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Food Consumption Patterns of Pregnant Women And Children (ECD Baseline Indicators Survey)

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Introduction

The report is an extension of the baseline report of the Early Childhood Development Project prepared by the Office of Population Studies (OPS) (Baseline Indicators Study Report, OPS). This report examines the levels of food consumption and nutrient intakes and adequacies of pregnant women and children one to six years of age who are residing in the program barangays of Regions 6 and 7 and in the control region, Region 8. It describes the dietary intake of these subjects whose households are of lower to middle socioeconomic.

The dietary intake of at-risk population groups, especially that of the pregnant women and children have been extensively studied and reported both internationally and locally. The results have shown that pregnant women are nutritionally at-risk due to the nutrition demand of the growing fetus aside from her own nutritional need. Poorly nourished pregnant women tend to deliver low birthweight babies and have inadequate milk production. Low birthweight babies have lower chances of survival. Children, on the hand, need adequate food intake for good health and normal growth. Children who are undernourished are unhealthy and weak. Oftentimes, they have delayed physical and mental development compared to the well-nourished children.

Results of the present study and that of the 4th National Nutrition Survey conducted in 1993 by the FNRI have many similarities. The FNRI report showed the diet of rice-fish-vegetable as the prevalent pattern (Philippine Nutrition Facts and Figures, 2001). Most of the macro- and micro- nutrients are still inadequate or even grossly inadequate (Philippine Nutrition Facts and Figures, 2001). The same patterns are shown in this report.

This report aims to compare dietary consumption of pregnant women and children 1 to 6 years old residing in the program barangays in the program regions with that in the control, Region 8, to see if there are baseline differences between the program and the control areas in terms of dietary patterns. In addition, it aims to describe the dietary similarities and differences between the program regions, Regions 6 and 7. Further, the findings of the report will aid the local government units (LGUs) in their evaluation and improvement of the ECD programs, particularly in the aspects of nutrition, in their respective areas of jurisdiction.

Methodology

The method used to collect information on the usual food intake of pregnant women and children was a 2-day 24-hour food recall. In the case of children, the mother/caregiver provided the information. During the interview, respondents were asked about the foods eaten the previous day, item by item beginning from the meal before breakfast, through to supper, including snacks. The foods eaten were then recorded which included descriptions, at what particular meal the foods were eaten, dish preparations, amount consumed and the household measures being used. All interviewers and office editors underwent training on the conduct of a 24-hour food recall method and the handling of the dietary information. The estimates on food intake represent the average of 2 consecutive days' intakes of the subjects. Consequently, the nutrient intake estimates represent the two-day average of nutrient intake of the subjects. Nutrient intake was determined based on the Food Composition Table (FCT) prepared by the Food and Nutrition Research Institute (FNRI) and had been modified at OPS. The FCT is a file of the nutrient equivalent of all food items commonly found in the Philippines. Modifications to the FCT included, among others, specific infant formula not yet found in the 1997 FNRI FCT. The nutrient analysis of the infant formula was based from the product labels. For other food items not found in the FNRI FCT and which have no available nutrient analyses, the nutrient analysis of the food item closest in quality and composition to that found in the FNRI FCT was used. To assess the dietary adequacy per nutrient, the Recommended Energy and Nutrient Intakes (RENI) also developed by FNRI was employed. In some instances, under reporting of nutrient intake may happen because the FCT used to convert food intakes into its nutrient content had not been updated to include selected vitamins and /or minerals that may have been added in the processing of the fortified foods consumed.

Children one to six years of age are included when determining estimates on food intake, except when estimating consumption of milk and products. This is because most infants are still being breastfed and estimating the true dietary intake of these children poses a problem. To estimate milk and products consumption, however, children at least six months old are included in the analysis to be consistent with conventions set by FNRI.

The term 'pregnant women' is used in this report to include pregnant women with no eligible child and pregnant mothers of eligible children (children aged 0 to 6 years old) at the time of the baseline survey.

Sample

The ECD baseline survey included four regions, namely, Region 6 (Western Visayas), Region 7 (Central Visayas) and Region 12 (Central Mindanao) as the program regions, and Region 8 (Eastern Visayas) as the control region. But for the purposes of this paper, Region 12 had been excluded. A total of 96 barangays spread over the 14 to 57 municipalities of the four to six provinces in each region have been included.

The survey identified more than 700 pregnant women in the sample barangays of Regions 6, 7 and 8. However, after dropping those residing in the nonprogram barangays of Regions 6 & 7 and those with no dietary information, a total of 625 or more than 89% of pregnant women have finally been retained and included in the dietary analysis.

Conclusion

Generally, the pregnant women and children one to six years old residing in the program and control regions have three regular meals daily. With a regular meal consisting usually of rice/corn or cereal products, fresh or dried fish and green leafy vegetables, the foods may not be varied to meet all the nutrients that the body need. The nutrient intakes are below the recommended daily allowances not only due to low quality diets but due to inadequate amounts, as well.

Important in the results is the identification of the age of gestation with which pregnant women are mostly at-risk to malnutrition. Towards the second and trimester of their pregnancies, pregnant women are at-risk to malnutrition more than those who are in their first trimester. Similarly, children who are younger are at-risk to malnutrition. With these results in mind, it is, therefore, recommended to focus more on the nutritional needs of these at risk groups. Appropriate interventions are necessary at the earliest possible time to minimize the risk not only to their health but to the fetus among pregnant women. Intensification of the Micronutrient Malnutrition Control (MMC) and other similar social services is essential.

References:

Nutritional Guidelines for Filipinos, 2000
Nutrition Facts and Figures
Proceedings on the 58th PAN Annual Convention, July 21-22, 2005
Philippine Journal of Nutrition, PAN 1997
Recommended Energy and Nutrient Intakes (RENI), 2002 Edition

The desirable contribution to total energy intake must be about 55 to 70% for carbohydrates, 20-30% for fat and for protein 10-15% (Nutritional Guidelines for Filipinos, revised edition 2000, FNRI). With about two-thirds of the total energy intake coming from carbohydrates, about 20% from fat and about 15% from protein, the energy intake of children 1 to 6 years of age and who are residing in the program regions meet the desired shares of the macronutrients for energy. The diets of children in the control region (Region 8) do not show such agreement: it is more of carbohydrates than fat, as shown in the table below.

Table 16. Nutrient Sources of Energy Intake of Children 1 to 6 Years of Age, by Program Areas, Baseline Survey

Nutrient source	Program area			Control area
	Region 6	Region 7	Both regions	Region 8
Total Energy (Kcal)	872	817	861	804
Carbohydrates (%)	66.1	67.6	66.4	71.3
Fat (%)	20.1	19.0	19.9	14.9
Protein (%)	13.8	13.4	13.7	13.7

The table below shows that protein and retinol in the diets of children residing in the program and control regions are predominantly of animal origin. In the program regions, the protein coming from animal is almost two-thirds compared to about three-fifths in the control region. On the other hand, iron in the control region is more of a non-heme iron compared to an almost half share coming from both plant and animal in the program regions.

Table 17. Plant and Animal Sources of Nutrient Intake of Children 1 to 6 Years of Age, by Program Area, Baseline Survey

Nutrient source	Program area			Control area
	Region 6	Region 7	Both regions	Region 8
Protein				
Total intake (gms)	29.8	27.1	29.7	28.5
Plant source (%)	33.6	40.1	34.8	39.5
Animal source (%)	66.4	59.9	65.2	60.5
Iron				
Total intake (gms)	7.3	6.8	7.1	6.3
Plant source (%)	46.7	59.7	49.2	59.0
Animal source (%)	53.3	40.3	50.8	41.0
Retinol				
Total intake (gms)	202.2	217.4	203.8	224.4
Plant source (%)	10.4	13.3	11.1	8.2
Animal source (%)	89.6	86.7	88.9	91.8

In the case of children, more than 11,000 zero- to six-year old children in the program and control regions have been recruited in the study. After dropping those residing in the nonprogram barangays and those with no dietary information, about 9409 children are included in the dietary analysis. The children with no dietary information are those exclusively breastfed or those whose mother/caretaker have not been interviewed because of refusal or inavailability during interview visit.

Statistical Analysis

The dietary data obtained during the household interviews have been encoded using ACCESS as the data entry software. Manual and machine validation of the data entries have been undertaken to ensure accuracy, after which the data have been converted to STATA form for statistical analysis. Analyses in this report were primarily descriptive.

Profile of the Respondents

Majority of the sample households resided in the rural areas. About three to four in every ten households have no access to electricity, and a little over one-third had unsanitary toilets and unsafe water sources. Almost three-fourths of the households in the control region had been consuming fortified food products compared to a lesser proportion in the program regions.

Table 1. Selected Household Characteristics*

Characteristics	Program Area		Control Area
	Region 6 (n=1,649)	Region 7 (n,205)	Region 8 (2,165)
Place of residence			
Urban	46.0	34.4	19.5
Rural	54.0	65.6	80.6
Source of lighting			
Electricity	70.4	70.2	57.8
Kerosene	29.5	29.3	41.9
Others	0.1	0.5	0.3
Source of drinking water			
Piped supply	38.4	65.9	40.7
Tube well	26.4	7.4	34.6
Deep well with pump	17.7	4.8	1.3
Deep well without pump	11.7	5.3	4.9
Spring/lake	5.4	10.6	17.7
Others	0.3	6.0	0.7
Type of toilet			
Flush	6.3	3.1	2.1
Water-sealed	63.5	70.4	73.5
Latrine	10.0	4.4	4.5
Open pit	8.6	2.1	1.1
Field/canal	10.9	19.7	18.1
Others	0.8	0.2	0.6
Location of toilet			
Inside house	36.2	25.9	33.1
Outside house	49.8	52.6	45.2
No toilet	13.9	21.5	21.7
Percent of households consuming commercial fortified foods	52.7	66.2	74.0

*lifted from the ECD baseline survey report

Anemia among pregnant women in the sample areas is severe and their participation in iron supplementation program is poor. With respect to the children, at least one-fourth in all the three regions is suffering from malnutrition while four in every ten are anemic. Participation in feeding programs is poor with only about one to two in every ten availing. Few of the children are still being breastfed.

Table 2. Characteristics of subjects*

Characteristics	Program Area		Control Area
	Region 6	Region 7	Region 8
Pregnant women			
Percent anemic	75.6	55.5	56.9
Percent not receiving iron supplementation	53.0	48.0	58.6
0 to 6 years old children			
Percent stunted	34.8	29.8	39.7
Percent underweight	30.9	22.5	33.0
Percent anemic	40.0	37.0	43.6
Percent not availing of feeding program	87.9	85.3	88.3
Percent still breasfeeding	19.9	18.0	18.2

*lifted from the ECD baseline survey report

Results & Discussion

Pregnant Women

The pregnant women in the program and control regions eat three square meals daily. With rice as the staple, a rice-fish-vegetable meal continued to be the pattern. In Region 7, corn is a staple for half of the pregnant women. The average food intake is higher in the program regions, especially Region 6, compared to the control region, Region 8. The average diet fall short of the recommended daily allowances for nutrients. The pregnant women who are on their second to third trimester of pregnancy have even lower dietary adequacy levels for most of the nutrients. Although grossly inadequate in most of the nutrients, results seem to show that the pregnant women, irrespective of the age of gestation, in the control region have even poorer diets than their counterpart in the program regions.

Meal Patterns

Almost all of the pregnant women eat three square meals a day (breakfast, lunch and dinner). On the average, pregnant women eat two snacks a day. More than half of the pregnant women in the program areas and one-third in the control region eat 'painit', which is a meal before breakfast. A few consider this meal as breakfast.

Table 14. Mean One-day and Percent Adequacy of Energy and Nutrient Intake of Children 1-6 Years Old by Program Area, Baseline Survey

Energy and nutrient	Program area			Control area
	Region 6	Region 7	Both regions	Region 8
Energy (kcal)	872 (70.7)	817 (66.4)	861 (69.8)	804 (65.0)
Protein (g)	29.8 (91.2)	27.1 (82.9)	29.3 (89.5)	28.5 (83.2)
Iron (mg)	7.2 (84.9)	6.8 (80.4)	7.1 (84.0)	6.3 (74.0)
Calcium (mg)	435.0 (83.6)	358.3 (68.8)	419.1 (80.5)	285.4 (54.7)
Thiamin (mg)	.34 (62.8)	.32 (59.0)	.34 (62.0)	.30 (54.0)
Riboflavin (mg)	.56 (103.9)	.47 (87.3)	.54 (100.5)	.42 (77.3)
Niacin (mg)	7.4 (113.6)	7.0 (108.3)	7.3 (112.5)	7.1 (109.2)
Ascorbic Acid (mg)	43.8 (146.0)	54.2 (180.8)	46.0 (153.3)	37.6 (125.4)

Figures in () are percent adequacy

The mean energy intake and adequacy levels of children by single age are shown in the table below. Compared to other age groups, the diets among children aged 1 year old in both the program and control regions are grossly inadequate. The diets of children three years of age and are residing in the program and control regions are 86% and 74% adequate, respectively, compared to other age groups.

Table 15. Mean One-day and Percent Adequacy of Energy Intake of Children 1-6 Years Old by Program Area and by Single Age, Baseline Survey

Age (years)	Program area			Control area
	Region 6	Region 7	Both regions	Region 8
Energy Intake (Kcal)	872 (70.7)	817 (66.4)	861 (69.8)	804 (65.0)
1	591 (55.2)	625 (58.4)	599 (56.0)	566 (52.9)
2	712 (66.6)	768 (71.8)	725 (67.7)	735 (68.7)
3	956 (89.4)	764 (71.4)	921 (86.1)	792 (74.0)
4	947 (67.2)	832 (59.0)	924 (65.5)	842 (59.7)
5	970 (68.8)	966 (68.5)	969 (68.7)	882 (62.6)
6	1038 (73.6)	993 (70.4)	1027 (72.8)	1000 (70.9)

Table 13. Percentage Distribution of Children 0-6* Years of Age and Mean Intake of Milk and Products by Program Area, Baseline Survey

Age (years)	Program area			Control area
	Region 6	Region 7	Both regions	Region 8
Taking milk and products	67.3 (27)	50.8 (24)	63.9 (27)	43.6 (23)
0	63.3 (67)	57.9 (36)	62.2 (61)	56.6 (36)
1	74.9 (28)	64.2 (30)	72.4 (28)	54.0 (26)
2	70.7 (20)	61.2 (26)	68.6 (21)	55.0 (24)
3	66.0 (22)	50.5 (22)	63.1 (22)	43.0 (20)
4	67.6 (22)	50.3 (16)	64.0 (21)	43.2 (22)
5	64.2 (21)	36.4 (19)	59.4 (21)	27.4 (18)
6	63.5 (34)	34.8 (15)	56.6 (31)	31.9 (18)
Not taking milk and products	32.7	49.2	36.1	56.4
Total N	2455	2977	5432	3671

*excludes younger than 6 months old, count is 306 children
() average consumption in grams

Nutrient Intake and Adequacy Level

As shown in the table below, the intakes of children in both program and control are short of recommendation for the macro- and most of the micro- nutrients except for niacin and ascorbic acid. Children in the program and control regions meet less than 70% of the daily energy requirement.

The mean one-day energy intake of children 1 to 6 six years old in the program regions is about 861 kcal or about 70% adequate as compared to that in the control region which is 804 or 65% adequate. Comparing program regions, Region has a higher energy intake (872 kcal with an adequacy of 71%) compared to Region 7 (817 kcal with adequacy of 66.4%). Protein intake of children in the program regions is about 90% adequate compared to a lower adequacy in the control (83%). Comparing program regions, the children in Region 6 have a higher protein intake (29.7 g) compared to that in Region 7. Also grossly inadequate among the nutrients is thiamin. Thiamin is important to the body since it helps release energy from the nutrients, thereby enhancing and supporting normal appetite and nerve function (Nutritional Guidelines for Filipinos, 2000). Aside from thiamin, the children in the control region have inadequate intake of calcium. Calcium as a macro-mineral regulates many of the body's biochemical processes. Calcium is needed to make the skeleton and teeth dense and strong (Nutritional Guidelines for Filipinos, 2000).

Table 3. Distribution of Pregnant Women by Type of Meal, Baseline Survey

Meal type	Program area			Control area
	Region 6	Region7	Both	Region 8
Before breakfast	64.9	50.1	62.3	28.9
Breakfast	99.5	99.1	99.4	99.6
Morning snacks	42.4	47.3	43.2	31.5
Lunch	100.0	100.0	100.0	99.9
Afternoon snacks	82.6	73.6	81.1	48.8
Dinner	99.8	100.0	99.8	99.4
Before bedtime snacks	2.2	12.1	3.9	6.2
Number of meals including snacks	5	5	5	4
Number of meals excluding snacks	3	3	3	3

The 'painit' meal usually consists of pan de sal and coffee with powdered whole milk and sugar. Breakfast is usually rice or corn and fish. Aside from rice, dinner is a combination of green leafy and yellow vegetables and fish as viand. But for lunch, a more varied composition has been observed with the addition of fruits as dessert to the combination of rice, green leafy and yellow vegetables and fish.

Table 4. General Menu Patterns of Pregnant Women by Region, Baseline Survey

Meal	Program Area			Control Area
	Region 6	Region 7	Both	Region 8
Before breakfast	Pan de sal,coffee with powdered milk and sugar	Pan de sal,coffee with powdered milk and sugar	Pan de sal,coffee with powdered milk and sugar	Pan de sal,coffee with powdered milk and sugar
Breakfast	Rice,fish	Rice/Corn, fish	Rice/corn,fish	Rice,fish
Morning snacks	Other cereal products,fruit	Other cereal products,fruit,beverages, sugars	Other cereal products,fruit	Other cereal products,fruit
Lunch	Rice,green leafy and yellow vegs., fish	Rice/corn, green leafy and yellow vegs.,fruits, fish	Rice/corn, green leafy and yellow vegs., fruits,fish	Rice, green leafy and yellow vegs., fruits, fish
Afternoon snacks	Other cereal products,fruits,beverages, sugars	Other cereal products,coffee, sugars	Other cereal products, fruits,beverages/coffee, sugars,	Other cereal products
Dinner	Rice,green leafy & yellow vegs., fish	Rice/corn,green leafy & yellow vegs., fish	Rice/corn,green leafy & yellow vegs., fish	Rice,green leafy & yellow vegs., fish

Food Consumption

The average food basket is a combination of rice, as a staple food, a viand of fish and vegetable dish that add variety to the meal. This is consistent with the results of studies conducted by FNRI (Philippine Nutrition Facts and Figures, 2001).

Consumption of energy-giving foods is higher in the program regions than in the control, but the reverse is true with respect to its proportion to the total food intake. Rice remained to be the staple food contributing about 49 to 56% of the 1042 and 920 grams of total food consumed by the pregnant women in the program and control areas, respectively. Intake of rice is highest in Region 6 compared to Region 7 and Region 8. Corn, on the other hand, is consumed highest in Region 7 (278 grams a day compared to 1 and 33 grams in Regions 6 and 8, respectively). Consumption of other cereal products such as breads and other bakery products is highest in Region 6 contributing about 9% of the total food consumed in the program areas. Starchy roots and tubers which are cheaper sources of staple foods have much lower share to total food consumption compared to costly foods such as other cereal products, a result not expected in areas predominantly rural and low- to middle- income households. Aside from a relatively high intake of other cereal products, consumption of starchy roots and tubers in Region 6 is almost twice as much the consumption in Region 7. With respect to the consumption of sugars and syrups, pregnant women in Region 7 eat more sweets than in Region 6. Among the energy-giving foods, fats and oils are consumed the least by the pregnant women.

Consumption of body-building foods among the pregnant women in the program and control regions are about the same, contributing almost one-fourth of the total food consumed daily. Fish is consumed almost the same amount daily by the pregnant women in the program and the control regions. Consumption of meat, on the other hand, is higher in Region 8 at 40 grams compared to 30 grams per day in the program regions. Poultry and products is consumed in less significant amount in both the program and control regions. Consumed in lesser amounts are eggs (10 and 6 grams per day), milk and products (6 and 5 grams per day), respectively. Consumed in lesser amount but is higher in the program areas is dried beans, nuts and seeds.

The so-called regulating foods, vegetables and fruits are consumed more in the program than in the control region. In the program regions, vegetables and fruits share about 15% of the daily food consumption, while in the control region, the same accounts for about 12%. Vegetable accounts for more than half of the total regulating food consumed by pregnant women in the program and control regions. Consumption of other vegetables such as okra and eggplants and other vegetables under this sub category accounts for more than 60% of the total vegetable consumption. Comparing program regions, the pregnant women in Region 6 consume more vegetables and products than their counterpart in Region 7. Consumption of fruits and products, especially other fruits, is highest in Region 7 compared to other regions. Its share is about 6% of the total food consumed by the pregnant women compared to about 4% in Regions 6 & 8.

The table below implies an increasing food intake among children one to six years of age, as they grow older. The intakes of children who are one year old are half that of the intakes of children who are six years old

Table 12. Mean One-day Food Intake of Children 1-6 Years of Age by Single Age, Baseline Survey

Food consumption/age group	Program area			Control area
	Region 6	Region 7	Both regions	Region 8
	Consumption (gms)			
Average Food consumed	541	548	542	534
1 year old	322	410	343	365
2	458	531	474	481
3	571	577	572	560
4	583	636	594	587
5	675	646	670	612
6	723	661	708	683

Milk consumption

Milk and products are the most important dietary sources of calcium because it provides highly absorbable calcium aside from being good source of protein (Nutritional Guidelines for Filipinos, 2000). Yet nutrition surveys reveal a declining intake especially among children (FNRI).

The table below shows a declining preference in milk and products among children, as they grow older particularly in the control region. High intake of milk is observed from age 6 months onwards until the age before they reach one year. It is not shown, however, whether the decline has been due to a naturally declining preference of milk and products among growing children (because intake of solids increases as they grow older) or due to the feeding practices of the mothers or caregivers.

About 64% of the children in the program regions are taking milk and products daily and less than half in the control, Region 8. In general, consumption of milk and products among children in the program regions is higher compared to their counterpart in the control region. Comparing program regions, Region 6 has a higher consumption of milk and products than Region 7. By age, intake of milk slowly tapers down until the age of five. In the program regions, intake increased when the child reached the age of six years old, but not in the control.

Table 11. Mean One-day Food Intake of Children 1-6 Years of Age by Food Group, Baseline Survey

Food group	Program area			Control area
	Region 6	Region 7	Both regions	Region 8
	Consumption (gms)			
Average food consumption	541	548	542	534
Cereals & products	326	372	335	377
Rice & products	260	183	244	305
Corn & products	6	131	31	17
Other cereal products	61	58	60	55
Starchy roots & tubers	5	6	5	11
Sugars & syrups	29	25	28	19
Fats & oils	4	4	4	4
Vegetables & Products	18	23	19	21
Green Leafy & Yellow	10	14	10	12
Other Vegetables	7	7	7	9
Canned & processed	n	2	n	n
Fruits & Products	31	26	30	20
Vitamin C Rich	7	5	7	2
Other fruits	22	19	22	18
Canned & processed	2	2	2	n
Fish, meat & poultry	57	45	54	52
Fish & products	21	20	21	29
Meat & products	27	20	26	16
Poultry	8	6	8	7
Eggs	11	9	11	5
Milk & products	52	25	47	20
Dried beans, nuts & seeds	6	9	6	3
Beverage	2	3	2	2
Alcoholic beverage	n	n	n	n
Chocolate beverage	2	3	2	2

n- less than one gram

Table 5. Mean one-day food intake of pregnant women by food group, baseline survey

Food group	Program area			Control area
	Region 6	Region 7	Both regions	Region 8
	Consumption (gms)			
Average food consumption	1054	984	1042	920
Cereals & products	659	612	651	610
Rice & products	561	265	510	519
Corn & products	1	278	48	33
Other cereal products	97	69	93	58
Starchy roots & tubers	37	20	34	33
Sugars & syrups	33	58	37	32
Fats & oils	9	7	9	6
Vegetables & Products	113	62	104	67
Green Leafy & Yellow	28	35	29	34
Other Vegetables	84	26	74	33
Canned & processed	2	n	1	n
Fruits & Products	53	84	59	43
Vitamin C Rich	8	17	10	2
Other fruits	38	62	42	40
Canned & processed	7	5	7	n
Fish, meat & poultry	109	92	106	107
Fish & products	59	43	56	50
Meat & products	29	37	30	40
Poultry	21	12	20	17
Eggs	10	11	10	6
Milk & products	6	13	7	6
Dried beans, nuts & seeds	21	21	21	6

Nutrient Intake and Adequacy Level

Pregnant women residing in the program and control regions fall short of the nutritional requirements of the essential nutrients. Inadequacy of nutrients becomes even profound as the pregnancy approaches its term, as shown in the table below.

In terms of energy, the mean availability of calories among pregnant women in the program and control regions is 1386 and 1195 kilocalories (Kcal), respectively, contributing more than half of the daily energy requirement of the pregnant women in the program and control regions. Based on the results of the 4th National Nutrition Survey conducted by FNRI in 1993, the figures fall below the national average of 1684 kcal (Philippine Journal of Nutrition, 1997: Vol. XLIV). However, comparing program regions, the mean one-day energy intake of pregnant women in Region 6 is 1439 kcal or about 308 kcal higher than in Region 7. This supplies about 70% of the recommended allowance for pregnant women in the region compared to about 55% in Region 7. Looking at the adequacy levels across age of gestation, the nutrient intake of pregnant women becomes even more inadequate as the pregnancies come to term. In the the program regions, particularly in Region 6, it is in the first trimester of pregnancy that the energy adequacy level among pregnant women is highest and gradually tapers down in the second and third trimester of pregnancy. A different scenario is presented in the control region wherein energy intake is grossly inadequate across gestation age.

The mean intake of protein among pregnant women in the program regions is slightly higher compared to that in the control region. In the program regions, protein intake is about 46 grams per day and is about 70% adequate. This is slightly higher compared to that in the control region (40 grams with an adequacy of about 61%). Comparing program regions, the protein intake of pregnant women in Region 6 is higher (48.0 grams and about 72% adequate) compared to their counterpart in Region 7 (39.3 grams and 60% adequate). With respect to the calcium intake, the pregnant women in the program regions meet on the average at least half of the requirement, but not for the pregnant women in the control region.

The intakes of iron, thiamin and riboflavin both for the program and control regions are grossly inadequate. Ascorbic acid intake in the control region is grossly below the required level but not for pregnant women in the program regions which is about 85% adequate. Low intake in ascorbic acid in the control region is a consequence of a low consumption of vegetable and fruit.

Food Consumption

The average food consumption of children 1-6 years of age in the program regions and their counterpart in the control region are about the same.

As shown in the table below, a bulk of intake comes from cereals and products, contributing about 66 and 72% of the total food intake in the program and control regions, respectively. Other major food groups eaten in higher quantities are sugars and syrups, fruits and products, and fish, meat and poultry and milk and products. Food groups consumed in lesser amounts are starchy roots and tubers, fats and oils, eggs and dried beans, nuts and seeds.

Rice continued to be the staple food among children. This is especially true for children residing in Regions 6 & 8. But for Region 7, rice and corn continued to be the basic. Intake of corn and products in Region 7 contributes about 39% or 131 grams of the 335 grams of total cereals and products consumption. While in Regions 6 & 8, contribution of corn and products is about 2 and 4 % respectively, of the total cereals and products consumed. Relatively costly foods such as breads and other bakery products contribute about 11% of the total food consumed by children in the program areas compared to only about 10% in the control. While the so-called cheaper quality foods, starchy roots and tubers is consumed more by children in the control region than in the program. With an average intake of 11 grams per day, starchy roots and tubers contributes more than 2% of the total food intake of children in Region 8 compared to a negligible share in the program region.

Intake of sugars and syrups is highest in the program area, especially in Region 6, compared to Region 8. A larger amount of fruits and products intake compared to vegetables is observed among children 1-6 years of age and who are residing in the program. Among the fruits and products, other fruits such as bananas are eaten more by children 1-6 years old compared to Vitamin C-rich fruits. Vitamin C-rich fruits are consumed more by children in Region 6 than in Region 7 and much more in Region 8. Vegetables and products, which is consumed in lesser quantity than fruits and products, contributes about 4% of the total food consumed by the children in the program and control regions. Among the vegetables, green leafy and yellow vegetables are eaten more.

Fish, meat and poultry contribute about 10% of the total food intake of children in both the program and control regions. The so-called prestige food, meat and products is consumed more in the program region than in the control contributing almost 50% of the total fish, meat and poultry consumption of children in the program regions. Comparing program regions, meat is consumed more in Region 6 than in Region 7. On the other hand, fish and products is eaten more by the children in the control area. With an average daily consumption of 29 grams, fish and products contributes 5% to the total food consumed or more than half of the total fish, meat and poultry consumed by the children in the control region. The share of fish and products to the total fish, meat and poultry intake of children is higher in the control region compared to about 39% in the program regions. Poultry is consumed in fewer amounts in the program and control regions. Egg, which is one of the good sources of calcium, is eaten more by children in the program areas than in the control areas. Children in the program region consumed more milk than in the control.

Table 9. Distribution of Children 1-6 Years of Age by Type of Meal, Baseline Survey

Meal type	Program area			Control area
	Region 6	Region7	Both	Region 8
Before breakfast	51.7	43.0	49.9	28.8
Breakfast	98.8	98.7	98.8	99.6
Morning snacks	58.4	65.2	59.8	51.3
Lunch	99.8	99.5	99.7	99.3
Afternoon snacks	81.2	79.0	80.7	62.8
Dinner	99.6	99.4	99.6	99.0
Before bedtime snacks	22.6	23.8	22.8	10.4
Number of meals including snacks	5	5	5	4
Number of meals excluding snacks	3	3	3	3

Having the 'before breakfast' meal is practiced by at least half of the children in the program regions compared to their counterpart in the control region, which is less than one-third. For some, the meal can be their breakfast. The meal consists of powdered milk drink (whole/skimmed) added with sugar and pan de sal. Snacks in the morning are usually cereal products like breads or biscuits, while afternoon snacks consist of powdered milk drink added with sugar in addition to breads or biscuits. The table below shows the usual food intake of the children 1 to 6 years old.

Table 10. General Menu Patterns of Children 1 to 6 Years Old by Region, Baseline Survey

Meal	Program Area			Control Area
	Region 6	Region 7	Both	Region 8
Before breakfast	Pan de sal,coffee with powdered milk and sugar	Pan de sal,coffee with powdered milk and sugar	Pan de sal,coffee with powdered milk and sugar	Pan de sal,coffee with powdered milk and sugar
Breakfast	Rice,fish	Rice/Corn, fish	Rice/corn,fish	Rice,fish
Morning snacks	Other cereal products,fruit	Other cereal products,fruit	Other cereal products,fruit	Other cereal products,fruit
Lunch	Rice,green leafy and yellow vegs., fish	Rice/corn, green leafy and yellow vegs., fish	Rice/corn, green leafy and yellow vegs., fruits,fish	Rice, green leafy and yellow vegs., fish
Afternoon snacks	Other cereal products,fruits	Other cereal products, sugars	Other cereal products,sugars, fruits	Other cereal products
Dinner	Rice,green leafy & yellow vegs., fish	Rice/corn,green leafy & yellow vegs., fish	Rice/corn,green leafy & yellow vegs., fish	Rice,green leafy & yellow vegs., fish

Table 6. Mean One-day and Percent Adequacy of Energy and other Nutrient Intake of Pregnant Women by Program Area and by Gestation Age, Baseline Survey

Nutrient intake/age of gestation	Philippines, 1993*,**	Program area			Control area
		Region 6	Region 7	Both regions	Region 8
Energy Intake (Kcal)	*1684 (87.8)*	*1439 (70.3)*	*1131 (54.7)*	*1386 (67.6)*	*1195 (58.0)*
First trimester		1682 (92.6)	1091 (59.3)	1566 (86.0)	1038 (56.0)
Second trim		1445 (67.8)	1143 (53.3)	1406 (65.9)	1339 (62.5)
Third trim		1265 (59.5)	1145 (53.3)	1239 (58.2)	1187 (55.5)
Protein (g)	*49.9 (106.2)*	*48.0 (72.3)*	*39.3 (59.6)*	*46.3 (70.1)*	*40.4 (61.3)*
First trimester		50 (75.1)	40 (61.0)	48 (72.3)	35 (53.7)
Second trim		54 (82.3)	41 (62.4)	53 (79.7)	43 (70.2)
Third trim		35 (53.8)	37 (56.3)	36 (54.3)	39 (55.5)
Iron (mg)	*10.1 (64.7)*	*11.8 (35.7)*	*9.8 (29.7)*	*11.4 (34.6)*	*9.2 (27.6)*
First trimester		12 (45.6)	11 (40.0)	12 (44.5)	8 (29.4)
Second trim		13 (37.5)	10 (29.3)	12 (36.4)	10 (29.6)
Third trim		10 (25.9)	9 (23.9)	10 (25.4)	9 (24.5)
Calcium (mg)	*390 (67.2)*	*467.0 (58.4)*	*377.8 (47.2)*	*451.6 (56.4)*	*342.6 (42.8)*
First trimester		703 (87.9)	363 (45.4)	636 (79.5)	298 (37.2)
Second trim		456 (57.0)	385 (48.1)	446 (55.8)	357 (44.6)
Third trim		327 (40.9)	380 (47.6)	339 (42.3)	363 (45.4)
Thiamin (mg)	*0.67 (68.4)*	*0.53 (38.2)*	*0.46 (32.8)*	*0.52 (37.3)*	*0.42 (30.0)*
First trimester		.46 (32.7)	.43 (30.7)	.45 (32.3)	.39 (28.0)
Second trim		.62 (44.6)	.46 (33.0)	.60 (43.1)	.44 (31.1)
Third trim		.44 (31.1)	.47 (33.7)	.44 (31.7)	.42 (29.7)
Riboflavin (mg)	*0.56 (57.1)*	*0.54 (31.6)*	*0.56 (33.2)*	*0.54 (31.8)*	*0.46 (27.1)*
First trimester		.53 (31.0)	.47 (27.6	.52 (30.3)	.43 (25.5)
Second trim		.59 (34.8)	.62 (66.3)	.60 (35.0)	.51 (29.8)

Third trim		.45 (26.5)	.56 (32.9)	.47 (27.9)	.44 (26.0)
Niacin (mg)	*16.1 (88.0)*	*12.0 (66.9)*	*11.5 (63.7)*	*11.9 (66.3)*	*10.9 (60.6)*
First trimester		11.4 (63.2)	11.4 (63.2)	11.4 (63.2)	9.8 (54.4)
Second trim		13.6 (75.8)	11.9 (66.3)	13.4 (74.5)	12.9 (71.9)
Third trim		9.8 (54.6)	11.1 (61.6)	10.1 (56.1)	10.0 (55.4)
Ascorbic Acid (mg)	*46.7 (73.2)*	*69.5 (86.9)*	*58.6 (73.3)*	*67.6 (84.6)*	*34.7 (43.4)*
First trimester		90 (112.2)	55 (68.6)	83 (103.6)	34 (42.9)
Second trim		82 (101.9)	60 (74.7)	79 (98.4)	30 (36.9)
Third trim		36 (45.0)	60 (74.7)	41 (51.4)	40 (49.5)

Figures in () are percent adequacy
* Per capita nutrient intake and () percent adequacy
** data source: Phil. Journal of Nutrition , 1997

According to the FAO/WHO, the dietary carbohydrates in the different countries provide 40-80% of the total energy intake for man (Nutritional Guidelines for Filipinos, Revised Edition 2000). The source further says that based on the results of the study conducted by FNRI, the dietary carbohydrates provides about 74% of the total energy. In the present study, carbohydrates contributes about 72% of the dietary calorie in the diet of pregnant women in all sample regions. With respect to other energy sources, protein and fat contribute almost the same to the total energy intake. Results reveal that the diets of pregnant women in all the sample regions are predominantly carbohydrates.

Table 7. Nutrient Sources of Energy Intake of Pregnant Women, by Program Areas, Baseline Survey

Nutrient source	Program area			Control area
	Region 6	Region 7	Both regions	Region 8
Total Energy (Kcal)	1439	1131	1386	1195
Carbohydrates (%)	72.6	69.6	71.7	72.2
Fat (%)	14.2	16.3	14.8	14.1
Protein (%)	13.2	14.0	13.5	13.7

Iron intake is grossly inadequate and makes it even poor since a bulk of the iron intake is of plant origin. At least two-thirds of the iron intake in the program and the control regions come from plant, but the proportion in the control is lower than in the program regions. Iron intake in the control region is more of an animal origin compared to the program regions, particularly Region 6. Although still grossly inadequate, the iron adequacy level in Region 6 is slightly higher compared to other regions but is predominantly of plant source. It can be noted that iron of animal source is well absorbed in the gastrointestinal tract than coming from plant. Intake of iron-rich animal products and Vitamin C-rich foods is necessary to aid the absorption of non-heme iron or iron coming from plants. Hence, consumption of animal products is encouraged. Retinol, on the other hand, is more of an animal origin.

Table 8. Plant and Animal Sources of Nutrient Intake of Pregnant Women, by Program Area, Baseline Survey

Nutrient/source	Program area			Control area
	Region 6	Region 7	Both regions	Region 8
Protein				
Total intake (gms)	48.0	39.3	46.6	40.4
Plant source (%)	52.7	43.4	51.3	41.0
Animal source (%)	47.3	56.6	48.7	59.0
Iron				
Total intake (gms)	11.8	9.9	11.5	9.4
Plant source (%)	71.7	67.7	70.9	65.9
Animal source (%)	28.3	32.3	29.1	34.1
Retinol				
Total intake (gms)	196.6	343.7	221.8	223.0
Plant source (%)	17.2	10.5	15.4	9.5
Animal source (%)	82.8	89.5	84.6	90.5

Children

At this age group, children 1 to 6 years of age are prone to malnutrition. Both in quality and quantity, the children residing in the program barangays of Regions 6 and 7 and in the control region, have inadequate nutrient intake except for riboflavin, niacin and ascorbic acid. Results further reveal that children in Region 6 have more access to the relatively costly foods. These children have higher intakes of other cereal products, sugars and syrups, fruits and products, meat and products, egg and milk and products. Moreover, it is evident in the data that as children grow older food intake increased with a decreasing milk intake.

Meal Patterns

Almost all of the children have three regular meals. Usual breakfast consists of foods from the following major food groups: rice/corn or cereal products, fresh or dried fish. Lunch and dinner usually consist of rice or corn, green leafy or other vegetables and fresh or dried fish cooked either as fried or broiled or boiled but added with cooking oil/lard, as shown in Tables 9 and 10.