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ABSTRACT

Results of a 1968 pilot study of the nutritional status of Mexican American preschool children in East Los Angeles and San Diego are reported in this document. Questionnaire data collected from mothers of preschool children are presented in terms of a description of families, prenatal care, clinical examinations, dietary intakes, and biochemical determinations. (Sample sizes ranged from 8 to 41 children, depending on the intended study variable.) The study indicated, for example, that these children had adequate intakes of protein, riboflavin, ascorbic acid, and niacin but that iron intakes were low. (JB)

Subject	Nutritional Status of Mexican American Preschool Children in East Los Angeles and San Diego*
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Because no studies had been made of the nutritional status of Mexican American preschool children in Los Angeles the students at California State College Los Angeles undertook in late 1968 a pilot study of this group.

Subjects and Procedures

The families studied were those of children attending Head Start in East Los Angeles. For the children there were diet records, biochemical determinations and clinical examinations. In addition blood and urine samples were also determined for children attending a neighborhood center in San Diego. There were no diet histories or clinical examinations for the Sar Diego children.

A dietary questionnaire was distributed to the mothers. For those who could not read English, a Spanish questionnaire was given. Three day diet records were kept. In addition the mothers were asked questions concerning snacks, early feeding practices, buying practices, pregnancy, etc. The diet records were coded and calculated by computer. Each child's intake was compared to the 1968 Recommended Dietary Allowances (RDA) for its age.

Plasma ascorbic acid was determined by the phenylhydrazine method (ICNND, 1963). Urinary thiamine was determined by the thiochrome method (Henry, 1967), urinary riboflavin by the modified method of Slater and Morell (1947) and urinary N-methylnicotinamide by the method of Pelletier and Campbell (1962).

Clinical examinations were made by doctors at Children's Hospital in Los Angeles.

*Presented at American Institute of Nutrition Annual Meeting.

Results

Description of families. Approximately one third of the parents were born in Mexico while approximately 20% of the children were born in Mexico. The mean family size was 5.8 while the median and mode was six. The mean weekly income per person was $13 while the median and mode was $12 and the range $8-22. Approximately 20% of the fathers were unemployed. In most families only one member was employed. One third of the respondents anwered in Spanish.

Prenatal care. All but one mother had medical help during her pregnancy. 80% indicated they had taken vitamins during pregnancy.

Clinical examinations. Twenty-one children were examined. Twelve had medical problems. Three had severe dental caries. None had clinical signs of vitamin deficiencies.

Dietary intakes. Mean nutrient intakes were calculated for each of the 23 children and compared to the 1968 Recommended Dietary Allowances. Table I shows the numbers of children meeting the RDA for each nutrient. All met 100% of the RDA for riboflavin and all but one met 100% of the protein. All but one met 67% of the RDA for calcium, phosphorus and vitamin A. Three did not meet 67% of the RDA for thiamine. Caloric intake was 100% or more of RDA for 39% of the children and 43% had between 67-100% of RDA. Seven (31%) did not meet 67% of the RDA for ascorbic acid or niacin. Niacin equivalents were not calculated. Since the diets were high in protein, tryptophan probably contributed a sizeable amount of niacin equivalents. Intakes of iron were below 67% of RDA for 11 of the children.

Biochemical results. Table II shows the distribution of ascorbic acid values found for the children. None of the 29 children for whom determinations were made had plasma levels low by ICNND (Interdepartmental Committee on

Table I

Percentage of 23 Mexican American Preschool Children

Meeting Various Levels of 1968 Recommended Dietary Allowances (RDA)

Nutrient	% of RDA					
	≥ 100 %	75-99 %	67-74 %	50-66 %	33-49 %	<33 %
riboflavin	100	0	0	0	0	0
protein	96	4	0	0	0	0
phosphorus	87	9	0	4	0	0
calcium	70	26	0	0	4	0
vitamin A	74	17	4	4	0	0
thiamine	57	30	0	13	0	0
calories	39	39	4	13	4	0
niacin	13	57	0	9	13	9
ascorbic acid	43	13	13	13	9	9
iron	17	26	9	13	17	17

Table II

Plasma Ascorbic Acid Levels of

29 Mexican American Preschool Children

Standards	plasma ascorbic acid mg %	East Los Angeles			San Diego	Total
		Total	Head Start	Pre-Head Start		
		N	N	N	N	N
ICNND						
deficient	<0.10	0	0	0	0	0
low	0.10-0.19	0	0	0	0	0
acceptable	0.20-0.39	1	0	1	0	1
high	≥0.40	11	5	6	17	28
Children's Bureau						
acceptable	0.30	12	5	7	17	29
Bessey and Lowry						
poor	<0.4	1	0	1	0	1
fair	0.4-0.6	2	0	2	0	2
good	0.7-1.0	2	2	0	5	7
excellent	≥1.1	7	3	4	12	19

Nutrition for National Defense) or Children's Bureau standards and all but one had levels that would have been considered excellent by these standards. This could mean that the RDA is set too high or the standards for plasma levels are set too low. It may mean that the 3 day dietary intake record either did not accurately reflect all sources of vitamin C or that the intake for vitamin C was better generally than for the 3 days recorded.

The Bessey and Lowry standards are much higher, plasma values below 0.7 mg% being considered fair or poor. Using these standards three of the twelve or 25% of the Los Angeles preschool children had fair or low values. This would be somewhat more comparable to the 31% who had dietary intakes less than 2/3rd of RDA. The study does indicate that these children at this particular time, May and June, were not deficient by ICNND standards. Surveys elsewhere have shown that the Mexican American populations have fewer persons deficient in ascorbic acid (McGanity, 1969).

The biochemical determinations of urinary riboflavin indicated that all the East Los Angeles children studied had high levels except one whose excretion was in the acceptable range. The results are shown in Table III. This biochemical data substantiates the dietary intake data. There was one low value and 4 acceptable values among the San Diego children. The rest were high.

The results of the biochemical determinations for thiamin are shown in Table IV. None of the East Los Angeles children had excretions considered low or deficient, but two San Diego children had low or deficient levels. The dietary records indicated that three East Los Angeles children had intakes less than 2/3 rds of RDA. The sample size for the biochemical determinations is small so it may not accurately reflect the nutritional status of this group. Another explanation for the discrepancy may be the possible errors inherent in using a casual urine sample with creatinine as a reference index.

Table III

Urinary Riboflavin Excretion of

41 Mexican American Preschool Children

ICNND Standards	mcg riboflavin/g creatinine 1-3 yrs	4-6 yrs	East Los Angeles Total	Head Start	Pre-Head Start	San Diego	Total
			N	N	N	N	
deficient	<150	<100	0	0	0	0	0
low	150-499	100-299	0	0	0	1	1
acceptable	500-900	300-600	1	0	1	4	5
high	>900	>600	15	6	9	20	35
total N			16	6	10	25	41

Table IV

Urinary Thiamine Excretion of

14 Mexican American Preschool Children

ICNND standards	mcg thiamine/g creatinine 1-3 yrs	4-6 yrs	Number of children East Los Angeles*	San Diego	Total
deficient	<120	<85	0	1	1
low	120-175	85-120	0	1	1
acceptable	176-500	121-400	3	3	6
high	>600	>400	4	2	6

*6 out of 7 Pre Head Start, ages 2-3 years

N-methylnicotinamide excretions were determined for 8 children. No standards have been set for N-methylnicotinamide excretions for preschool children. However, as shown in Table V, when the values are compared to a study of Honolulu preschool children (Brown et al, 1970) the values are similar.

When the three day diet records for 25 children were examined by the four basic food groups it was shown that milk and protein intakes were sufficient for most of the children and that the cereal and vegetable groups were frequently insufficient. These are shown in Table VI. If three servings of milk were used as criteria 80% met this. Of those that met the number of servings for 3 groups, 8 of the 10 met them for meat, milk and cereal groups and the other 2 for meat, milk and vegetable groups. Of those that met only 2 groups, 4 out of 5 met them for the meat and milk groups. The number of servings of cereal and bread and of the vegetable groups are shown in Table VII. It can be seen that a substantial number of children had only an average of two servings of vegetables and fruits for the three days of the diet record.

A questionnaire concerning the number of times various foods were eaten by the children each day or week was filled out by the mothers. See Table VIII for the frequency that vegetables and fruits were reported to be eaten. This indicated that the mothers believed their children ate fruits and vegetables more often then the breakdown of their diet records by food groups indicated. The questionnaire indicated that sources of vitamin C were eaten more frequently than the mean 3 day diet record indicated. This might explain the plasma ascorbic acid levels found.

This study indicates that for this sample of Mexican American preschool children intake of protein and riboflavin, that is, meat and milk, was sufficent. Dietary intake records indicated low ascorbic acid intake but

Table V

Niacin Intake and N-Methylnicotinamide Excretion of

8 Mexican American Preschool Children

Subjects	N	mean intake niacin mg	mg N-methylnicotinamide/g creatinine			
			Mean	S.D.	S.E.M.	Range
Mexican American	8	6.9	11.0	7.5	2.3	3.94-29.0
Honolulu preschoolers	125	7.8	12.7	6.9		

Table VI

Percentage of 25 Mexican American Preschool Children Meeting Basic Four Food Groups

All four food groups	28%
Three food groups	40
Two food groups	20
One food group	12
Milk (2-3 servings)	96*
Meat	88
Cereal	60
Vegetable-fruit	40

*If 3 servings used as criteria 80% met

Table VII

Number of Servings of Cereal and Vegetable Groups Eaten by 25 Mexican American Preschool Children

Servings	Cereal-bread	Vegetable-fruit
	%	%
4 or more	60	40
3	28	16
2	12	24
1	0	12
0	0	4
?	0	4

Table VIII

Mean Frequency of Servings of Vegetable-Fruit Group for 25 Mexican American Preschoolers

	Per Week	Av./day
Citrus	8.1	1.2
Other fruit	4.7	0.7
Potatoes	2.3	0.3
Cooked Vegetables	5.0	0.7
Raw Vegetables	5.0	0.7

niether the biochemical data nor the answers to the food frequency questionnaire indicated this. While niacin intakes appeared low for many, biochemical data indicated that N'-methylnicotinamide excretion was similar to that reported for other preschoolers. The adequate intake of milk and protein probably provided sufficient tryptophan for conversion to niacin. The dietary intake data would indicate that the greatest dietary problem for this group of children as for many others is iron.

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