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Abstract # C318 I

Feeding Patterns and Dietary Diversity Scores of 6 to 36 month old Children from Retalhuleu, Guatemala

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ABSTRACT

Feeding pattern and dietary diversity were evaluated in 339 stunted children (HAZ < -1) 6-36 months of age from Retalhuleu using a food frequency questionnaire (Food and Nutrition Technical Assistance protocol). Dietary assessment was utilized to determine the frequency of food consumption for 7 consecutive days and was considered appropriate if the food was included a minimum of 3 times per week in 75% of the population. Results indicated breast milk consumption was not appropriate; 73% of children 0-6 months were breastfed at least 3 times per week and consumption decreased to 61% in children 19-24 mo. The primary source of vitamin A was fortified sugar resulting in 88-96% of the age groups having appropriate vitamin A consumption patterns; vegetables rich in vitamin A were not consumed (0%). Meat and poultry had appropriate consumption in the 25-30 months of age group (80%), while younger children had intakes less than 75%. Consumption of cereals and grains increased with age and appropriate consumption averaged 84% for infants and 86% for children 25-36 months. Hen eggs were the most frequently consumed food item (97%) as were instant soups, bean broths and other liquids (84%). In conclusion, diet diversity is poor in infants and young children from Retalhuleu, Guatemala. Fortified sugar and hen eggs were the only items consumed appropriately across all age groups. Opportunities exist to increase breast feeding and improve complimentary feeding practices.

INTRODUCTION

Malnutrition of children under five in Guatemala is still highly prevalent mostly due to poverty, impact of natural disasters and the ineffective coverage of governmental nutrition and health programs in some regions.

Similar to the nutritional situation in Guatemala's "dry corridor" (departments of Chiquimula, Jalapa, Jutiapa, El Progreso and Baja Verapaz), there are high levels of micronutrient deficiency in the Southern Coast or V Region, including the departments of Suchitepéquez, Retalhuleu, Quetzaltenango and San Marcos [1]. The purpose of this study was to identify and characterize the feeding patterns and dietary diversity of 6 to 36 month-old malnourished children from San Felipe, Retalhuelu in the region of the Takalik Abaj.

Table 1. Food Group Classification

	Group	Examples
1	**Grains, Roots and Tubers**	Tortilla, tamales o chuchos, rice, bread, pasta, sweet potato, potato, yucca, plantain, Corn Flakes, Cereals
2	**Vegetables rich in Vitamin A**	Carrots, güicoy sazón (variety of squash), sugar
3	**Other Fruits and Vegetables**	Papaya, mango, cantaloupe, peach, granadilla, jocote (purple mombin), mandarins, oranges, macuy (edible leaf), chard, spinach, amaranthus.
4	**Beef, chicken, fish and seafood**	Baked/fried chicken, beef, pork, fish, liver, viscera, sausage, jam, chorizo
5	**Eggs**	Hen eggs
6	**Legumes and dried fruits**	Black beans
7	**Milk and dairy products**	Breast milk, baby formula, milk or powder milk, cheese
8	**Oils**	Vegetable oil, butter, cream, margarine, lard, avocado
9	**Not in IDDS grouping, considered appropriate***	Bean broth, other broths or soups, packet soups, cookies, fortified atoles like Incaparina®, Bienestarina® and Chispuditos® , other atoles (oat, faba, plantain and cornstarch), natural refreshments, homemade fruit juices and water.
10	**Not in IDDS groupings, considered inappropriate***	Powdered flavored drink mixes, artificial juices, carbonated drinks, coffee, tea, infusions, industrial fruit purees, lollipops, junk food.

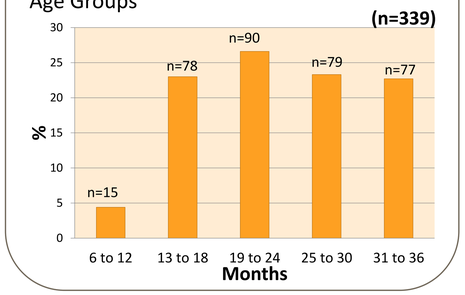
***Groups 9 and 10 were created to include food items that were not included in the Individual Dietary Diversity Score (IDDS) groupings of the FANTA protocol [2]. Products in group 9 were considered appropriate because items had nutritional value and group 10 consisted of foods that were not nutritionally valuable.**

METHODS

A total of 339 malnourished children (48% boys, 52% girls) ages 6 to 36 months from San Felipe, Retalhuleu were enrolled. A food frequency questionnaire was designed and validated by trained evaluators who interviewed the participants' caretakers in their respective homes to characterize the foods consumed by the child during 7 consecutive days prior to the survey. Information collected was classified using the food groups established by the Food and Nutrition Technical Assistance (FANTA) [2]. Survey analysis was based on the dietary guidelines for Guatemala (CONGA) and the Dietary Guidelines for Guatemalan Population less than 2 years [3, 4]. Foods were considered appropriate if it was included a minimum of 3 times per week in ≥75% of participants in each age group. Breastfeeding patterns were analyzed separately.

RESULTS

Graph 1. Study Participants Distributed by Age Groups



Graph 2. Breastfeeding Practices Among Children ≤36 Months of Age

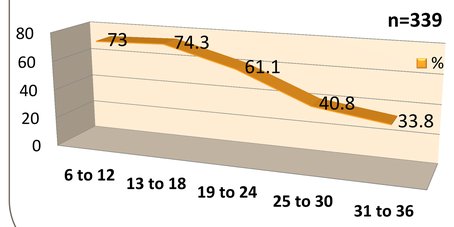








Table 2. Consumption of food groups by age.

Food Groups	Type	% of Consumption by Age Group					
		6 to 12	13 to 18	19 to 24	25 to 30	31 to 35	≥ 36
Grains, Roots or Tubers	Tortilla	80.0	83.8	84.4	86.8	85.1	91.6
	Rice						
	Noodles						
Vegetables rich in vitamin A and Sugar	Sugar	88.3	78.2	79.8	83.3	95.9	100
	Carrot						
	Güicoy sazón						
Other Fruits and Vegetables	Papaya	25.0	77.6	36.0	78.3	79.7	66.7
	Orange						
	Banana						
Meat, poultry, fish and seafood	Boiled chicken	46.0	71.8	70.0	80.3	74.5	83.3
	Sausages						
	Cure meet						
Eggs	Hen eggs	100	92.3	94.4	96.1	100	83.3
Legumes and dried fruit	Black beans puree	61.0	70.5	86.7	93.4	95.4	100
Milk and dairy products	Milk	*	*	*	*	*	*
	Cheese						
Oils and fats	Vegetable oil	*	*	*	*	*	*
Not in IDDS grouping; considered appropriate	Atoles	83.3	78.2	79.8	83.3	95.9	100
	Bean broth						
	Natural juices						
	Chispuditos						
Not in IDDS grouping; considered inappropriate	Artificial Juices	93.3	*	75.6	78.9	*	*
	Packaged soups						
	Coffee						
	Carbonated drinks						

* Indicates no consumption.

DISCUSSION

- Breast milk is still the most important food for children up to 36 months of age (Graph 2).
- Children ≥6 months of age have an increasing trend for consumption of roots and grains probably due to accessibility, price and cultural relevance (Table 2).
- A positive practice among children ≥12 months old is the moderate egg consumption that tends to increase as age increases.
- Vegetable consumption is nearly zero across all age groups.
- This study identified that instant and packet soups, bean broth and other liquids such as water are widely consumed among Guatemalan children ≤3 years of age.
- Powdered flavored drink mixes, artificial juices and coffee were some of the most frequent items that mothers were using to feed their children. These substances are rich in caffeine and methylxanthines and age inappropriate.
- There is a high consumption of food products rich in phytates (corn and beans). Phytates are non-digestible phosphate-rich cyclic acids present in plants. Dietary divalent cations like zinc and iron are susceptible to chelation by phytates resulting in a decreased absorption of these minerals. In this context, high phytate diets and low consumption of food products rich in these micronutrients pose a particularly high risk of mineral deficiencies.
- This is the first study of its type to be performed in the San Felipe community in the South Western region in Guatemala. Unfortunately, Guatemala has one of the highest prevalences of stunting (HAZ<2SD) in the world. Additionally, the proportion of the population that is overweight continues to rise increasing the double burden of malnutrition in Guatemala [5].
- With this information, health professionals and policy makers can focus their efforts on strengthening nutrition knowledge among families, especially during weaning and introduction to healthy and nutritious complementary food, integrating fathers in the decision making of the children's nutrition, and directing public health programs to increase micronutrient intake and nutrition literacy in the population.

CONCLUSIONS

1. **Breast milk is a very important source of nutrients for children ≤36 months.**
2. **Widely consumed foods are rich in phytates, which tend to decrease de absorption of divalent cations posing an increased risk for certain micronutrient deficiencies.**
3. **Complementary feeding practices are not appropriate as diets are monotonous, lack variety, are not age appropriate, and in many cases foods provided are not a significant source of nutrients.**
4. **This study characterized the diet of children ≤3 years of age, and identified strengths but most importantly identified dietary patterns that are negative and modifiable. An opportunity exists to promote consumption of a more diverse diet comprised of locally available nutritious foods, and better complementary feeding practices. Increased emphasis should be placed on educating caretakers on importance of increasing diet diversity and inclusion of suitable vegetables into the diets of young children. Solid foods as opposed to liquids should be encouraged to increase nutrient density and nutrient content.**

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CONTACT INFORMATION

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