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INTRA-FAMILY USE OF DONATED FOODS:

THE SALVADORAN CASE

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Guatemala, March 1992

INCAP Publication C-311

PROLOGUE

This paper is an abridged final report of the study ***Intra-Family Use of Donated Foods,*** *carried out in the Republic of El Salvador under the joint responsibility of the Salvadoran Ministry of Public Health and Social Welfare and the Institute of Nutrition of Central America and Panama (INCAP).*

María Teresa Menchú of INCAP's Food and Nutrition Planning Division coordinated the study and Olga Tatiana Osegueda of the Nutrition Department of the Salvadoran Ministry of Public Health headed the field work. Melba Zuniga, Honduran sociologist, and Ricardo Sibrián, INCAP's statistician, acted as consultants. Maribel de Tobar, Head of the Nutrition Department of the Salvadoran Ministry of Public Health, and Humberto Méndez of INCAP's Data Processing Center participated in the data analyses and report drafting.

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INTRODUCTION

This paper is an abridged final report of the study entitled **Intra-Family Use of Donated Foods** carried out in the Republic of El Salvador under the joint responsibility of the Salvadoran Ministry of Public Health and Social Welfare and the Institute of Nutrition of Central America and Panama (INCAP). The study was funded by the Regional Office for Central America and Panama (ROCAP) of the US Agency for International Development as part of the Technical Support Project for Food Assistance Programs, implemented by INCAP under Grant-in-Aid No. 596-0116.

This is another effort to increase the knowledge of family perception and the use of foods donated by Mother-Child Feeding Programs, and on the effect of donated foods on family dietary ration size, particularly on ration sizes of target children. Much of the knowledge we now possess is anecdotal, or comes indirectly from evaluations and reports. Consequently, the goals of this study were:

1. To assess family perceptions of donated foods, and document both on how they were used and how they affected family diets, especially those of the children targeted by the Mother-Child Health Program.

2. To present and test a methodology to carry out this type of study.

3. To provide decision-makers with information that they could use in the development of decision-making criteria on donated foods ration size and type, as well as in the strengthening of other elements of Mother-Child Health Programs.

I. DESCRIPTION OF THE STUDY

1. Background and justification

As in many other Latin American countries, the Ministry of Public Health and Social Welfare in El Salvador implements a Mother-Child Feeding Program as part of its out-patient nutrition care. At its onset, the program used foods donated by the United States Government under US Public Law 480, Title II; however, as of 1979, it works with UN World Food Program products, under Project WFP/ELS 2317 (1,2).

When this study was started, the WFP/ELS 2317 Project was being implemented nationwide by more than 270 health posts of varying complexity, and included the monthly distribution of individual food rations to undernourished children, pregnant and lactating women.

The monthly ration was made up of 13.2 lb of rice, 2.6 lb of beans, 3.2 lb of powdered skimmed milk and 2.0 lb of oil, equivalent to 1,316 kilocalories per day. The Project also established that all food recipient women receive orientation on the use of food items available in the home, including donated foods, and on health care, especially that of women and small-children (3). It is hoped that food care, as a component of mother and child care, may foster adequate growth and development of recipient children, satisfactory nutritional status in pregnant women, and insure breast-feeding (4).

In 1987 the Salvadoran Ministry of Public Health made an evaluation of Project WFP/2317 with the purpose of detecting the main problems that affected its implementation and identifying feasible corrective measures (5). On that occasion it was found that 67% of the recipient families received sufficient food for only one family member which, however, was consumed by the entire family. Average family size was six persons; most families had two children under five years of age; 12% included a pregnant woman, and 54% a nursing mother. On the other hand, 80% of the families were in the project because of an undernourished child, while only 8% because of pregnancy and 18% because of breastfeeding. After that assessment, the MOH decided to start a pilot plan to distribute a *family* ration to some beneficiaries. This ration, also distributed monthly, had 30 lb of rice, 10 lb of beans, 10 lb of powdered milk and 1 gallon of oil, equivalent to 3,860 kcal per family per day. While the monetary contribution requested from beneficiaries with *family size* rations increased to 5.00 "colones" (Salvadoran monetary unit) per month, those with *individual size* rations continued to pay 0.50-1.00 colón.

Considering that the distributed foods were shared among all family members (5, 6), the food impact on the beneficiary was probably negligible when individual size rations were distributed. To the recipient family, however, donated foods, aside from its strictly nutritional component, implied stimulation of other activities and budgetary savings (7). Even though donated rations obviously affected family food availability, this did not imply that they also modified the food intake of all family members (8-10). In fact, some evidence points out that within families there is some bias in food distribution according to status, sex and age (11-13).

Various factors may condition the use of donated food items at the household level: food type and quantity, versatility of its incorporation into known and accepted preparations, and perceptions of the food assessment in terms of prestige, habits and customs. The effect of donated foods on decisions regarding acquisition and intake of other food items, and on the quality of family and specific individual diets is also unknown.

In order to improve the effectiveness of feeding programs that distribute raw rations to be consumed at the household level, a greater and better knowledge is required of ways to prepare donated foods, its distribution among family members, its role as a supplement or substitute of other food items, and possible purchase, barter and exchange processes. Furthermore, it is necessary to know other aspects affecting people's perceptions of food assistance, such as any related education processes, the program's operation itself and the application of acquired knowledge.

The purpose of this study, therefore is to set forth the technical basis to define not only the most adequate ration type for the needs of the recipient population, but also the ideal contents and methods for educational programs that foster desirable changes in health, food and mother-child nutrition practices and attitudes at the family level.

2. Objectives

Research on intra-family use of donated foods had the following objectives:

2.1 General

To identify factors affecting household-level donated food handling and consumption in order to develop measures to improve children's diets and the effectiveness of the Mother-Child Feeding Program of the Salvadoran Ministry of Health, which may be applied to other similar programs in Central America.

2.2 Specific

a) To determine the food pattern of the families participating in the Mother-Child Health Project.

b) To understand the contribution of both family and individual size ration types to the energy and protein intake of the family and of children under five years of age in relation to their specific dietary needs.

c) To determine how beneficiaries typically preserve and prepare donated foods and the factors that facilitate or hinder its incorporation into the diet of the family, as well as the diet of children under five years of age.

d) To determine intake frequency and intra-family distribution of donated foods in both individual and family size rations.

e) To determine how both individual and family size rations contribute to the family food basket in terms of food contribution.

f) To understand the economic value represented by donated foods within the framework of the family food expenditure.

g) To identify family attitudes and behavior regarding donated foods in order to identify factors that determine its acceptability for its use and management within the Program's framework.

h) To identify --by means of cultural pattern studies of family food consumption-- new ways to implement the program that could strengthen donated food use in terms of improving family food security and meeting the objectives of this program.

i) To provide elements for new education methods that would result in better use and handling of donated foods at the household level.

j) To develope methodologies to implement studies such as this one in other countries of Central America.

3. Hypothesis

Hypothesis 1

The feeding pattern of the families, specifically the realtive intra-family food distribution (family-child), is not affected by the introduction of donated foods, independently of ration size.

Hypothesis 2

In the families that receive individual rations, the nutritive value of their food consumption, expressed as energy intake (kilocalories) *per capita*, is similar when there is donated food availability in the home, than when the rations received have been exhausted.

Hypothesis 3

In the families that receive the family ration, the nutritive value of food consumption, expressed as energy intake (kilocalories) *per capita*, is greater when there is donated food availability in the home than when rations received have been exhausted.

Hypothesis 4

Food consumption of children 13 to 59 months of age, expressed as energy intake (kilocalories) adjusted by age, is greater when the family receives a family ration, than when it receives individual rations, as long as the donated foods are available in the home.

Hypothesis 5

Even when there are some small substitutions, the family rations constitute a significant economic contribution, representing more than 20% of the family expenses in basic foods, considered as basic foods all the products that regularly contribute with more than 80% of the family's energy intake.

Hypothesis 6

The donated foods that are not considered especialties, when their availability is considered sufficient, are distributed within the homes in a non-selective manner. Its intra-family distribution, however, is subject to a selective mechanism when they are considered insufficient or when they are catalogued as "special foods"."

Hypothesis 7

The intra-family value and use that is given to each donated food item will depend on the characteristics of the family unit, according to type, structure and place of residence.

Hypothesis 8

The economic value or of change that is given to each donated food item, depends on the total food availability and on the product's cost in the local market.

Hypothesis 9

The use given to the donated foods to improve the diet of the target population of the Food Aid Program, is determined by information and acquired knowledge level of the persons in charge of the intra-family food distribution, through their participation in the teaching activities of the program.

Hypothesis 10

The selection criteria for the intra-family food distribution will vary according to the impact the program had on the persons in charge of the food distribution. The greater the influence, the distribution will be better according to individual needs.

4. Expected products

As a result of this investigation, an outline was proposed for obtaining the necessary technical elements to:

a) Adapt the rations to the type and quantity of food for the Mother-Child Food Program carried out by the Ministry of Public Health of El Salvador, as well as for other food interventions that use the course of action of giving raw food rations.

b) Design of methodologies and educational contents appropriate for the beneficiary population, specifically in the areas of food use, its preparation and conservation.

c) Prepare modules on education methodologies for the training of formal and non-formal personnel.

d) Develop an investigation methodology that will permit to carry out similar studies in other countries.

Even though the investigation has only been carried out in one food aid program, its results could be useful for other food programs that distribute raw food rations in the Republic of El Salvador, as well as for other food programs carried out in other countries of the isthmus, under similar circumstances, mainly the ones aimed at the mother-child groups.

The results of the investigation, will be published in national reports in reference to the study and in INCAP's technical reports, in a way, that they can be useful for people in charge of the planning and implementation of similar programs in Central America and also to the donating agencies that support such programs.

5. Methods

5.1 Target population

This study has as target population families that participated in the 1988 Mother-Child Feeding Program of the Salvadoran Ministry of Public Health (Project WFP/2317) living in the East and West regions of the country, where the pilot plan for family ration distribution was underway. At that time the project had a nationwide coverage of 130,000 beneficiaries, including 25,670 living in the target regions (3).

5.2 Research design

The research included three study areas: a) family perception of donated foods; b) family food availability; and c) food consumption of both family and the recipient child.

The design is based only on the food consumption component, since the other two, family perception and food availability, affect findings in the food consumption area.

The design (Diagram 1) takes into consideration two precise moments: the *first* one, when donated foods had just been received by the family, i.e., it had become available at the household level (D1), and the *second* one, immediately prior to the next ration, when it is assumed that donated foods had become exhausted (D2). Thus, the research focused on two elements: *ration size* (individual and family) and *donated food availability* (available or exhausted).

5.3 Unit of analysis

The *family unit* is analyzed bearing in mind the social unit concept based on consumption actions performed by a group of persons related by family bonds, sharing a common dwelling and food procurement, preparation and distribution (14-16). This concept was chosen because the study focused on intra-family decision-making processes regarding the use of common goods, where reciprocal rights and duties --associated with family ties-- come into play. The social role of the family's *principal woman* was also taken into consideration because it allowed for the establishment of an intra-family relationship scheme where the principal woman spoke for the group in areas related to the purposes of the study.

5.4 Study areas and variables

The study areas and variables, analyzed according to ration size and donated foods availability, were organized as follows:

Diagram 1

STUDY DESIGN

		Donated food availability	
		Available (D1)	Exhausted (D2)
RATION SIZE	Family size (FS)	X_1 Y_1 Z_1	X_2 Y_2 Z_2
	Individual size (IS)	X_3 Y_3 Z_3	X_4 Y_4 Z_4

X = Family diet.
Y = Child's diet.
Z = Family diet/child's diet ratio.

a) **Family unit perceptions of use of donated foods**

. Characterization of family units.

. Family customs regarding food related issues.

. Influence of the feeding program on the use of donated foods.

b) Contribution of donated foods to the family food basket

. Frequency of staple food consumption, including donated foods.

. Contribution of donated foods to weekly food consumption.

. Contribution of donated foods towards food expenses.

c) Contribution of donated foods to the quality of family food consumption and that of children under five years of age

. Food pattern of families and children under five years of age.

. Nutritional quality of the food consumed by families and children under five years of age.

. Contribution of donated foods to the dietary energy/nutrient levels of families and children under five years of age.

d) Intra-family food distribution

. Effect of donated food availability.

. Effect of family size, level of principal woman's schooling, and length of enrollment in the feeding program.

5.5 Sample

Sample size was based on the study design and on a preliminary estimate of 600 kcal intake variance per family member (17). The minimum significant difference (MSD) of the various alternatives was calculated[1]. It was found that more than 45 families would not allow a significant gain in the detection of a 200 kcal estimate difference. Considering the fact that repeated measurements were being analyzed, 72 families by ration type were included in the study.

The 144 families studied were selected as follows: 6 health posts --3 distributing individual size rations and 3 distributing family size rations-- were randomly selected in each region studied. In each of the selected health posts, 12 families participating in the feeding program were again randomly chosen taking into consideration the delivery date of the last ration

[1] Using the following formula: MSD = ± (DF of error 1; I-)Sj (18).

in order to arrange the first home visit soon thereafter. Selected families lived in urban centers where the health posts were located, or in rural communities nearby (districts and villages).

5.6 Data collection

a) Reference period

Three weeks was the reference period for each family, i.e., the time elapsed between ration reception and (supposed) exhaustion.

b) Method

Data collection used different instruments for interviews, direct measurements and observations. Food intake was studied using the **One-Day-Recall Method** comprising several home visits for the purpose of interviewing, observing and measuring amounts of foods prepared and, if possible, consumed. All data was recorded in previously coded and pretested forms. A special operative manual describes the method used in data registration (19).

c) Survey and supervision

Twelve research assistants were selected from 18 participants in a three-week training period. Ten were social workers and two social promoters; most of them had had previous experiences in household surveys. Three persons with a B.S. in Nutrition acted as supervisors and another person with a B.S. in Nutrition and Economics headed the field work.

d) Field work

Three teams, each made up of one supervisor, three research assistants and one driver, carried out all field work. Field work was planned according to work-load per research assistant, intake survey method, and the timeliness of each interview. Each research assistant collected weekly data on three families; completed and reviewed forms, sought complementary community information and delivered all research information to program's headquarters. Diagram 2 summarizes the work done by each research assistant at each home.

Diagram 2

WORK SCHEME IN EACH HOME

	FIRST DAY	SECOND DAY
MORNING	<u>First Visit</u> . Motivation . Case identification . Food consumption* (initial) . Direct observation	<u>Third Visit</u> . Food consumption* (final) . Influence of the feeding program**
AFTERNOON	<u>Second Visit</u> . Food consumption* (cont.) . Food procurement* . Direct observation . Interview of principal woman**	

* Repeated in the second phase.
** Done only in the second phase.

5.7 Data processing

The manual for the study describes in detail all procedures used in each data processing task (19).

a) Critical examination and coding

All survey forms were subjected to a careful review that started in the field and was completed at headquarters.

b) Data clearing

An analysis of data consistency was made prior to statistical analysis. Methodololy varied according to type of data.

c) Data analysis

Once data reliability was assured, all tabulations and statistical analyses required to proof the study hypotheses.

5.8 Data analysis

Data analysis was run taking the hypotheses into consideration. In each unit of analysis, analyses of variance were done with repeated measures of donated food availability, i.e., recently received or assumed to be exhausted. Analysis units were grouped according to family or individual size rations.

The analytical model for design for m individuals in each group or ration type was the following (20):

$$Y_{ijin} = \mu + \alpha_i + \pi_{m(i)} + \beta_j + \alpha_i\beta_j + \beta\pi_{jm(i)} \text{ where}$$

α_i (i = 1,2) was the effect of the family or individual ration type on food consumption.

$\pi_{jm(i)}$ was the variability or error in assessing effects by ration type (ERROR 1).

β_j (j = 1,2) was the difference in consumption according to food availability.

$\alpha_i\beta_j$ was the interaction between ration type i and food availability j.

The analytical model was tested with the PROC GLM procedure, SAS statistical PC program, version 6.03 (SAS Institute Inc. 1987) (21).

6. Organization of the study

The Salvadoran Ministry of Public Health and the Institute of Nutrition of Central America and Panama (INCAP) shared the responsibility of implementing the study. The former coordinated the study at the national level, provided the required facilities and transportation, and its Nutrition Division reviewed survey forms and drafted the final report. INCAP contributed financially and technically in the protocol elaboration, in the training and hiring of field work personnel, in data collection, processing, analysis and interpretation, and in the drafting and reproduction of the final report.

II. CHARACTERISTICS OF THE SAMPLE

1. Population studied

1.1 Sex, age and dwelling structure

The 144 families studied included a total of 1,015 persons, 52% females and 48% males. Out of 244 women in reproductive age, 18 (7.3%) were pregnant and 42 (17.2%) were

breastfeeding. Forty-eight percent of the study population was under 12 years of age, reflecting a young population with an age distribution structure similar to that of other less-developed countries. Furthermore, 50% of the sample fell within the mother and child group, 26% were children under five years of age, and an equal proportion were women in reproductive age. Both study groups, i.e., with family size and individual size donated food rations, had similar age distribution structures. Fifty-one percent of the population was considered rural and the rest urban. While the rural area had a higher proportion of children between ages five and 10, the urban area had a higher proportion of children under five years of age. According to ration size, it was found that 58% of the families with family size rations lived in rural areas, whereas in those families with individual size rations, this value was only 43%.

1.2 Schooling

Education aspects were considered in 606 persons over seven years of age (47% females and 53% males). Approximately 30% had three years of schooling, while 20% had six years, and around 11% had started high-school; the rest were illiterate. The illiteracy rate was slightly higher for women (35%) than for men (29%). There was practically no difference in schooling between the two groups studied.

1.3 Occupational and working situation

The occupation of 424 persons were studied. Fifty-eight percent of the males, 75% of whom were day laborers, 6% land owners and the rest land tenants, engaged in farming activities. Thirty percent of the males worked in non-farming areas such as laborers or non-agricultural day workers. In other words, approximately 80% of the males in the study were day workers of one type or another. Eighty percent of the women were engaged in house chores and the rest were mainly involved in domestic services. As with other variables, there was no significant difference in occupational profile by ration type. Thus, both study groups were considered to have homogenous populations.

1.4 Characteristics of children under five years of age

Of the 262 sample children under five years of age, over 50% were older than two and only 17% were under one; 52% were girls and 48% were boys. The nutritional status of 189 children was described on the basis of weight-for-age and z scores: over 60% showed weight-for-age deficits (below -2 SD). Twenty percent of them were considered at high risk of malnutrition and 3% at severe risk of undernutrition. Families with individual size rations (26.4%) had a higher proportion of children at high or severe risk of undernutrition as compared to families with family size rations (18.3%). Food consumption was studied in 144 children under five years of age (one child per family included in the study), with similar results in both family size and individual size ration groups: median age was 23 months; 80% were children of the family head, 18% were his grandchildren, and 2% were children of another relative.

2. Family Characteristics

2.1 Size and composition

Family units had an average size of 6.6 (± 2.3) persons. Families were classified according to size as: *small* (<6 persons), *medium* (6-7 persons) and *large* (>7 persons). In terms of kinship, families were described as: *nuclear* (composed of father, mother and children); *expanded nuclear* (composed of father, mother, children and other persons); *incomplete* (made up of single fathers or mothers and their children); and *expanded incomplete* (father or mother with children and other persons).

All the families included in the study show a proportional distribution in the three size categories. Even though among families receiving family size rations there was a greater number of medium size families (42%) as compared to those receiving individual size rations. Statistically speaking, this difference was not significant. According to kinship, 52% of families were nuclear and 35% are expanded nuclear families. Regardless of ration type, families with different sizes showed significant differences with respect to kinship: small and medium size families were almost exclusively nuclear.

2.2 Characteristics of the family head

Family heads were male in 88% of the cases. Their age ranges between 19 and 72 years, with a mean age of 38.3 years. Regardless of ration type, around 30% of all family heads were illiterate and 50% had only one or two years of school. Forty-eight percent engaged in agriculture, 70% of these as day laborers. There were no differences with respect to ration type. Fifty-four percent stated that they had permanent occupations, 40% temporary jobs, and 4% said that they were unemployed. It can be inferred from the above that most families in this study depended economically on farming activities, mainly as day laborers; thus, their income is determined by minimum rural wages in those areas.

2.3 Characteristics of the principal woman

The term *principal woman* as used in this study describes the role played by one of the house women *vis-a-vis* resource supply and management, including inputs for food consumption. The role of the principal woman is a key element in this research, since with regard to food consumption, her involvement as conveyor of traditions, beliefs and habits is decisive (14). Accordingly, it is her perception of the diet that determines all patterns and practices related to intra-family food use, including that of donated foods.

The principal woman is identified as the person who most frequently makes decisions in food purchase, preparation and distribution. In more than 80% of the families studied, one person was in charge of these activities. She was the one who takes care of small children, acting as mother (90%), and bringing them to the health services (89%). Eighty-two

percent of all women interviewed simultaneously played the role of principal woman and wife, while only 11% acted as principal woman and family head. On the average, principal women were 32.6 years old and were mothers to at least five children. Approximately one-third was illiterate and of the other two-thirds, only half have had at least one year of schooling. Most of them consider themselves as housewives, and a small proportion has another occupation outside their homes. No significant differences were found in these characteristics by donated food ration size.

2.4 Characteristics of dwellings

Dwellings are mainly adobe houses with tile roofing and earthen floors. Water came from public faucets (40%), rivers or streams (40%), or home faucets (20%); only 60% had latrines. Eighty-eight percent had a rudimentary elevated fire-wood surface, 5% cooked on the floor and the rest used some kind of stove. Only 45% had a fixed location for dining room and the rest ate in different parts of the house. Again, the home quality of families with family size rations did not differ from families with individual size rations.

2.5 Food related customs

a) Household members

The number of persons classified as household members ranged between 3-15 (with an average of 6.6 persons) per family. The figures correlated highly (0.97) with the number of family members. In very few cases some family members ate outside of the home. In a few other cases, the family shared meals with non-family members. Finally, there was practically no differences in the number of household members by ration size.

b) Food supply

The most frequent way of procuring food was purchase (34%) or purchase plus loans or gifts (31%). Even though the main occupation was farming, none of the families satisfied their needs with their own crops. Each family spent an average of 9.9-14.2 colones on food per day with an average of 1.4 persons contributing to the family food expenditures. In 67% of the cases, however, this responsibility fell upon one person.

c) Food handling

Information was collected only for certain foods through direct observation. Seventeen percent of the families stored food items directly on the floor; most of them (88%), nevertheless, kept food, particularly powdered milk, in closed containers. Over 70% stored donated foods in different places from the ones used for storing non-donated food items. In over 50% of the cases, food items and

kitchen utensils were not carefully washed and water generally was not boiled because it was not considered necessary.

More than 50% of the families had a fixed meal schedule, especially for small children. In over 70% of the cases, no special food was prepared for small children, who were fed regular family food.

III. RESULTS

1. Relationship between families and the mother and child program

1.1 Direct program beneficiaries

A total of 154 persons classified as direct beneficiaries of the Salvadoran Ministry of Public Health Feeding Program were identified in the 144 surveyed families: 136 children under five years of age, 14 breast-feeding mothers, and four pregnant women. Ninety-two percent of the families enrolled in the feeding program had only one beneficiary and most of them enrolled during the year of the study. Mean program enrollment time was 5.2 months, with a minimum of 1 month and a maximum of 33. While 74.2% of the families with family size rations had a 4-month program enrollment period, only 54.3% of those with individual size rations had participated that long; these figures were statistically significant.

1.2 Donated foods management and use

Regardless of food ration size, most families (79%) stated that they received donated foods on a monthly basis. In 80% of the cases the principal woman received the foods as the direct beneficiary or the beneficiary's mother. Ninety-seven percent of the families contributed regularly between 0.35 and 5.80 colones per month (mean contribution: 3.1 colones), to the feeding program. Sixty-seven percent of all women interviewed expressed that those fees were justified and 26% even considered them low in view of the actual cost of the donated foods. On the average, surveyed women with family size rations stated that in the last ration they received 8.4 lb of beans, 23.8 lb of rice, 10.4 lb of milk and 4 bottles of oil; and the women that received individual size rations 9.7 lb of rice, 2 lb of beans, 2 lb of milk and 1 bottle of oil. Some women considered the ration to be incomplete because beans (17%), milk (15%), rice (13%) or oil (2%) were missing. With the exception of beans, products of the family size rations lasted 3-4 weeks; conversely, all products of the individual size rations lasted less than 15 days.

Donated products were seldomly sold or exchanged. This fact appeared to confirm their acceptability. Some persons indicated that they had rejected powdered milk because of digestion

problems. When asked whether other families threw away, exchanged or sold donated food items, women surveyed answered that it happens only when people do not need the food or do not like it. In any case, women stated that they would eat less (49%) and would have to buy more food (48%) if they didn't receive donated foods, thus reflecting the importance attributed to these goods. Only 6% mentioned that some of the donated foods items spoiled, generally because of humidity or grubs. Out of 144 interviewed families only 16 had previously received foods from other feeding programs, generally irregular ones.

1.3 Relationship with the feeding program

Promotion by health care personnel accounts for the participation of 60% of all surveyed families in the Mother and Child Program. Seventy percent of the interviewees believed they are referred to the program because of the nutritional status of their child, 10% because of medical reasons, 3% due to financial reasons, while 17% did not know why. The program attempts to influence families through monthly talks and demonstrations to the beneficiaries' mothers. Only 60% of the interviewees attended these activities, 73% of whom stated the food and nutrition orientation is what they liked the most, while the scheduling and duration are what they liked the least about them. Both family groups showed no difference in the above-mentioned aspects.

1.4 Food and nutrition knowledge and practices

The interviewees knowledge on health, food and nutrition related subjects is an indicator of the influence probably exerted by the health post --and not necessarily the feeding program-- on them. The feeding program is, nevertheless, the magnet that most frequently draws women to health services. After surveying women on various aspects of health and food and nutrition, it was found that there were no differences between households with family size rations and households with individual size rations. Data was divided into two categories with the purpose of facilitating its analysis:

a) Care of children under five years of age

Mean weaning age in all surveyed families was 18.6 months; a significant proportion of 24-month-old children, however, continued breastfeeding. With the exception of meat, most weaning foods --mainly vegetables, fruits and eggs-- were started between 4-6 months of age. When children reached one year of age, most mothers fed them all available foods at the household level, while 20% refused to feed them meat. Over 60% stated that they did not prepare any special food for small children; they were fed regular family foods.

When asked how they identified undernourished children, most interviewed women answered that they did so by the child's low weight or by his low weight combined with behavioral changes; 11% were not able to answer, and 4% refered to signs of dehydration. Forty-four percent of the mothers believed that the most

important treatment for malnourished children is food, while 30% list foods and medical care.

Fifty percent of the mothers indicated that personal hygiene was necessary to prevent children from getting sick, while 41% mentioned food, as well as personal hygiene. Even though 98% of the mothers thought that vaccines were necessary to prevent diseases, only 47% of the families had completed the vaccination scheme for all of their children. Sixty percent considered food and oral rehydration salts important to treat diarrhea.

After mentioning the previous findings it was evident that the health post had affected the mothers knowledge regarding health related aspects. This does not imply, however, that mothers put that knowledge into practice. Thus, more than 50% of them did not boil drinking water because they did not consider it necessary, while 32% failed to do it for economic reasons.

b) Care of pregnant women and breastfeeding mothers

Fifty-five percent of the interviewees stated that pregnant women should improve their diet in order to give birth to healthy children. In this sense, 33% also considered that periodical checkups are important. Forty-four percent of the surveyed women pointed out that a good diet in general, was essential for nursing mothers, while 32% indicated that extra fluids should be added to her diet.

1.5 Knowledge on aspects related to the Feeding Program

a) Enrollment requirements

Interviewees asserted that low weight was the most important requirement for children, pregnant and breastfeeding mothers to enroll in the feeding program, and that only children required regular checkups. Thirty percent of the women were not aware of the requirements for them to become direct beneficiaries. This reflected the widespread identification of the feeding program with children, which coincided with the low proportion of pregnant women enrolled in it.

b) Preparation of donated foods

In all feeding programs that distribute raw foods, proper food preparation at the household level is a key element that must be taught to the recipients. This study attempted to determine whether women were familiar with the usual way of preparing powdered milk: only 6% were able to indicate correctly the adequate proportions and the manner of preparation, while 22% stated not to know how to prepare powdered milk. From the above mentioned it can be inferred that the training as such was not appropriate, or that the trainers assume that mothers

already know how to prepare donated foods and were putting that knowledge into practice. It is interesting to observe that when mothers were asked about other ways of preparing donated foods, over 50% could not mention any special preparation. Only 40% of the mothers who were aware of other recipes, mentioned rice and milk combinations, a fact confirmed by the actual food consumption study.

c) Information on home gardens

The feeding program foresees the promotion of home gardens; over 40% of the interviewees, however, were not aware of their usefulness and, even worse, some did not even know the term. Of those who knew about home gardening, 20% considered them useful to diversify or improve the diet and 33% considered them an economic resource to decrease food expenses.

1.6 Knowledge grading

Knowledge levels were analyzed in a semi-quantitative manner by weighing answers relatively, depending on their degree of completeness. A grade interval ranging between 0 and 53 points was established. Sixty-one percent of the interviewees scored between 27 and 39 points (considered insufficient), 26% scored over 39 points (considered acceptable), and 13% scored less than 27 points (considered extremely insufficient).

2. The role of donated foods in family food availability

The following are results from the one week study on family procurement of staple foods. In all families, the study was undertaken on both occasions established by the research design, i.e., when donated foods arrived at the household level and when they were assumed to be exhausted.

2.1 Frequency of staple food consumption

Regardless of ration size received and study moment, it was evident that most families (>85%) consume food items considered to be staple foods, such as maize, rice, beans and sugar. Other foods eaten less frequently, but nevertheless consumed by a significant proportion of families (60-80%), were bread, powdered milk and oil, including donated powdered milk and oil. Even though differences were not significant, both groups showed some diverging trends. The individual size ration group included a lower proportion of families consuming maize (82%), bread (63%) and powdered milk (65%) as compared to the family size ration group (93, 68 and 75%). Conversely, the proportion of families consuming liquid milk was higher when the ration was individual (34-25%). Coffee had been considered a customary consumption good. It was interesting to note, however, that the actual proportion of families consuming coffee was rather low. What most families drink as "coffee" was actually made from

roasted maize. Most people said that they did not eat meat or beans because of their high price, while they did not consume bread, lard or coffee because these food items were not part of their traditional diet.

Only maize and sugar were eaten every day of the week; the same applies to coffee in families consuming it. Conversely, even though oil and beans were part of donated rations, they were consumed less frequently, a behavior that can be explained as a way of making them last longer. Rice, also a donated food item, was only consumed on a daily basis by 45% of the families with family size rations and by 37% of the families with individual size rations. This fact draws our attention because in both ration types, rice is the product distributed in the largest quantities. This behavior was apparently due to the fact that people were not used to eating rice.

2.2 Contribution of donated foods to total food availability

One goal of this study was to find out how donated foods contribute to total food availability. For this purpose: a) the family procurement pattern of the four donated foods was determined; b) contribution of donated foods to total food consumption was calculated; and c) financial value of donated foods with respect to the total family food budget was defined.

a) Family food procurement pattern

The procurement pattern of the four donated food items differed significantly according to ration size. Thus, over 70% of the families receiving family size rations depended on donated milk and rice, and to a lesser extent, on donated oil, for their consumption of these items. On the other hand, only 34% of the same families depended on donated beans. Families with individual size rations supplied their milk needs in over 70% of the cases with the donation, but had to go to the market in order to obtain the other three products. It is interesting to note that although individual size rations included far less milk than family size rations, in both cases the families depended on donated milk.

b) Contribution of donated foods to total food consumption

In families with family size rations, donated rice and milk represented over 70% of all foods consumed during the research week. The same applied to milk in families with individual size rations. Even in families with family size rations, donated beans accounted for less than 15% of the total consumption of this legume. The differences found between both study moments for each ration type were not statistically significant; however, differences between rations were highly significant, with the exception of milk.

c) Financial value of donated foods with respect to the total family food budget

In families with family size rations, the value of donated foods represented 25% of the total food costs during the research week in which the study took place. In families with individual size rations, on the other hand, that proportion is only 12%. This difference is highly significant.

3. The role of donated foods in the diet of families and children under five years of age

One of the main purposes of this study was to determine the role of donated foods in the diet of recipient families and children, as well as to find out whether ration size affected diets and whether diets were altered when donated foods were assumed to be exhausted at the household level. The results reported in this section are key aspects of the investigation since they provide important information to implement Mother-Child Feeding Programs that use raw rations for home consumption.

3.1 Food consumption at family level

Table 1 shows that *per capita* food consumption in this study, with the exception of maize and beans, was slightly higher than the *per capita* food consumption in rural areas in 1976. From the same table it can also be inferred that milk, rice and oil consumption was higher in the families included in this research as compared to rural families of the 1988 Salvadoran National Survey. The difference is even greater when the rice consumption found in this study is compared to the 1988 national level. This shows that donated foods, regardless of ration size, did contribute to increasing daily family food intake.

Table 2 shows that milk was the only donated food item with significantly higher consumption in families receiving family size rations. Furthermore, maize and vegetable consumption was significantly higher in families with individual size rations, especially when rations were exhausted (Diet 2). It seems that families tended to complete their diet with these other products when donated foods were lacking, thus favoring food diversification.

When families had just received the ration (Diet 1), the consumption of all donated foods --with the exception of beans-- was greater than when the ration was exhausted. In both ration size groups these differences were highly significant. It is interesting to point out that once donated foods were exhausted at the household level, families with family size rations showed a slight trend towards consuming higher amounts of meat, vegetables and maize, while families with individual size rations tended to eat more eggs, vegetables and maize.

TABLE 1

PER CAPITA FOOD CONSUMPTION IN THIS STUDY VERSUS THE 1988 NATIONAL FOOD INTAKE SURVEY AND THE 1976 RURAL COMMUNITY SURVEY
(grams/person/day)

Food item	1976[1]	1988[2] National survey	1988_2 Rural survey	This study
Fluid milk[3]	179	209	179	223
Eggs	14	33	29	21
Meats	21	32	23	21
Beans	55	38	42	47
Rice	27	25	26	54
Corn (dry grain)[4]	283	246	295	277
Wheat flour[5]	6	38	24	23
Vegetables	21	124	124	106
Fruits	27	70	60	39
Sugars	29	40	39	46
Fats	9	20	16	21

1 INCAP, Rural Consumption Survey in El Salvador, 1976.
2 ADS, ESANES 1988.
3 Milk products in fluid milk equivalents.
4 Maize derivatives in dry grain equivalents.
5 Wheat derivatives in flour equivalents.

TABLE 2

PER CAPITA FOOD CONSUMPTION AT THE FAMILY LEVEL BY RATION SIZE AND DONATED FOOD AVAILABILITY, WHERE D1=AVAILABLE AND D2 = EXHAUSTED (grams/person/day)

Food Item	Family size ration		Individual size ration	
	Diet 1	Diet 2	Diet 1	Diet 2
Fluid milk[1]	305.1	226.2	249.4	121.4
Eggs	18.7	15.2	18.0	34.2
Meats	13.9	19.0	26.1	27.2
Beans	52.4	44.0	45.6	42.0
Rice	70.0	39.2	69.4	39.9
Corn (dry grain)[2]	237.0	263.8	288.8	319.3
Wheat flour[3]	20.1	21.7	28.6	25.0
Vegetables	66.0	92.8	130.3	211.3
Fruits	36.8	38.7	50.8	34.8
Sugars	46.2	36.5	52.6	50.7
Fats	28.5	16.2	26.3	15.4
Number of cases	72	68	71	68

[1] Milk products in fluid milk equivalents.
[2] Maize derivatives in dry grain equivalents.
[3] Wheat derivatives in flour equivalents.

3.2 Food consumption of children under five years of age

The children's diet was similar to the family diet (Table 3). Donated food intake tended to increase in cases with family size rations; the differences, however, found between both ration size groups were not statistically significant. It is worthwhile mentioning that when the family received individual size rations, meat and maize consumption tended to be slightly higher and fruit and sugar intake lower. Other consumption patterns for food were ingested similarly in both ration size groups.

Independently of the ration type, milk, beans, rice, sugar and fat consumption in children was higher when donated foods were available at the household level, as compared to the moment when donated foods were exhausted. The differences found between both times were highly significant, with beans being the only exception. When there was a shortage of donated foods, maize and vegetable consumption tended to increase slightly, but the differences were not significant, whereas they were in the case of consumption at the family level.

3.3 Frequency of food consumption

a) Milk products

Regardless of the ration size, over 25% of the families and children did not consume milk when donated foods were exhausted. On the other hand, when donated foods were available, milk consumption in families with family size rations was far greater than that of families with individual size rations. Median milk consumption in children was barely 28 grams in cases with individual size rations and donated foods avialable, while the same consumption increased to 168 grams in cases with family size rations and even to 372 grams when donated foods were also available. Thus, the role played by donated milk in children's milk consumption was considerable.

b) Eggs

Practically 50% of the families either did not eat eggs or had eaten them in very small quantities on the day of the study. In both ration size types, egg consumption tended to increase when donated foods were exhausted.

c) Meats

Over 50% of the families had not eaten meat on the day of the study. Here again, regardless of ration size, families that ate meat consumed slightly more meat when donated foods were exhausted.

d) Beans

Although all families included beans in their diets, 25% of the children did not eat them. It is also interesting to note that 25% of the families with individual size rations did not consume this staple food when donated foods were exhausted.

TABLE 3

PER CAPITA FOOD CONSUMPTION IN CHILDREN < FIVE YEARS OF AGE BY RATION SIZE AND DONATED FOOD AVAILABILITY, WHERE D1=AVAILABE AND D2=EXHAUSTED (grams/person/day)

Food Item	Family size ration		Individual size ration	
	Diet 1	Diet 2	Diet 1	Diet 2
Fluid milk[1]	458.4	321.3	427.9	176.8
Eggs	14.2	13.4	15.3	17.8
Meats	7.3	7.2	12.4	19.5
Beans	20.0	18.3	18.3	15.5
Rice	40.9	24.8	31.6	21.0
Corn (dry grain)[2]	69.8	70.9	70.7	84.2
Wheat flour[3]	23.5	25.6	21.9	18.7
Vegetables	39.0	58.3	60.0	54.5
Fruits	47.2	64.1	52.2	45.0
Sugars	52.8	47.6	44.6	38.0
Fats	13.7	8.7	11.7	7.1
Number of cases	72	68	71	68

1 Milk products in fluid milk equivalents.
2 Maize derivatives in dry grain equivalents.
3 Wheat derivatives in flour equivalents.

e) Vegetables and fruits

In spite of strong variations in produce consumption, 25% of the families in both ration size types had not eaten vegetables on the day of the study. For fruits, this proportion rose to 50%. Approximately 50% of children's diets included neither fruits nor vegetables, and the other 50% consumed them only in minimal amounts.

f) Cereals

All families had consumed rice on the day of the study, except those with individual size rations and when donated foods were exhausted. This statement

also applied to children with either ration size type. Twenty-five percent of the families had not included wheat derivatives, mainly bread, in addition to their diet on the day of the study. However, bigger quantities of bread and wheat derivatives were consumed when donated foods were exhausted in families with individual size rations. As expected, all families had eaten maize on the day of the study, but in bigger quantities when donated foods were exhausted.

g) Sugars

Sugar was present in all diets, although in smaller quantities when donated foods were exhausted, since its consumption was associated with other food items such as rice and milk.

h) Fats

Donated oil was the main food product within this group. Therefore, fat intake decreases when there was a shortage of donated foods. All families consumed it but in relatively small amounts.

3.4 Contribution of donated foods to the diet of families and children under five years of age

It can be stated that all food items distributed by the feeding program under study were part of the common Salvadoran diet. Even powdered milk was being progressively integrated into the diet. Thus, it was expected that donated foods would be easily incorporated into recipient family diets. Table 4 shows in percentages how donated food items contributed to the total consumption of those foodstuffs both in families and children.

In households with family size rations, where donated foods were still available, donated foods supplied between 57 and 87% of the family's and child's diets, rice having the highest value. This contribution, however, decreased to approximately 30% when donated foods were exhausted, with the exception of rice, which remained practically the same.

In households with individual size rations, donated foods contributed rather little to the diet, with the exception of rice, which supplied over 50% of the diet when donated foods were available. The dietary contribution of beans and oil was negligible when rations were exhausted. In this regard, it must be borne in mind that the consumption of beans showed almost no variation among the different diets. In other words, since beans were a staple food, families found other ways of procuring them. Total oil consumption did decrease when rations were exhausted; thus, one could conclude that donated oil acted as a dietary supplement, while beans acted as a dietary substitute and had a noticeable impact on the home economy.

TABLE 4

CONTRIBUTION OF DONATED FOODS TO TOTAL FOOD CONSUMPTION IN FAMILIES AND CHILDREN UNDER FIVE YEARS OF AGE BY RATION SIZE AND DONATED FOOD AVAILABILITY, WHERE D1=AVAILABLE AND D2=EXHAUSTED, (in percentage of cases)

Food item	Consumption	Family size ration		Individual size ration	
		Diet 1	Diet 2	Diet 1	Diet 2
Milk	Family	61.1	35.1	29.4	10.5
	Child	57.0	34.3	27.7	10.8
Beans	Family	71.4	32.1	11.3	4.4
	Child	58.4	25.7	12.1	2.9
Rice	Family	87.4	87.3	62.4	41.3
	Child	79.3	77.3	57.5	33.6
Fats	Family	72.2	38.6	33.8	4.8
	Child	67.8	36.4	30.1	3.6

4. The role played by donated foods in the diet of families and children under five years of age, in terms of nutritional quality

4.1 Energy intake

a) Family level

Regardless of ration size, *per capita* family intake covered over 95% of the family energy requirements when donated foods were available at the household level. On the other hand, when it was assumed that rations were exhausted, that proportion droped 15% in family size rations and 14% in individual size rations. Although differences between ration types were not statistically significant, they were highly significant within ration type, i.e., between diets with available donated foods and diets without available donated foods. There is no statistically significant interaction between rations and diets (moments) (see Diagram 1). With individual size rations, however, there was a trend towards lower energy adequacy values (see Figure 1).

Depending on their energy adequacy, family diets were classified as follows: acceptable (90-109% adequacy), potentially undernourishing (70-89% adequacy),

and undernourishing (<70% adequacy). Table 5 shows family distribution according to this classification.

Table 5 shows that the proportion of families with undernourishing or potentially undernourishing diets increased significantly when donated foods were exhausted. Approximately 40% of the families had reduced their energy intake when donated foods were exhausted, demonstrating its importance. Regardless of ration size and donated food availability at the household level, cereals supplied 60% of the family diet caloric content, whereas animal products, beans, sugars and fats each supplied less than 10%. Fats contributed slightly over 10% only in households with family size rations and available donated foods.

FIGURE 1

EFFECT OF RATION SIZE AND DONATED FOOD AVAILABILITY ON ENERGY INTAKE OF FAMILIES AND CHILDREN

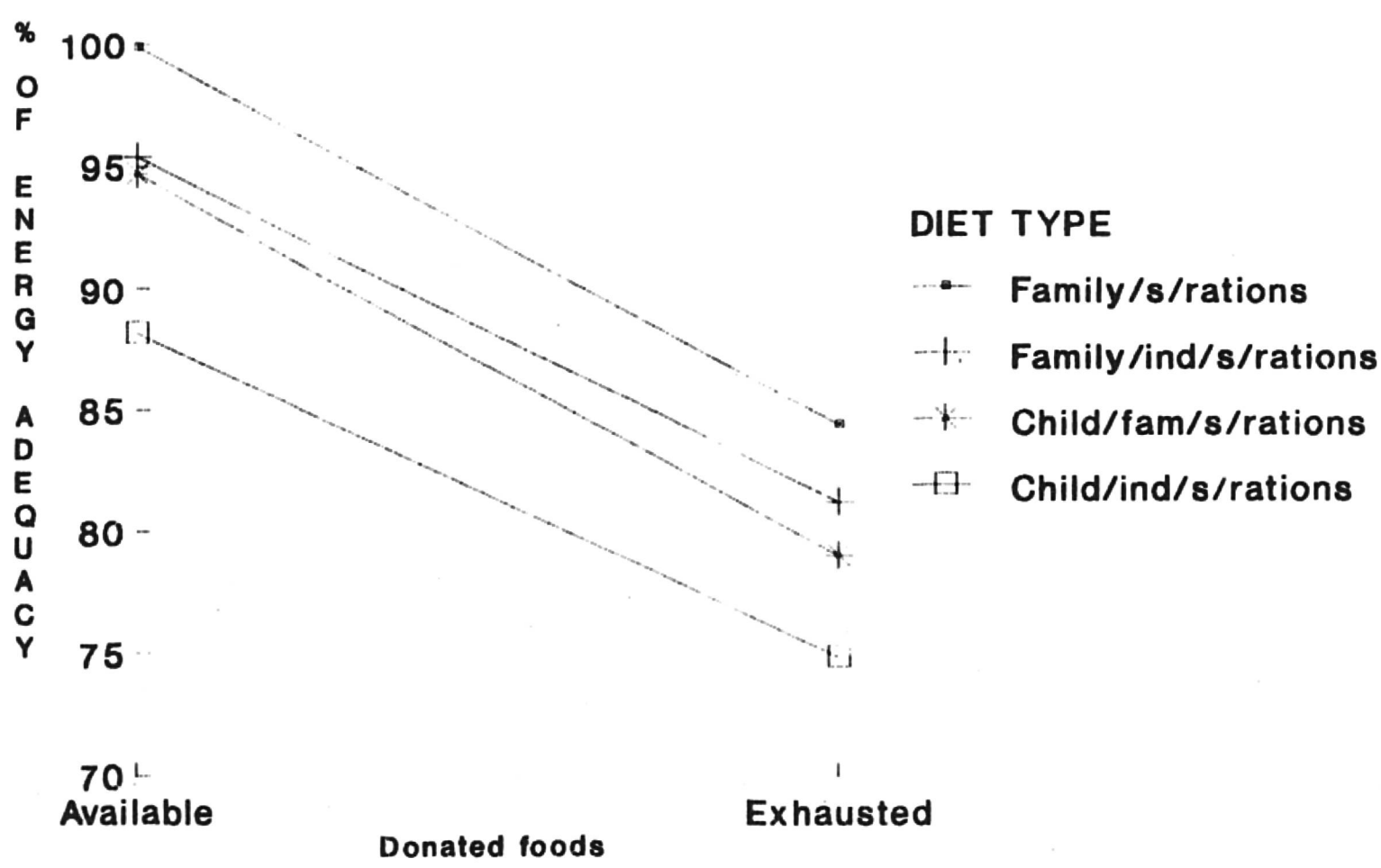


TABLE 5

DISTRIBUTION OF SURVEYED FAMILIES BY PERCENTAGE OF ENERGY ADEQUACY, RATION SIZE AND DONATED FOOD AVAILABILITY, WHERE D1=AVAILABLE AND D2=EXHAUSTED (in percentage of cases)

% of energy adequacy	Family size ration		Individual size ration	
	Diet 1	Diet 2	Diet 1	Diet 2
< 70	6.9	23.5	9.8	30.9
70 - 89	26.4	39.7	29.6	35.3
90 - 109	40.3	26.5	38.0	27.9
> 109	26.4	10.3	22.6	5.9
Number of cases	72	68	71	68

b) Diet of children under five years of age

Child energy adequacy varied depending on the ration size. Mean energy adequacy was 94.7% in households with family size rations, and 88.2% in homes with individual size rations, dropping to 79.1% and 74.9%, respectively, when donated foods were exhausted. In other words, children and family diets showed a similar energy adequacy reduction (Figure 1). While differences by ration size were statistically negligible, differences by donated food availability at the household level were highly significant. Even though no statistical differences were found by ration size, it was obvious that energy intake was lower when rations were individual size.

Table 6 shows the distribution of children according to energy adequacy values and ration size. Although the energy adequacy values for children showed a trend similar to that of families as a whole, the proportion of children with potentially or actually undernourishing diets was significantly higher. Thus, even when donated foods were available at the household level (Diet 1), 48 and 54% of all children in homes with family size rations and individual size rations, respectively, increased to 67 and 74% when donated foods were exhausted (Diet 2). These figures suggest that a great proportion of children had low energy intakes despite the availability of donated foods, a situation that becomes even worse with individual size rations. While differences observed within the group with individual size rations were not statistically significant, they were slightly significant in the group with family size rations.

Unlike the pattern observed in family diets, cereals supplied less than 50% of the children's energy intake, while animal products and sugars each supplied approximately 20%, and fats < 10%. These results were associated with a higher milk and sugar consumption in these children. In households with scarce donated foods and individual size rations, the dietary energy contribution of cereals increased significantly, while that of animal foods and sugars decreased, reflecting the effect of donated foods on the diet quality of recipient children. In this context, sugar consumption droped because milk consumption decreased, causing a further reduction in the energy intake of these children. It is worthwhile mentioning that regardless of ration size and donated food availability at the household level, in children, beans supplied a constant percentage of their dietary caloric contents. Apparently, it was customary to feed children beans only in small portions.

TABLE 6

DISTRIBUTION OF CHILDREN < FIVE YEARS OF AGE BY ENERGY ADEQUACY, RATION SIZE AND DONATED FOOD AVAILABILITY, WHERE D1 = AVAILABLE AND D2 = EXHAUSTED
(in percentage of cases)

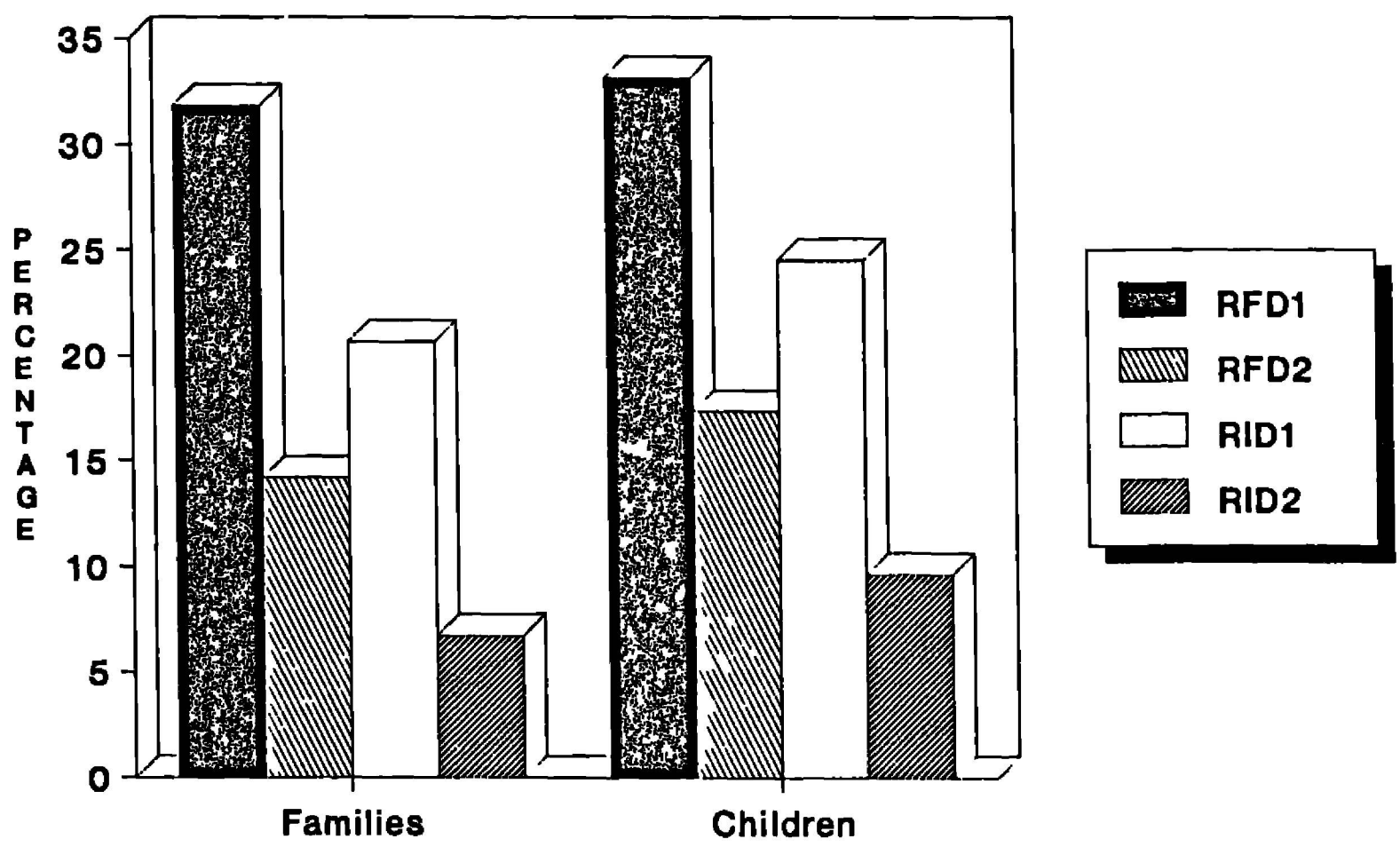
% of energy adequacy	Family size ration		Individual size ration	
	Diet 1	Diet 2	Diet 1	Diet 2
< 70	24.6	43.0	34.8	43.9
70 - 89	23.2	23.7	18.8	30.3
90 - 109	20.3	18.5	27.5	16.7
> 109	31.9	14.2	18.9	9.1
Number of cases	69	65	69	68

c) Contribution of donated foods to energy intake

When distributed in family size rations and available at the household level, donated foods supplied over 30% of the calories in the family diet, but only 20% when distributed in individual size rations. In both cases, this proportion decreased more than 50% when donated foods were exhausted (Figure 2). In children, donated foods supplied a higher proportion of energy intake (5% more) as compared to families, with the effect of ration size and donated food availability remaining the same.

FIGURE 2

CONTRIBUTION OF DONATED FOODS TO THE ENERGY INTAKE OF FAMILIES AND CHILDREN < FIVE YEARS OF AGE,
(In percentages of cases)



RF-Family/e/ration RI-Individ /e/ration
D1-Donated food availabity
D2-Donated foods assumed to be exhausted

4.2 Protein intake

a) Family level

Mean adequacy of total protein intake exceeded 90% only in cases when rations were family size and donated foods were available. Nevertheless, more than 40% of the families meeting these conditions did not reach that level. When donated foods were scarce, the proportion of families with low protein adequacy levels rose to approximately 65%. See results in Table 7.

Regardless of ration size and donated foods availability at the household level, cereals supply over 50% of the family dietary protein, and animal products a little more than 20%. When the ration was family size and there were donated foods available at the household level, legumes accounted for a slightly higher percentage of protein intake.

TABLE 7

DISTRIBUTION OF SURVEYED FAMILIES BY PROTEIN INTAKE ADEQUACY, RATION SIZE AND DONATED FOOD AVAILABILITY WHERE D1=AVAILABLE AND D2=EXHAUSTED (in percentage of cases)

% of protein adequacy	Family size ration		Individual size ration	
	Diet 1	Diet 2	Diet 1	Diet 2
< 70	8.3	30.9	19.7	35.3
70 - 89	37.5	35.3	32.4	27.9
90 - 109	23.6	23.5	25.4	30.9
> 109	30.6	10.3	22.5	5.9
Number of cases	72	68	71	68

b) Diet of children under five years of age

While in both ration types child protein intake showed a mean adequacy of over 90% when donated foods were available, this proportion droped 20% when donated foods were exhausted. From analyses of child distribution by protein intake adequacy (Table 8), it was found that even when donated foods were available at the household level, over 55% showed protein adequacy levels under 90%. This proportion exceeded 70% when donated foods were exhausted. Thus, it is again substantiated that children were most affected when food availability decreased at the family level.

In children, as opposed to families as a whole, cereals and animal products each supplied around 40% of protein intake, with a small reduction in animal products contribution when donated food was exhausted at the household level. Legumes supplied approximately 14% of the protein intake in children regardless of ration size and donated food availability.

c) Contribution of donated foods to protein intake

In children, donated foods supplied a higher percentage of protein intake, since practically all donated milk was used in child feeding. Even when donated rations were exhausted, donated foods supplied 20% of children's proteins (Figure 3).

TABLE 8

DISTRIBUTION OF CHILDREN <FIVE YEARS OF AGE BY PROTEIN INTAKE ADEQUACY, RATION SIZE AND DONATED FOOD AVAILABILITY WHERE D1=AVAILABLE AND D2=EXHAUSTED
(in percentage of cases)

% of protein adequacy	Family size ration		Individual size ration	
	Diet 1	Diet 2	Diet 1	Diet 2
< 70	33.3	47.0	38.0	51.5
70 - 89	22.2	25.0	22.5	23.5
90 - 109	18.0	8.9	15.5	14.7
> 109	26.5	19.1	24.0	10.3
Number of cases	72	68	71	68

4.3 Vitamin and mineral intake

a) Vitamins

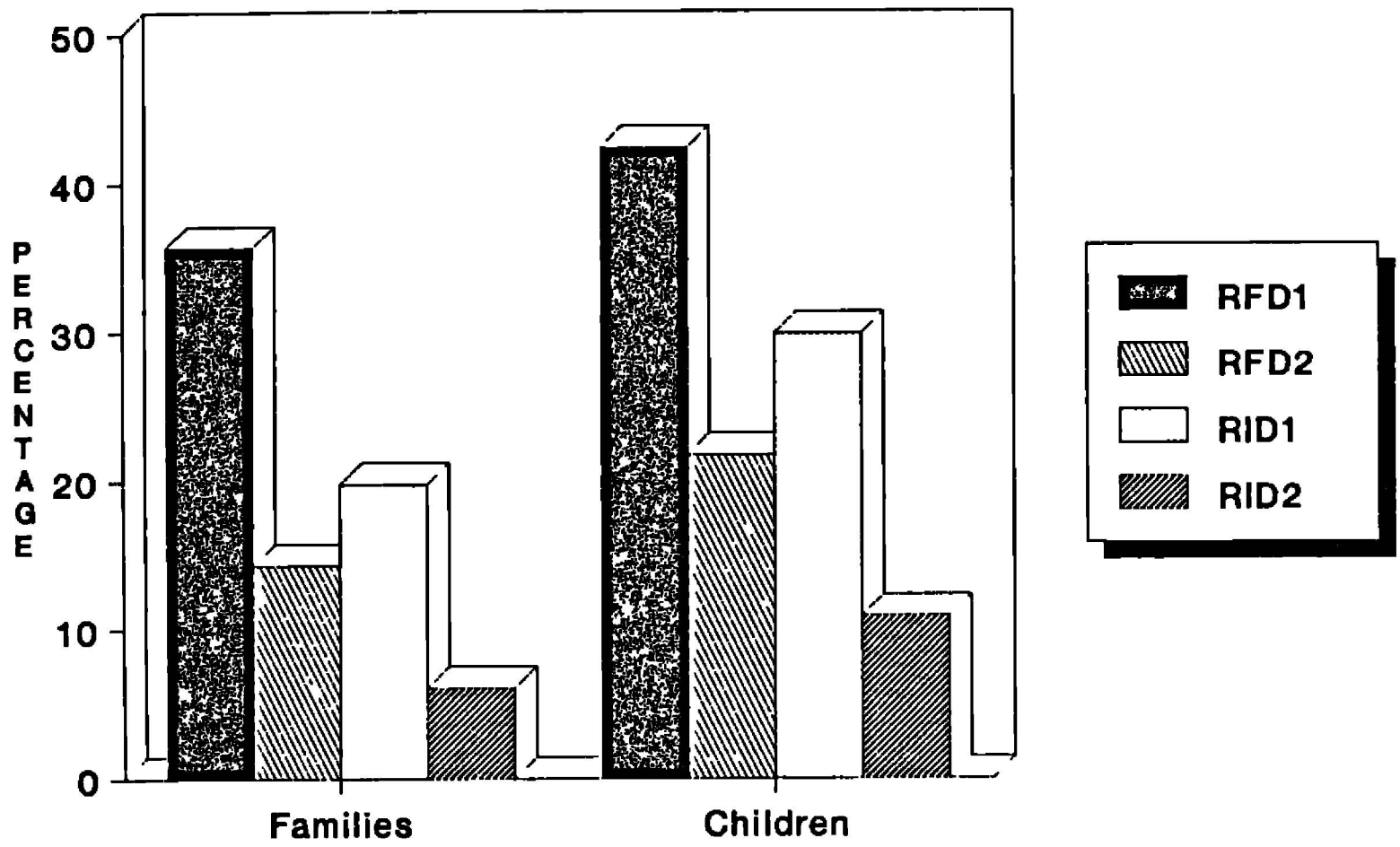
In family diets, only thiamine reached acceptable levels in both types of ration sizes. All other vitamins had adequacy levels under 75%, with vitamin A showing the lowest level (35%). Approximately 80% of the families showed vitamin A adequacy levels of less than 40%, reflecting a severe vitamin A deficiency. It must be pointed out that non-fortified powdered skim milk was used in all food analyses since it was not certain that donated milk had been enriched. Aside from thiamine, riboflavin, also showed acceptable adequacy levels in children, except in cases with individual size rations and when donated foods were exhausted. Vitamin A adequacy levels were also the lowest in children's diets.

b) Minerals

Calcium intake adequacy exceeded 100% in families, regardless of ration size and donated food availability. Conversely, in children calcium adequacy decreased when donated foods were exhausted because, unlike adults, whose calcium intake was almost entirely derived from "tortillas" made with maize cooked with limestone, their calcium intake depended on donated milk as well. Iron intake was very low both in families and children: under 50% in the former and under 65% in the latter. Donated foods had no effect on this nutrient.

FIGURE 3

CONTRIBUTION OF DONATED FOODS TO THE PROTEIN INTAKE OF FAMILIES AND CHILDREN < FIVE YEARS OF AGE
(In percentages)



RF-Family/s/ration RI-Individ /s/ration
D1-Donated food availability
D2-Donated foods assumed to be exhausted

4.4 Comprehensive analysis of diet quality

Table 9 shows that carbohydrates, proteins and fats supplied similar percentages of the total dietary energy in both family and child diets. These percentages were neither affected by ration size nor by donated food availability at the household level.

The dietary energy supplied by donated food protein varied between 11.0% and 12.4%, values that fall within the recommended range (20). Conversely, donated food fats supplied less than the recommended minimum (20%) and carbohydrates surpassed acceptable levels.

TABLE 9

CONTRIBUTION OF PROTEINS, FATS AND CARBOHYDRATES TO THE ENERGY INTAKE OF FAMILIES AND CHILDREN BY RATION SIZE AND DONATED FOOD AVAILABILITY, WHERE D1=AVAILABLE AND D2=EXHAUSTED
(In percentage of cases)

Nutrient	Diet	Family size ration		Individual size ration	
		Diet 1	Diet 2	Diet 1	Diet 2
Protein	Family	11.3	11.5	11.0	11.5
	Child	12.3	11.8	12.4	11.1
Fats	Family	18.9	16.1	16.7	15.3
	Child	18.7	17.7	17.5	16.6
Carbohydrates	Family	69.8	72.4	72.3	73.2
	Child	69.0	70.5	70.1	72.3

IV. EFFECT OF DONATED FOOD AVAILABILITY ON INTRA-FAMILY FOOD DISTRIBUTION, AND ITS INTERACTION WITH OTHER HOME VARIABLES

An important objective of this research was to find out whether the presence of donated foods affected the intra-family distribution of staple foods, and to understand how donated food availability interacted with some other home variables. This section analyzes the interaction between family and child in terms of *per capita* consumption of some foods, as well as energy intake. It also considers how family size, principal woman schooling and length of enrollment in the feeding program affected the energy intake of families and children.

1. Intra-family food distribution

1.1 Milk

Table 10 shows that regardless of ration size and donated food availability, the consumption of milk products (expressed as fluid milk) was higher in children than in families; statistically, this difference is highly significant. Children as well as families, however, consumed significantly less milk products when donated foods were exhausted and when

individual size rations were distributed. This phenomenon was more pronounced in children than in families. In other words, the presence of donated foods had a significant effect on the consumption of milk products, especially in children. Even though the ratio of family-to-child milk consumption was not altered by ration size, it was slightly modified when donated foods were exhausted, because at that time both groups tended to merge, indicating a preferential channeling of milk towards children.

1.2 Beans

Per capita intake of beans was 2.5 times greater in families than in children, a statistically significant difference. Unlike milk consumption, *per capita* intake of beans in families and children was neither altered by ration size nor by donated food availability at the household level. The ratio of family bean consumption to child bean consumption did not change either. In other words, the family distribution pattern was maintained, a phenomenon that could be explained by the fact that beans were a deeply-rooted component of the Salvadoran diet.

TABLE 10

PER CAPITA STAPLE FOOD CONSUMPTION: A COMPARISON BETWEEN THE FAMILY DIET AND THE DIET OF CHILDREN UNDER FIVE YEARS OF AGE BY RATION SIZE AND DONATED FOOD AVAILABILITY (grams/person/day)

Food item	Subject	Family size ration		Individual size ration	
		Diet 1	Diet 2	Diet 1	Diet 2
Fluid milk	Family	321.6	230.7	237.0	124.8
	Child	487.9	318.0	399.2	193.4
Beans	Family	51.7	45.4	46.9	41.7
	Child	19.1	18.6	20.3	15.5
Rice	Family	70.9	40.9	68.6	38.1
	Child	41.6	25.4	31.9	20.7
Maize	Family	234.1	274.7	287.9	304.3
	Child	66.7	72.8	74.3	82.2
Fats	Family	28.8	15.4	26.2	16.3
	Child	13.7	7.8	12.0	10.6
Sugars	Family	45.9	37.6	52.5	48.6
	Child	53.3	44.9	48.0	40.2

1.3 Rice

Per capita rice consumption is significantly greater in families than in children, a difference that increased when food rations were individual size. Statistically, however, ration size had no effect on intra-family food distribution of rice (family diet - child diet). In both groups, intake decreased significantly when the donated food ration is exhausted at the household level, especially in families. Thus, the ratio of family rice consumption to child rice consumption was significantly affected by the unavailability of donated foods. In other words, families benefited more than children from the presence of donated rice.

1.4 Maize

Per capita maize consumption was clearly higher in families than in children. In both families and children, maize consumption increased when donated foods were of individual ration size. It also increased when donated foods were exhausted, regardless of ration size. This means that other cereals, like rice, when available, decreased maize intake, i.e., substituted for it. However, the ratio of family-to-child maize consumption remained unaltered regardless of ration size and donated food availability at the household level. In other words, the same distribution pattern as in beans was observed.

1.5 Fats

In spite of ration size and donated food availability at the household level, *per capita* fat consumption was significantly greater in families than in children. Even though fat consumption was not affected by ration size, it decreased when rations were exhausted. This modification altered the ratio of family-to-child fat consumption, since both quantities were approximately the same. Thus, it can be stated that the presence of donated foods did alter intra-family distribution of fats.

1.6 Sugars

Per capita sugar consumption was similar in families and in children; in other words, all members within the family tended to consume similar quantities of this food product. Sugar consumption showed a slight decrease when donated foods were exhausted, a fact associated with a decrease in the availability of powdered milk.

2. Interaction of some home variables, ration size and donated food availability with the ratio of family energy intake to energy intake of children under five years of age

2.1 Effect of donated food availability

In children, energy intake adequacy levels were significantly lower than those of families, and although they were slightly lower with individual size rations than they were with

family size rations, the difference was not statistically significant (Table 11). When households had exhausted donated foods, energy adequacy values decreased in both groups in a similar and significant manner. Thus, the ratio of family-to-child energy intake was not altered by donated food availability.

TABLE 11

ENERGY INTAKE ADEQUACY LEVELS: A COMPARISON BETWEEN FAMILIES AND CHILDREN BY RATION SIZE AND DONATED FOOD AVAILABILITY (% of energy adequacy)

Subject	Number of cases	Family size ration		Individual size ration	
		Diet 1	Diet 2	Diet 1	Diet 2
Family	68	99.9	84.5	95.4	81.3
Child	68	91.3	75.6	85.5	72.7

Differences between family and child highly significant.
Differences between Diet 1 and Diet 2 highly significant.
Differences according to ration size not significant.

2.2 *Interaction of donated food availability with some other home variables on the ratio of family to child energy adequacy*

a) Family size

It has generally been considered that family size affects the food intake of its members. Table 12 shows the energy adequacy levels of families and children according to the three family sizes studied. Table 12 also confirms that energy adequacy in families was greater than in children and that it decreased when donated foods were exhausted. As family size increased, families showed a statistically non-significánt decrease in energy adequacy levels. Nevertheless, family size did interact with donated foods availability and significantly affected the energy adequacy values of both families and children. Family size, however, did not affect the family-to-child ratio with respect to dietary energy adequacy.

TABLE 12

ENERGY INTAKE ADEQUACY LEVELS: A COMPARISON BETWEEN FAMILIES AND CHILDREN BY HOME SIZE, RATION TYPE, AND DONATED FOOD AVAILABILITY (% of energy adequacy)

Family size	Subject	Family size ration		Individual size ration	
		Diet 1	Diet 2	Diet 1	Diet 2
< 6	Family	115.6	89.4	97.8	81.4
	Child	102.3	73.9	78.1	71.5
6 - 7	Family	102.2	83.1	97.1	86.1
	Child	81.0	67.6	86.8	77.9
> 7	Family	93.8	82.2	81.9	77.7
	Child	100.6	87.2	100.9	78.5

Differences between family and child highly significant.
Differences between Diet 1 and Diet 2 slightly significant. Differences according to ration size not significant.
Interaction between diet-family size highly significant.

b) Schooling of the principal woman

As already mentioned, the principal woman plays an important role in food decision-making. Table 13 summarizes the effect of the principal woman's schooling on family and child energy adequacy, as well as the interaction between them. It confirms the difference in energy intake between families and children, and shows that regardless of ration size and donated food availability at the household level, energy adequacy levels tend to be significantly higher when the principal woman was literate, differences that are statistically significant. Principal woman's schooling, however, did not alter the family-to-child energy intake ratio.

c) Length of enrollment in the feeding program

Table 14 confirms the energy intake differences between families and children that have already been pointed out in previous paragraphs. This Table also shows that the length of enrollment in the Mother-Child Feeding Program did not alter the energy adequacy levels of children and families. It also seems that the quality of the relationship between families and health post, did not alter recipients' behavior with respect to intra-family food distribution.

TABLE 13

ENERGY INTAKE ADEQUACY LEVELS: A COMPARISON BETWEEN FAMILIES AND CHILDREN BY PRINCIPAL WOMAN'S SCHOOLING, RATION TYPE, AND DONATED FOOD AVAILABILITY
(% of energy adequacy)

Schooling	Subject	Family size ration		Individual size ration	
		Diet 1	Diet 2	Diet 1	Diet 2
Illiterate	Family	97.1	84.7	92.0	72.4
	Child	76.5	64.6	81.8	60.5
Literate	Family	104.2	85.9	92.6	84.2
	Child	95.8	78.8	88.6	77.2

Differences between family and child highly significant.
Differences between Diet 1 and Diet 2 slightly significant.
Differences in schooling slightly significant.

TABLE 14

ENERGY INTAKE ADEQUACY LEVELS: A COMPARISON BETWEEN FAMILIES AND CHILDREN BY LENGTH OF ENROLLMENT IN THE FEEDING PROGRAM, RATION TYPE, AND DONATED FOOD AVAILABILITY
(% of energy adequacy)

Lenght of enrollment (months)	Subject	Family size ration		Individual size ration	
		Diet 1	Diet 2	Diet 1	Diet 2
< 4	Family	94.2	90.8	96.7	85.5
	Child	90.8	86.4	81.3	73.4
4 - 6	Family	106.5	84.7	91.5	78.9
	Child	89.3	74.8	102.5	78.8
> 6	Family	97.4	84.0	91.6	83.1
	Child	87.4	55.8	73.8	67.9

Differences between family and child highly significant.
Differences between Diet 1 and Diet 2 slightly significant.
Differences according to ration size not significant.
Relationship between diet and length of enrollment not significant.

V. CONCLUSIONS

Before presenting the main findings of this research, it should be mentioned that considering the socioeconomic crisis and armed conflict which affected the surveyed families, it would be risky to extrapolate these results to populations living under different conditions.

1. This study substantiated the role of the principal woman in decision-making regarding food purchase, preparation and distribution at the household level (14, 21). Since she was the person who had the most contact with the health post personnel, her behavior was more likely to be influenced by guidance offered at that location. She had acceptable knowledge of the program. Although she had an acceptable knowledge of some practices related to child health and nutrition, for one reason or another she did not implement them. It is speculated that the education methods applied in the feeding program were not able to modify the behavior of the principal woman, perhaps because home environment and dynamics were not taken into consideration.

2. Donated rations had a positive effect on family food availability, probably because of the poverty in which the survey families lived. Even though rice partially replaced maize, it increased cereal availability; oil increased fat availability; powdered milk increased the availability of animal products, and donated beans substituted, to a certain extent for beans that otherwise would had been purchased. It is interesting to observe that when donated foods were exhausted at the household level, the consumption of other foodstuffs, such as vegetables, fruits and eggs, was favored. It seemed that these food products lack the prestige attributed to donated foods. On the other hand, it must also be mentioned that donated rations, especially family size rations, contribute highly to the food budget, thus having an effect on the home economy. This latter aspect requires further analysis.

3. In feeding programs that distribute raw rations for home consumption, it was assumed that an increase in family food availability is automatically followed by an improvement in the food consumption of all family members. This study confirmed the accounts of other authors (12, 22-24) in the sense that small child diets are more deficient than family diets, a difference maintained even when donated rations are present. It is important to point out that the mothers who were interviewed were aware of the main purpose of the feeding program, as well as of practices that could prevent child undernutrition. However, despite the increase in family food availability and the channeling of part of the food received (milk and rice) to specific child preparations, the child energy intake was not satisfactory. On one hand, it seemed that mothers were not aware that children required more food. On the other hand, children apparently did not demand more food, thus getting used to eating small food quantities (25, 26).

4. With the exception of beans, donated food availability did affect intra-family food distribution. Obviously, donated milk is subjected to selective intra-family distribution criteria, since it was fed almost exclusively to small children and was identified as a

children's food. In view of the fact, however, that the family milk supply depended to a great extent on donated milk, ration size and milk availability at the household level affected child consumption and, therefore, also affected the child's diet quality. It is interesting to note that donated food availability at the household level apparently did not affect breastfeeding duration, a fact that could be explained by the rural traits of the study population, as well as by the influence of diverse and intensive breastfeeding promotion campaigns. Donated rice increased rice consumption in families and children; in the latter, rice consumption was associated with milk and sugar intake. Thus, a decrease in milk availability had a negative bearing on the consumption of the other two products. Finally, a greater availability of edible fat at the family level did not change the child's diet, probably because cultural patterns discourage fried food consumption among small children.

5. The effect that donated foods had on family and child diets is reflected by energy intake levels. In this sense, regardless of ration size, donated food availability at the household level increased the *per capita* energy intake in both groups significantly. Children, however, consumed less food and, therefore, always had lower energy adequacy levels as compared to families. Donated foods affected family diets because the surveyed families lived in poverty and extreme poverty, circumstances that resulted in better utilization of their resources. Energy adequacy levels decreased drastically when donated rations were exhausted, especially in households with individual size rations. This phenomenon seemed to occur cyclicly, which would lead one to suppose that the family intake would have been relatively low if donated foods had not been present. Several questions arise: What is the biological effect of these cycles? Do they improve the nutritional status of families or do they prevent the deterioration thereof? Finally, which family members do these cycles affect? It is imperative that these questions be answered in order to determine the biological impact of feeding programs.

6. Family size and length of enrollment in the feeding program did not influence energy intake of families and children, a fact already noted by other authors (27, 28). It is obvious that illiteracy of the principal woman negatively affected the energy intake of families and, especially children, a fact already reported in the literature (24, 29). This is a limiting factor to be borne in mind in all activities attempting to improve nutrition in small children.

Finally, it is worth mentioning that the findings of this study cannot be generalized neither to donated food items that are not part of the traditional food pattern, nor to periods when families have better physical, economic and social access to the food to which they are entitled.

VI. GUIDELINES FOR FUTURE RESEARCH STUDIES

1. It is important to have a better knowledge of the in-home duration of the different donated foods given periodically in the food assistance programs. This knowledge will help to explain the importance of the donated foods in the family food acquisition pattern, which will help decide in a more appropriate way, the content of the rations. This investigation can be carried out through a study of family food availability in several consecutive weeks.

2. The findings of the study performed in El Salvador refer to the effect of the donated food rations in the diet of the beneficiary families and children, when the given products are part of the customary diet of those families. In many other food assistance programs, non-traditional food rations are given, critics have been made to this type of activities; it is an essential point to know if the effect in the family diet differs between the use of distributed products that are not a part of the food pattern with respect to traditional products given in food assistance programs.

3. The possitive effect of the donated foods regarding the family diet in the case of El Salvador is explained due to the crisis situation of the economical and social conflict of the studied families. It is important to know the behavior regarding donated foods of poor families that live in other type of conditions or as a consequence of other circumstances such as the effect of structural adjustment measures, as it happens in many of the Latin American countries.

4. The study carried out in El Salvador refers to a single period, it proceeds to question if the findings present themselves in a cyclical way in the families and what is its effect in the children's nutrition. It is important to perform a similar investigation during a longer period in which several deliveries of rations are included.

5. The food disadvantages were verified in the study of the child under five years of age, related to their family as a whole. For activities in food and nutrition education, more knowledge is required in family dynamics that condition the intra-family distribution of the available foods, with emphasis in the youngest child, which is the target population of many food and nutrition programs.

6. Designing effective assistance programs or food aid, require more knowledge of the family perception of this type of actions. It is important to analize more thoroughly the relationship between the socioeconomical family characteristics and its response to the achievement of the purposes that these programs outline.

7. Some donated foods improve the availability of foods in the homes, others substitute the purchase of the same. This can be the case of many assistance programs or food bonus in which inquiries can be made about the destiny of the savings of the family budget. What criteria is taken in consideration to decide on the use of these savings?

8. Finally, it is obvious that the use of donated foods in the midst of the family respond to a series of qualities in each product. The appropriate selections of foods of a donated ration require more knowledge on the values that the products enclose for the families in a way that they are given a more efficient use.

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PROLOGUE

This paper is an abridged final report of the study ***Intra-Family Use of Donated Foods****, carried out in the Republic of El Salvador under the joint responsibility of the Salvadoran Ministry of Public Health and Social Welfare and the Institute of Nutrition of Central America and Panama (INCAP).*

María Teresa Menchú of INCAP's Food and Nutrition Planning Division coordinated the study and Olga Tatiana Osegueda of the Nutrition Department of the Salvadoran Ministry of Public Health headed the field work. Melba Zuniga, Honduran sociologist, and Ricardo Sibrián, INCAP's statistician, acted as consultants. Maribel de Tobar, Head of the Nutrition Department of the Salvadoran Ministry of Public Health, and Humberto Méndez of INCAP's Data Processing Center participated in the data analyses and report drafting.