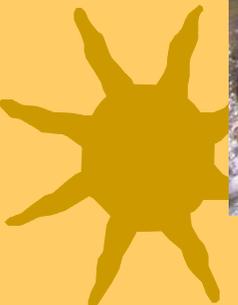
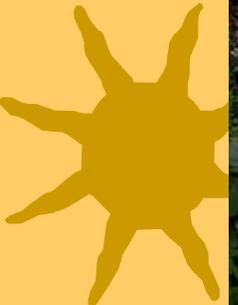


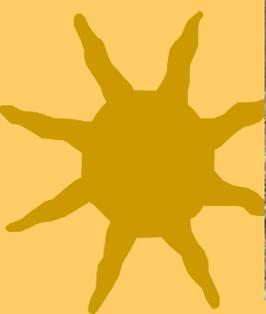
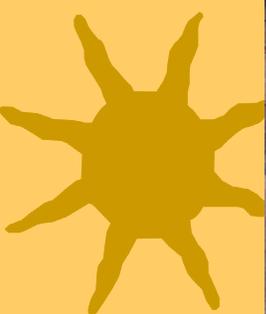
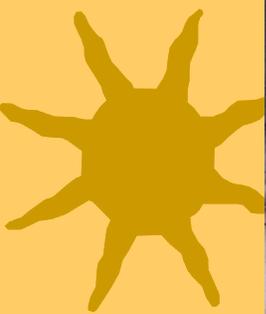








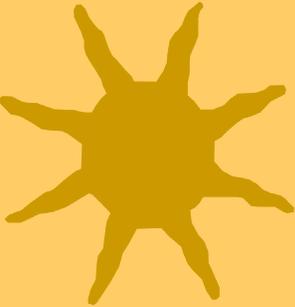






# *What We Did*

---



## ★ Clinic Day

peds physicals

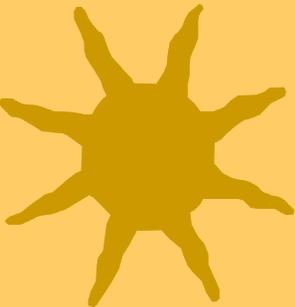
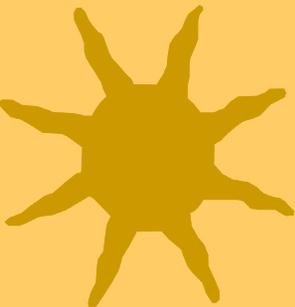
provided

vitamins/meds

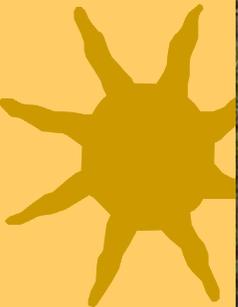
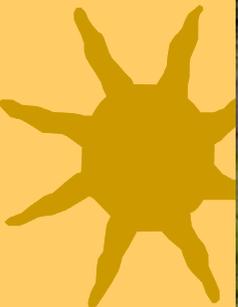
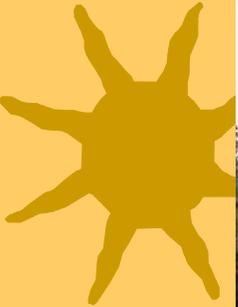
more nutritional data

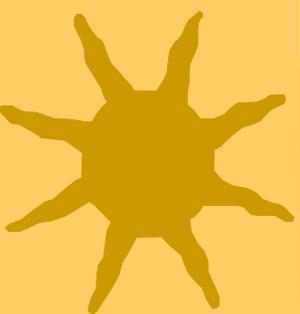
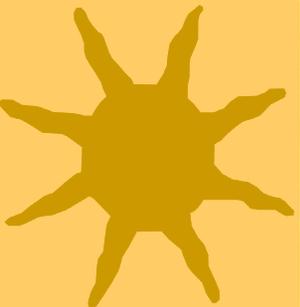
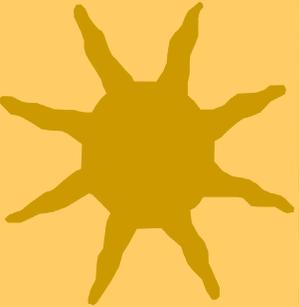
collected including

serum retinol

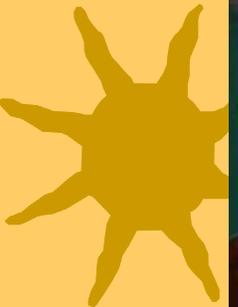
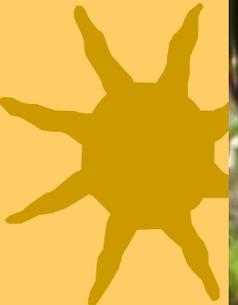


## ★ **Local Hospital Malnutrition Ward Visit**





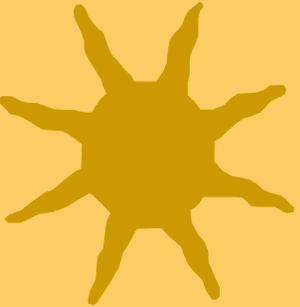






# *Measuring Malnutrition*

---



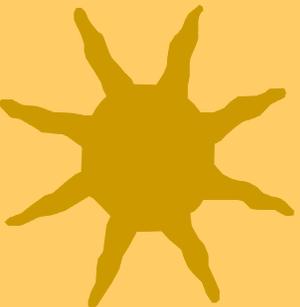
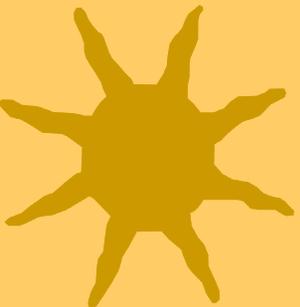
## ★ Who is Measured?

Age: 6-59 months

< 6 months old (about 60-65 cm)

More difficult to measure

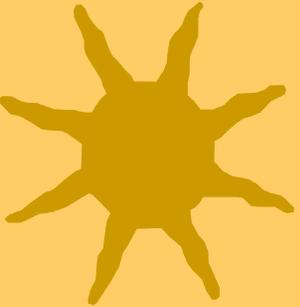
Typically still breast-fed so usually adequately nourished





## *Measuring Malnutrition (cont)*

---

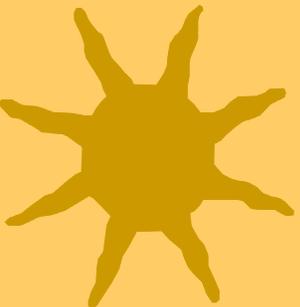
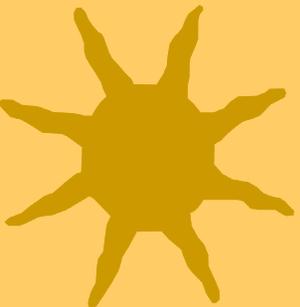


★ Height: 60-100 cm

★ Reflects status of general population

★ More sensitive to nutritional stressors

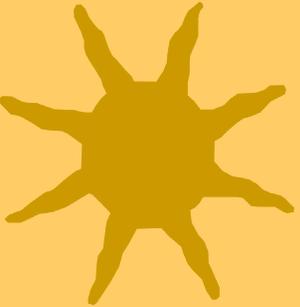
★ Good mirror of nutritional status of the general population



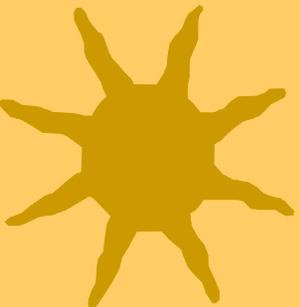


# *Measuring Malnutrition: Data to Collect*

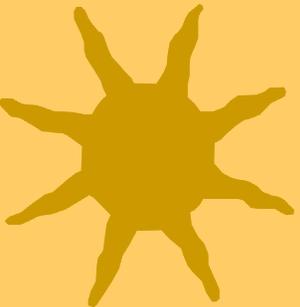
---



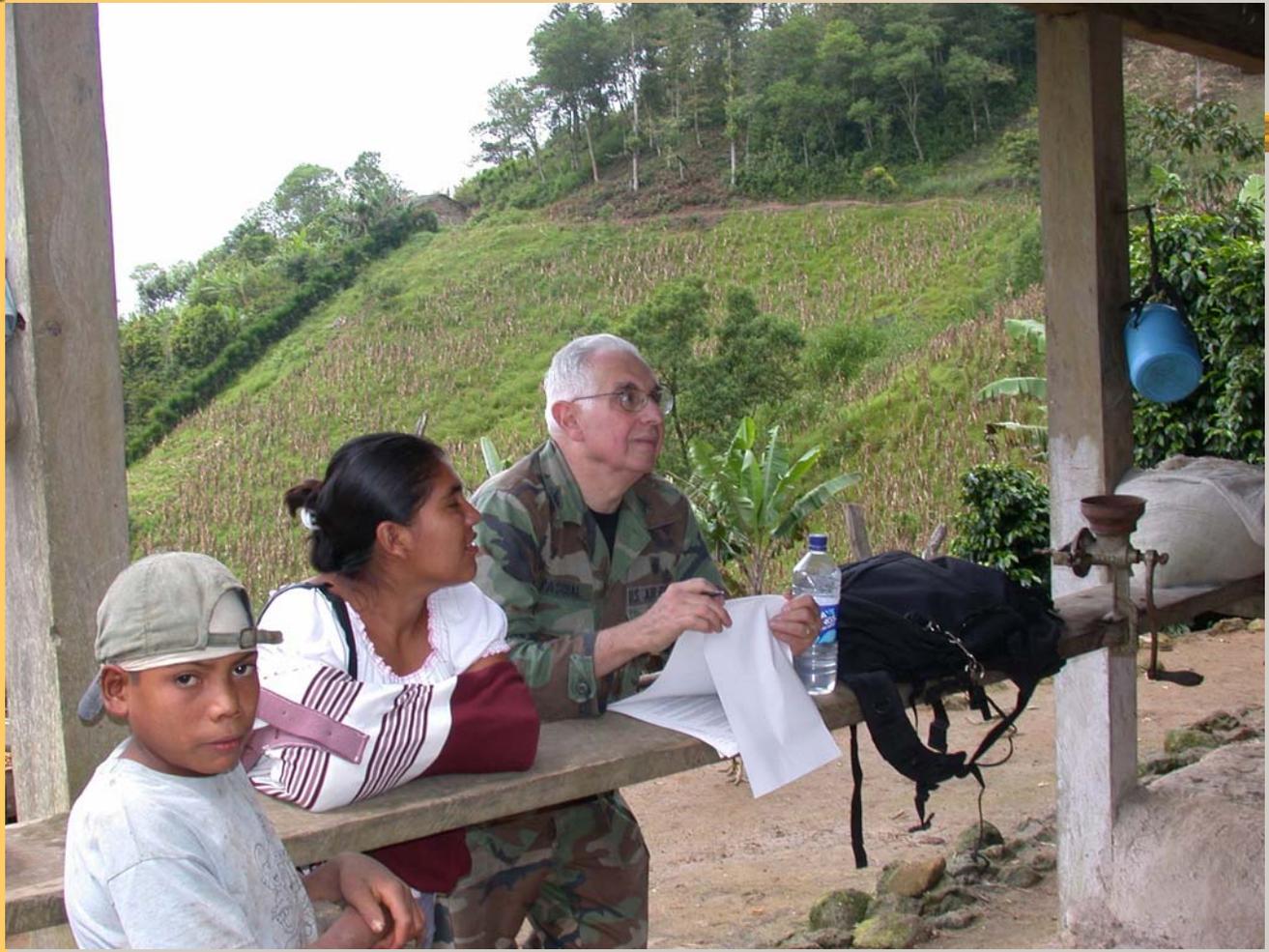
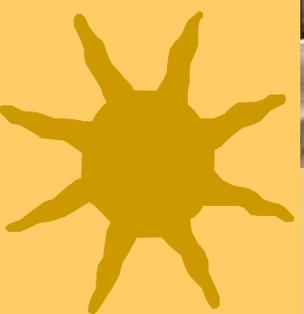
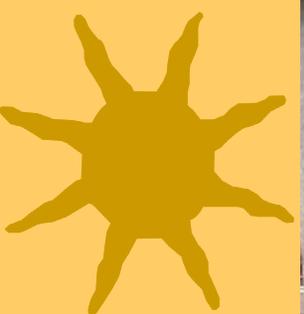
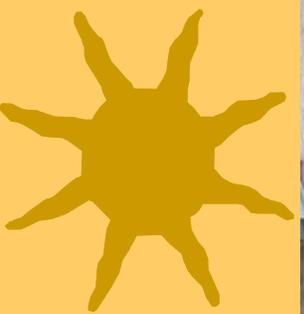
★ Weight, height, gender



★ Edema: bilateral indicates severe malnutrition, irrespective of W/H



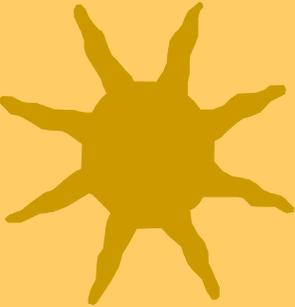
★ 1-2% of children with malnutrition indicates widespread malnutrition throughout population



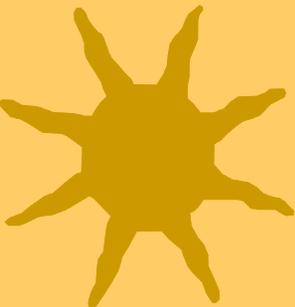


# *Sample Questions from Survey*

---

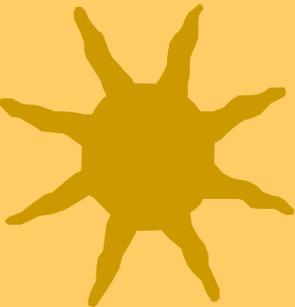


★ How many individuals living in household?



★ Ages of individuals?

★ Finding the index child



★ Receiving any food commodity assistance?

★ Food frequency questions

★ Literacy of parents

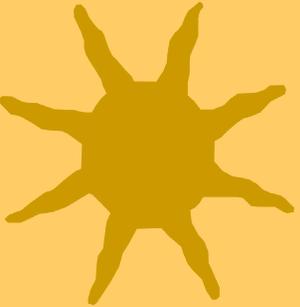
★ Years of school for parents

★ What kind of floor/roof/ water source in household

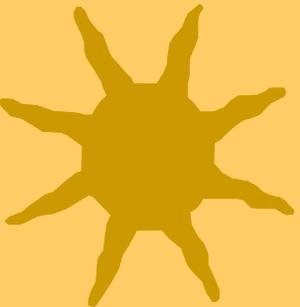


# *Measuring Malnutrition: Data to Collect*

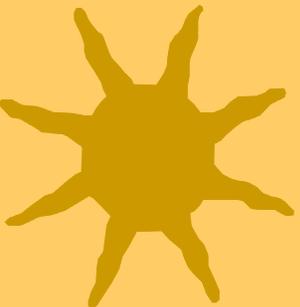
---



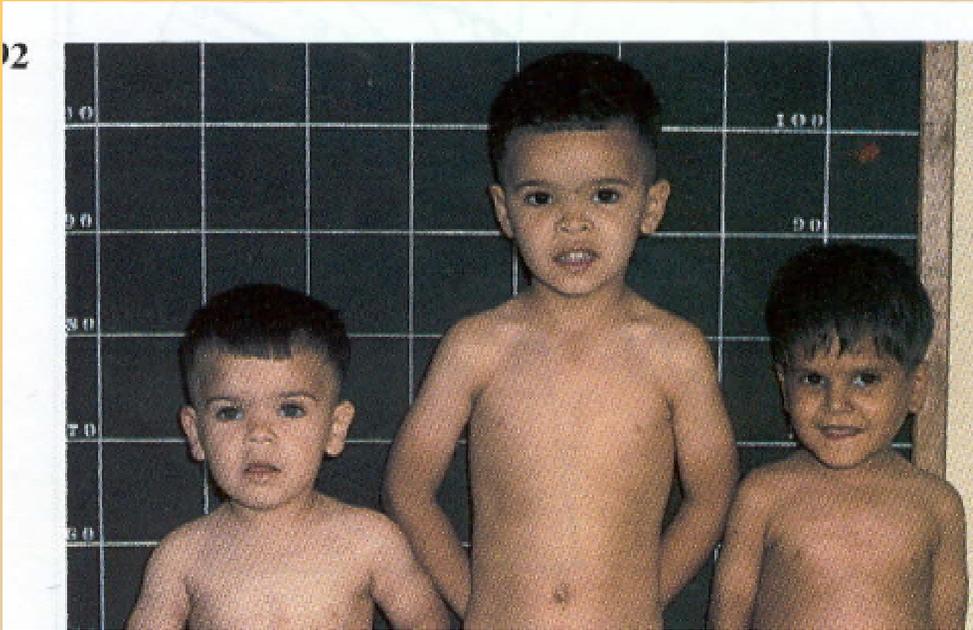
- ★ Height for Age (H/A)  
Indicator of chronic malnutrition  
“stunting”



- ★ Weight for Height (W/H)  
Indicator of acute malnutrition  
“wasting”



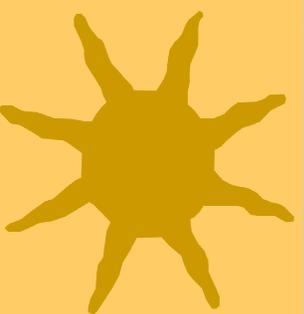
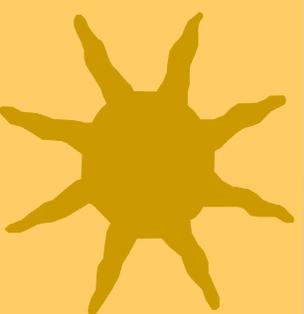
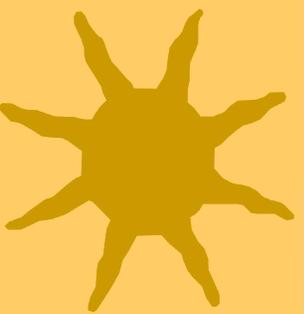
- ★ Weight for Age (W/A)  
Indicator of both long-term malnutrition and  
current malnutrition  
“stunting” and “wasting”



Ages: 2, 4.5, 5.5 years

## **Stunting:**

- **Most common evidence of chronic PEM**
- **Wt/Ht normal**
- **No evidence of clinical malnutrition**
- **Growth grossly retarded**





# Z-SCORE

---

- ★ Indicates the number of standard deviations (SD) a value is from the reference mean
- ★ 2 SD below the mean ( $<-2Z$ ) is often used as indicator of growth retardation
- ★ International Comparisons: references are comparable across all measurements, at all ages
- ★ Recommended by WHO

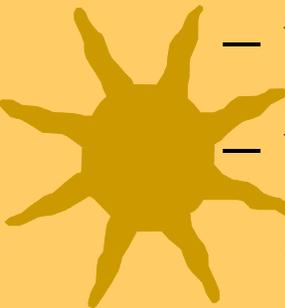


# *MEASURING MALNUTRITION*

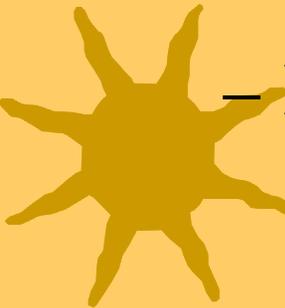
---



## MUAC

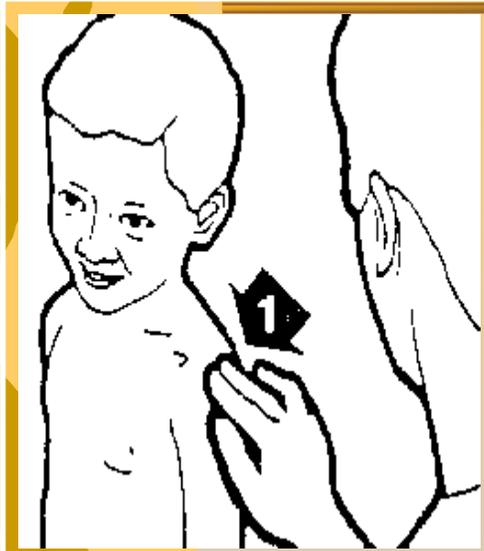


- simple, fast, good predictor of immediate risk of death (easy to use in the field environment)
- used to measure acute malnutrition 6 - 59 months
- use only for quick screening and rapid assessments of nutritional situation
- <12.5 cm, indication of severe malnutrition
- High risk of error





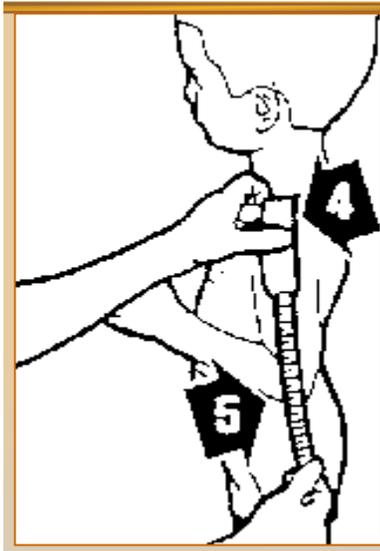
# MUAC MEASUREMENT



**1** Locate tip of the shoulder



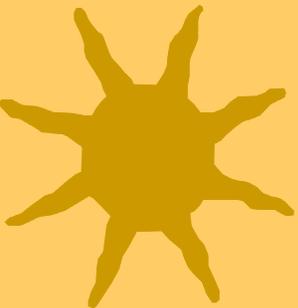
**2** Tip of the shoulder  
**3** Tip of the elbow

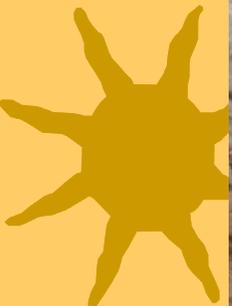
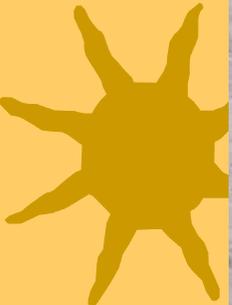


**4** Place tape at tip of shoulder  
**5** Pull tape past tip of bent elbow



**6** Mark midpoint

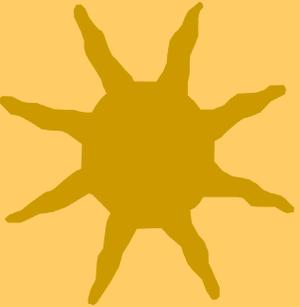




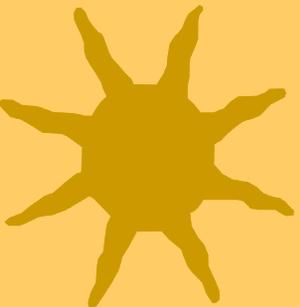


# *Commodity Sampling and Exchange*

---



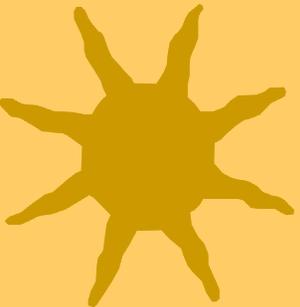
★ Honduran MOH and relief agencies distribute supplemented foods to at risk populations



★ Flour + Iron

★ Sugar + Vitamin A

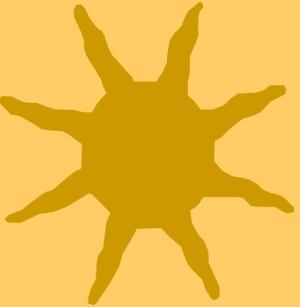
★ Salt + Iodine



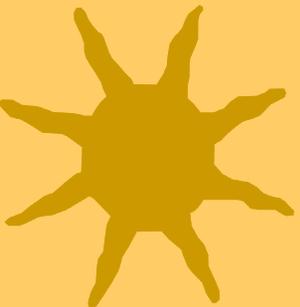


# *Commodity Sampling and Exchange*

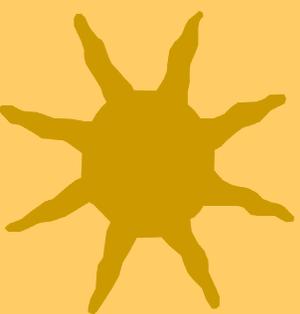
---



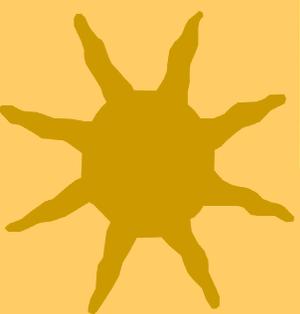
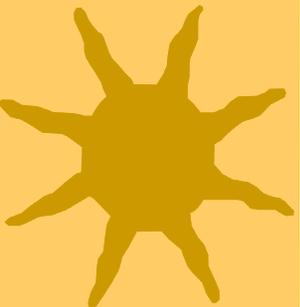
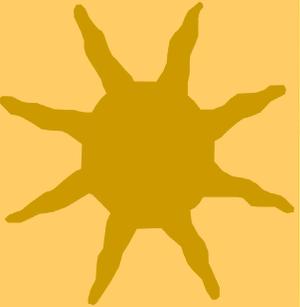
★ Survey teams collected small amounts of each of these for testing for the actual presence of these micronutrients

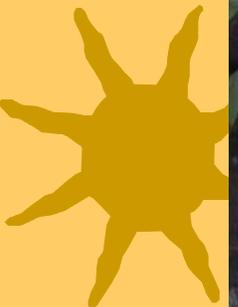
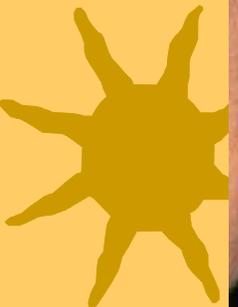


★ Provided modest replacement of supplemented commodities after taking samples



★ Important to explain this procedure in full before asking for food samples which many of these families could not afford to spare.

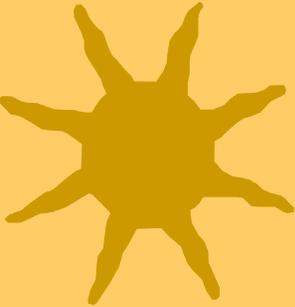




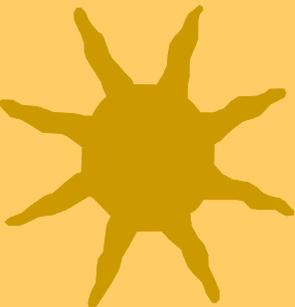


# *Rationale for using Supplemented foods*

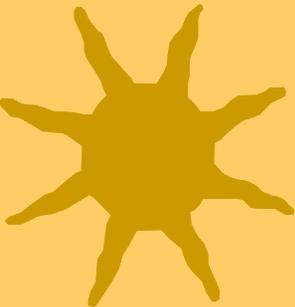
---



## Iodine Deficiency Disorder



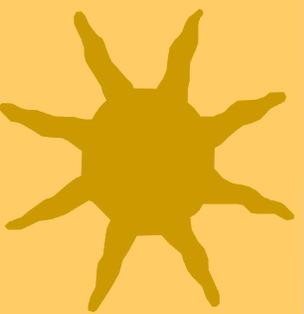
- ★ Can cause severe mental and physical retardation, known as cretinism
- ★ Goiter in both adults and children
- ★ At a population level, the consequences of iodine deficiency is a 10-15% lower intellectual quotient (IQ)
- ★ 10 cents/person/yr to provide supp.



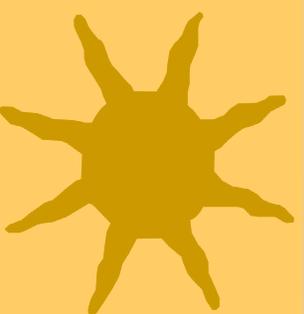


# *Rationale for using Supplemented Foods*

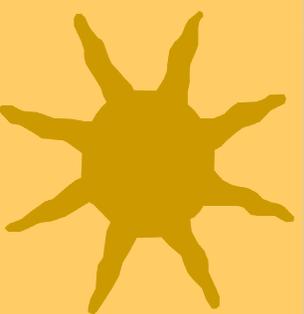
---

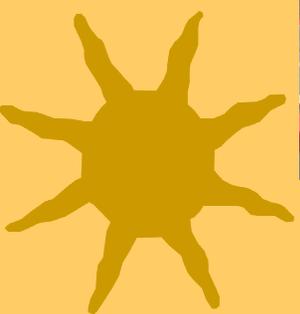
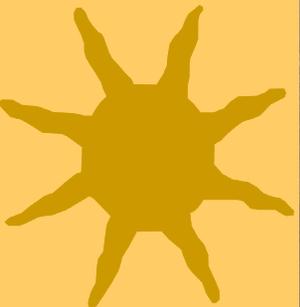
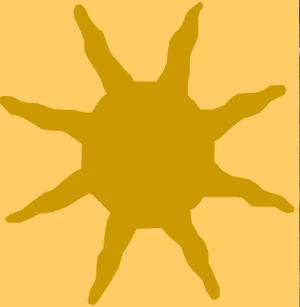


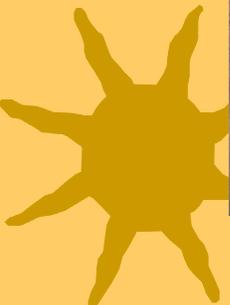
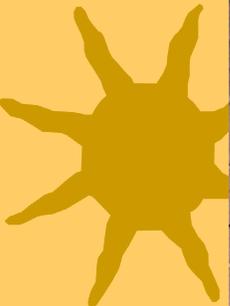
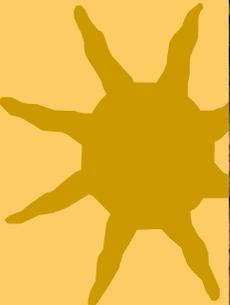
## Iron Deficiency



- ★ Impairs children's cognitive development
- ★ Decreased work capacity up to 30%
- ★ Damages immune mechanisms
- ★ Associated with increased morbidity
- ★ 20 cents/person/yr to supp.







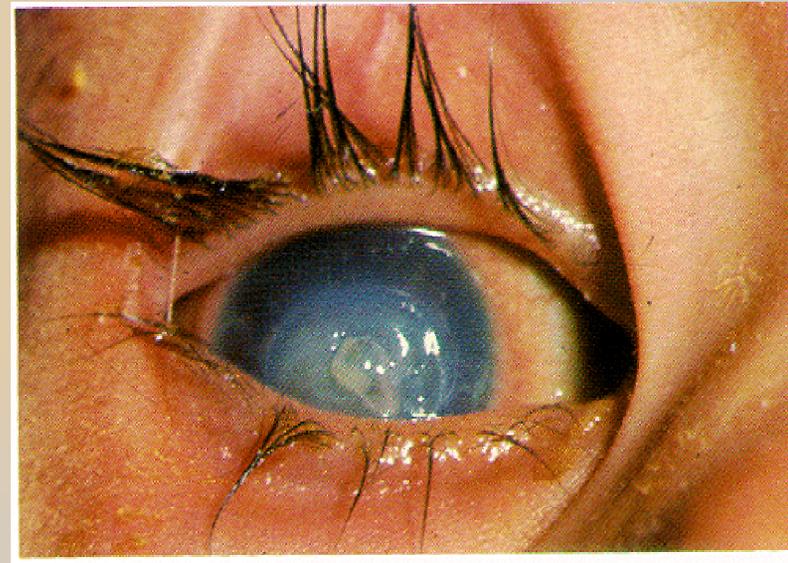


# *Rationale for using Supplemented foods*

---

## Vitamin A Deficiency

- ★ Single most important cause of childhood blindness in developing countries
- ★ Every year, about 500,000 children lose their sight as a result of vitamin A def. ~70% will die within 1 yr of losing their sight

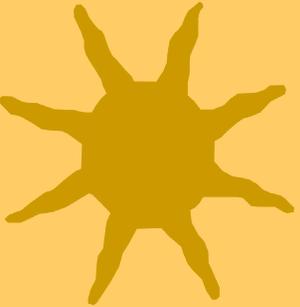


**Keratomalacia**

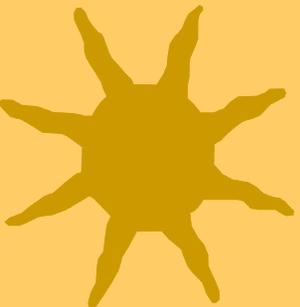


# *Rationale for using Supplemented foods*

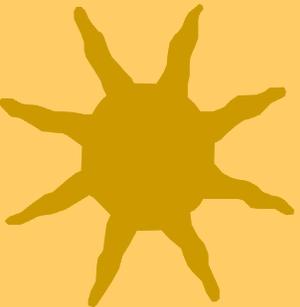
---



## Vitamin A Deficiency



- ★ Increases the risk of severe illness, and even death, from common childhood infections such as diarrheal diseases and measles
- ★ In developing countries 200-300 million preschool children are at risk





# Outcomes of Survey



- ★ 47 households surveyed
- ★ 66 children evaluated in those homes
- ★ 17/66 (26%) profoundly anemic
- ★ 3/66 (4.5%) severely malnourished
- ★ Truly random



# *Outcomes of Survey*

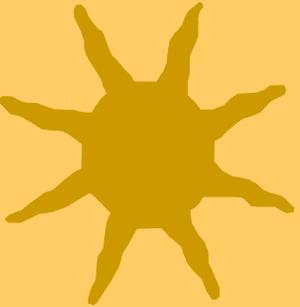


- ★ Clinic day: 147 children eval and tx
- ★ Team members became proficient in deployment related tasks essential for medical mission



## *Questions?*

---



“A Dog Starved at the Palace Gate Predicts  
the Ruin of the State”

-William Blake

