

THE RELATIONSHIP BETWEEN WOMEN'S ECONOMIC ACTIVITIES AND THE
ADEQUACY OF FEEDING THEIR PRE-SCHOOL CHILDREN: THE CASE OF HO
IN THE VOLTA REGION



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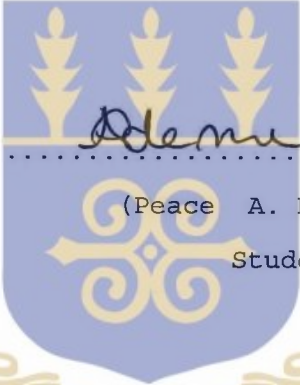
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D E C L A R A T I O N

I, Peace Abla Nora Denueme, hereby declare that except for references to other peoples' work which have been duly cited, this work is the result of my own original research and that this dissertation had neither in whole nor in part been presented for another degree elsewhere.



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Dedicated to the Glory of God who supported me throughout the course of the study.



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A B S T R A C T

The study examined the Relationship Between Women's Economic Activities and the Adequacy of Feeding their Pre-School children at Ho in the Volta Region.

The main aim of this project was to find out the relationship between the length of time mothers spent away from home and feeding adequacy which was assessed by growth performance of the children.

In all 70 working mothers with children aged 24 - 60 months were studied. A semi-structured questionnaire was used to collect demographic data whilst the frequency of consumption of commonly used Ghanaian foods was collected using the food frequency questionnaire. Nutrient intakes of the study children were assessed by the 24-hour dietary-recall method. Anthropometric measurements (weights and heights) were used to assess the growth performance of the children.

Using various statistical tools for analysis and presentation, the study revealed that children studied had diets that were low in calories, the group mean being 66% of the Recommended Nutrient Intake (RNI) for energy. The results showed that 27.1% of the children studied were malnourished (ie. they had weights for heights below - 2 SD). The low energy intakes of the children might probably account for the growth deficit.

There was a significant relationship between the lengths of time mothers spent away from home and the growth performance of their children.

It was clear that more of those children who showed signs of malnutrition were those whose mothers spent 9 or more hours away from home daily.

The main recommendations are that nutrition education be intensified for mothers of pre-school children. Secondly, Day Care Centres manned by qualified personnel be established at or near places of work to alleviate the feeding problems of pre-school children whose mothers work.

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CHAPTER ONE

1.1 INTRODUCTION

Children are the future leaders of nations so child nutrition and welfare have become a major concern of governments the world over. Recent reports by Ghana's Ministry of Health indicate that the result of a survey carried out on a sample of children 0 - 60 months revealed that over 50% of the children showed signs of malnutrition (Steel, 1989). The feeding practices a mother follows are a major factor in the nutritional well-being of the child. As the adage goes, "You are what you eat", so what a child becomes depends to a large extent on the type of foods and the way these foods are fed to the child.

Malnutrition, a result of poor feeding especially during the early years, has a lasting effect on the child. The most far-reaching effect of malnutrition is on the learning ability if the time of insult occurs at a crucial period of brain growth. The children may never attain their intellectual potential even if they are well nourished later. Another effect of malnutrition is the prevention of a child from attaining his full potential physical growth. These disabilities subsequently reduce productivity in adulthood.

In all cultures, women, among a host of responsibilities, are the providers of food as well as caretakers of children. In the past, Ghanaian women were involved in activities that kept them in and around the house. These included looking after the home, raising children and giving assistance with

farm work tasks which did not separate them from their young children. Their young children were therefore near so that they could easily feed and care for them.

However, as a result of rapid socio-cultural and economic changes women are now engaged in a number of different economic activities both in the modern and traditional sectors. Amuah (1986) and Aryee (1987) found that women in Ghana are involved in many types of economic activities ranging from top level managerial posts in the formal sector to farming and trading in the informal sector.

Often such job responsibilities of women leave them with very little time to spend with their children. Sometimes, the involvement in these economic activities take them away from home. The mothers therefore have to delegate most of the responsibilities of child care to other people. One such responsibility is feeding of the children for which the mother is ideally suited (Marshall, 1987).

Mothers' absence from home more often than not, has negative consequences on the health of the child. Most children in Ghana are started well because breast feeding is universally practiced, especially for the first few months of the child's life, during which time the child grows normally. From the onset of weaning the growth of most children slows down (Nutrition Division Report, 1989). This crucial period in the development of the child requires great attention. However, the involvement of mothers in economic activity

resulting in divided attention jeopardizes the child's well-being if she cannot provide satisfactory substitute care. After complete weaning the role of the mother is even greater. She has to prepare or purchase the food the child needs.

In most households in Ghana, mother and father work which results in an ever-diminishing amount of time either parent can spend with their children. From a study carried out by Kumekpor (1974) in Accra, 93 per cent of the women spent an average of 9 hours away from home daily. During their absence observation have showed that the feeding of their children may not be well-supervised, particularly when children are in the care of the aged, inexperienced maids and siblings.

In some cases where children can buy food for themselves, mothers give them money to do so. But these mothers lose sight of the fact that cooked food vendors do not prepare special dishes suitable for the nutritional needs of the children. Therefore, mothers involvement in economic activities may result in inadequate feeding of their children, which may have negative consequences on healthy development.

The aim of this study therefore was to investigate the effect of women's activities on the feeding patterns of their children and to evaluate the adequacy of their diets in meeting their nutrient requirements for normal growth.

1.2 STATEMENT OF THE PROBLEM

The pre-school years are crucial in the development of

children and also in the establishment of sound eating patterns for later years since food habits are shaped early in life. The pattern of feeding which a mother adopts during these years is greatly influenced, among other factors, by the time available to her. In view of the increased number of women entering the labour force and the high incidence of malnutrition among pre-school children, this study will examine the feeding practices and child care arrangements that working mothers make for their pre-school children (2-5 years) and also find out the relationship between these and the growth performance of the children.

1.3 OBJECTIVES

The following objectives were set:

1. To find out the general child feeding practices of working mothers at Ho.
2. To find out the usual food intakes of the study children and determine the adequacy of their diets.
3. To find out the child care arrangements that working mothers make for their pre-school children.
4. To assess the growth performance of the study children.
5. To find out the relationship between selected demographic characteristics of mothers and the growth performance of their children.
6. To establish the relationship between the hours working mothers spend away from home and the growth performance of their children.

1.4 THE HYPOTHESES

Ho1: There is no relationship between the mode of weaning and mother's occupation.

Ho2: There is no relationship between growth performance of the study children and their mother's educational level.

Ho3: There is no relationship between marital status of respondents and the growth performance of the study children.

Ho4: There is no relationship between the time mothers spent away from home for occupational purposes and the growth performance of their children.

1.5 SIGNIFICANCE OF THE STUDY

As a result of the worsening conditions of child nutrition and the ever-increasing number of women working and turning over child care responsibility to other people, it is timely to carry out this study in order to alert and create awareness in mothers of feeding problems that are likely to arise as a result of their pursuit of economic activities. This, it is hoped will help mothers improve upon the child care arrangements and feeding practices they put in place while they work.

The findings, it is hoped, will be useful to the Community Health Personnel who are involved in the education of mothers on child welfare issues.

Feed back of the results of this study will be sent to

The various women's organizations and movements in the Volta Region. It is expected that this will result in establishment of more day care centers and the improvement of existing day care facilities as well as the provision of nutritious meals for the pre-school children at the centers.

Very little or no work has been done in the Volta Region on the relationship between mother's involvement in economic activities and feeding of their pre-school children and so this study will provide an important information for the records.

1.6 OPERATIONAL DEFINITION OF TERMS AND CONCEPTS

Economic Activity : Is defined as work for which a person is paid directly or indirectly but not house keeping done in one's own home.

Formal Sector : Is the type of economic activity where employees work according to specified rules and regulations and within a rigid time schedule.

Informal Sector : Is the economic activity that include work of the self-employed and people who work within a flexible time schedule.

Growth Performance: Is the extent to which an individual follows the normal course of increase in weight and height (as indicated by NCHS¹ reference data) as a result of his or her nutrient intake.

¹ NCHS = National Center for Health Statistics.

2.0 REVIEW OF LITERATURE

A report from Ghana's Ministry of Health indicated that the number of malnourished children has doubled over the last decade. Data from various growth monitoring centers supported by Catholic Relief services have suggested that the malnutrition rates is worsening, with the percentage of under weight children having increased from 35 per cent in 1980 to 51 per cent in 1985 (Commey, 1990). A cross sectional study conducted in May 1988 of the nutritional status of 512 pre-school children at Gomoa Fetteh, Gomoa Onyadze/Ostew Junkwa showed that 2.9 per cent of the children were wasted (actually malnourished), 28.5 per cent were stunted (chronically malnourished), 27.7 per cent were stunted or wasted (under nourished), (Nugouchi Mem. Institute, 1987).

This occurrence could be attributed to absence of mothers from home because of job responsibilities. Scattered reports seem to suggest that more women in Ghana are involved in wage earning activities than used to be the case. The picture of women working in Ghana will not differ from that of other countries. In many countries working women now out-number those who stay at home. Of all women aged 15-64 years, the percentage who work are : France 55.7%, Germany 54.4%, Spain 39.4%, U.K. 63.5%, U.S.A. 66.9% and Japan 58.4% (Newsweek Magazine October, 1991).

Most working mothers as reported by Peil, (1975) and Aryee, (1980) have no facilities to allow the presence of children at or near their work places. This leads to their inability to

feed or supervise the feeding of their children. The hardships suffered by these children left by their mothers at very tender ages cannot be over-emphasized.

The literature reviewed covers the following topics:

1. Food and Nutrient needs of pre-school children.
2. Food Intakes of pre-school children.
3. Absence of mothers and welfare of their children.
4. Effect of mother's involvement in Economic activity on breast feeding.
5. Factors other than work that influence feeding of children.
6. Mode of weaning children.
7. Growth performance and its measurement.

2.1 FOOD AND NUTRIENT NEEDS OF PRE-SCHOOL CHILDREN

By the time children are two years old they will have learned to know and like most of the common foods that will be available to them throughout life. They may be less interested in food than formerly because of the many distractions at this age (Martin and Coolidge, 1978).

Although there is a slowing down of the rate of growth during this period, the pre-school child's body continues to change dramatically (Hamilton et al., 1988) indicating steady growth. Activity also increases as the child becomes increasingly mobile. It is a period that the pre-school child learns skills like counting, eating from spoon, talking and

walking. As activity increases after the child learns to walk, calorie needs increase. The pre-school years being a time of growth and development, the need for all the nutrients especially calorie is great (Hutchins, 1979). The pre-school child's requirement for energy in terms of body weight is about 3 times that of an adult. The energy is needed to maintain the rapid growth and meet their increased need for activity. A child within the pre-school period therefore needs 1560 calories per day (Hurdson, 1991). The pre-school child needs proteins for maintenance, repair and growth of new tissues especially muscles. As the child begins to walk and run his or her muscles must grow. This requires protein. Hurdson, (1991) reported that the pre-school child needs 25.9 g protein daily.

The need for vitamins, due to the rate of growth of the pre-schoolers is relatively high. The B-complex vitamins are especially high as they vary with energy intake, the higher the number of calories recommended the greater the amount of B vitamins needed.

Bone growth is rapid in the pre-school period so the need for calcium, phosphorus and magnesium are high. As the child grows the total amount of blood increases as a result, the need for iron is also high. The pre-school child needs 15mg iron daily to grow well. Energy, protein, calcium and iron are very important requirements for growth.

The pre-school child's meals could be chosen from the family meals. The various foods eaten by the other members of the family are usually suitable only the amounts and sometimes the form of the foods needs to be adjusted to meet the child's needs. Food should be prepared simply for pre-school children because they prefer to learn to enjoy individual foods for their own distinct flavours (Martin and Coolidge, 1978).

The pre-school child grows steadily and will need to be fed to obtain the necessary nutrients to support his growth. Since the child's capacity remains relatively small, one between meals snack may be needed between each of the three meals of the day. It is important to keep healthy eating guidelines in mind when selecting snack foods.

In Ghana the major body building foods include meat, fish, eggs, milk, beans, groundnuts, *agushie*, shell fish, crab and snails. Energy giving foods include maize, millet, rice, sorghum, cassava, yam, cocoyam, plantain, *gari*, sweet potatoes, palmnuts, groundnut, palm kernel oil, other vegetable oils and shea butter. The foods that protect the body against diseases are *kantomire*, garden egg, mango, lemon, pineapple, pawpaw, guava and watermelon. A meal produced from a selection of the right quantities of foods from the groups will provide the nutrients required for the growth of the pre-school child.

2.2 FOOD INTAKES OF PRE-SCHOOL CHILDREN

Pre-school age children are most vulnerable to the effect of malnutrition resulting from poor weaning practices and food habits. The diets of pre-school children are based on the staples found within the area in which the young children reside.

Floris and Garcia, (1959) in their study of Guatemalan pre-school children found that their diets consisted of bread, tortilla and spaghetti, all derived from cereals. Some quantity of rice was also consumed. They further discovered that children between 3-5 years were given diets as for adults and also these children were fed at irregular intervals.

The work by Brew-Graves, (1978) in Accra, showed that the predominant pattern of eating among pre-school children per day was that of 3 meals. This comprised breakfast, lunch and supper. Some of the mothers however, added snacks to the meals. van Staveren et al., (1971) also found this same trend among the Surenamese pre-school children he studied. This mode of feeding may not aid the child to obtain the nutrient requirements for this period of rapid growth. This is because most young children with a limited capacity for food are more likely to obtain all the dietary essentials if they are fed something in mid morning and mid afternoon (Robinson, 1978).

In Northern Nigeria it was found that the diet of pre-school children was based on maize, guinea corn, millet and rice (Addo, 1983). These cereals according to Addo, (1983) were consumed at least once a day in a variety of forms with

vegetables. Simic, (1971) also found that cereals form the main staple in Ghana. Corn is the predominant cereal used for the preparation of meals for pre-school children in the southern portion of Ghana. A fair amount of rice is also consumed by the children. Cereals are valuable chiefly as an economical source of energy. They are also a significant source of protein in the diet (Hughes and Bennion, 1970), providing one third of total protein of the diet in Ghana. (Simic, 1971).

A survey of the diet of 80 rural pre-school children aged 2-5 years was carried out at Jannie Madu, India. Their daily intakes of food were estimated. The results of the survey revealed that the diets of the children contained adequate protein and iron. However, Calcium and calorie intakes were low (Sundararaj, 1972).

Popkin and Solon, (1976) found that in the Cebu Sample they studied, simple cross tabular analysis showed that the Calorie, protein and iron intakes of children whose mothers work were low.

Flores and Garcia, (1959) also reported that the dietary intakes of most of the children in their study were inadequate especially in good quality protein and vitamin A. The mean intake of the children 2-3 years were near the RDA except for calcium, Vitamin A and riboflavin which were about half (50%) of the RDA. While diets of 3-5 years old children supplied 75% of the RDA for Calcium, protein and thiamin and about 50% for calorie.

2.3 ABSENCE OF MOTHER AND WELFARE OF CHILDREN

In all cultures women are providers of food as well as caretakers of children. They grow food or earn money to buy it, they prepare it and they mediate its distribution among household members (Roger and Youssef, 1986).

The primary responsibility of child-care is nowhere in the world left to men. More mothers are working in both the modern and traditional sectors. Even mothers with young children now find it necessary to venture further from home in order to provide a livelihood for the family. Thus as Leonard and Lander, (1991:2) observed: "Women with children under the age of six are employed and the trend appears to be growing. The number of women returning to the job market in the USA within one year of giving birth, for instance, rose from 31 percent in 1976 to 50.8 percent 1987. In Nairobi Kenya, 25 per cent of mothers surveyed were working by the time their children reached six months and 29 per cent were employed when the child was nine to ten months of age".

Traditionally, the Ghanaian woman has been known to work both in and out of the house, but under conditions that permitted the care of the child when it needed help within her own appointed time. She traded in and around the house or the market place or had contributed to the labour force on the family farm (Williams, 1978). Under these conditions the care of the child did not create any problem because the child goes

along with the mother.

According to Kumekpor, (1974) with the introduction of cash economy, trade and commerce, a new dimension, that is external location of women's work, was added. Women were employed then in bureaucratically organized work situations. They were required to operate within specifically defined structure and rigid time schedules. In the U.S.A. before the 19th Century the location of women's work was inside the home. However, over the course of the 19th Century the location of women's work changed from the home to external locations (Kleinberg, 1988). This trend of affairs was also observed in Kenya by de Glenville et al., (1979) who found that women in East Africa were employed in a wide variety of jobs in industry, trade, teaching and government as well as in agriculture. Women in Ghana have also experienced the change taking place elsewhere as far as location of work is concerned. Ghanaian women are now involved in a lot of economic activities both in the formal and informal sectors (Ako, 1978; Aryee, 1987). Studies carried out in Nigeria also show the same trend. Addo, (1983) and Feyisetan, (1986) found that in Nigeria, with the rapid increase in urbanization, the growth of large commercial and industrial establishments coupled with the need for additional income to supplement the husband's income, many mothers of pre-school children work away from home for long hours. These mothers sometimes are employees of establishments where children are not allowed.

This means that the mother is unable to take her child along during those hours she has to be away from home.

The job responsibilities of women now leave them with very little time to spend with their children. Jelin, (1984) in her study found that women who are employed outside the home spend only close to 33 hours a week on house work which include child care. The data from work done by Walker, (1973) revealed that the average amount of time spent on household work by employed women ranged from 4-8 hours daily and for non-employed women 5-12 hours daily.

Child care as reported by Savane, (1984) is an aspect of conflict between salaried work and motherhood and in places where there is total absence of Creches and day-care nurseries, the problem is not easily resolved.

Popkin, (1980), examined the effect of labour force participation of mothers on dietary and time input into child care as well as the resultant impact on the nutritional status of the children from 34 rural areas in Laguna, Philippines. The results suggested that the market work status of rural mothers has net negative effect on the average nutritional status of children aged between one to seventy-one months in each rural household.

Tripp, (1982) further confirms that the occupational activity of the mother is most significantly associated with the nutritional status of the child, since a mother's job seriously affects the amount of time she is able to devote to child care. Again, according to Roger and Youssef, (1986) the

mother's involvement in economic activity puts the child's well-being at risk. They stress the nutritional importance of breast feeding which can only be done by the mother and which is diminished by mothers' work.

Working mothers make various child care arrangements for the pre-school children while they work. Some of these mothers are reported by Nerlove, (1974) to transfer the responsibilities of child care to child nurses. Lavine and Lavine cited by Nerlove, (1974) stated that the responsibility of these child nurses cannot be described as casual because it includes feeding, cleaning and long hours of carrying the children.

Williams, (1978) carried out a study of 247 working mothers employed in 14 different Ministries of the Government of Ghana in Accra. She found a variety of child care arrangements made by working mothers for their children. Most mothers left their children in the care of househelps, grandmothers or family members in Accra or outside Accra and a few left the children in day care centres. Date-Bah, (1976) and Otchere, (1978) also discovered the same arrangements in their respective works. The findings of the study by Williams, (1978) further suggest that some of the children were separated physically from their mothers. On such physical separation, Shermon, (1972) has this to say:

"A factor which might influence consumption and the effect of food eaten on the body is emotional disturbance of the young child. Emotional disturbance has been seen

as generally resulting from a child's removal from its mother."

Abbi et al., (1991) also found that 30 per cent of the children of working mothers studied were looked after by siblings and as high as 57% by grand parents. From the studies of Addo, (1983) and Feyisetan, (1986) it was evident that working mothers entrust their children in the care of nannies, relatively inexperienced unskilled housemaids, whose services are sometimes unreliable or older siblings who have little knowledge of child care and nutrition. Under these circumstances pre-school children may not meet their nutritional requirements and may consequently become malnourished.

2.4 EFFECT OF MOTHER'S INVOLVEMENT IN ECONOMIC ACTIVITY ON BREASTFEEDING

Breast milk meets the child's needs as no other substance or source can (Uddoh, 1980). Breast feeding has many advantages. It is labour saving because it requires little or no preparation. The milk is of the right temperature, uniform composition, always clean and sterile. There is less risk of contamination with pathogens. It confers immunity on the child against such infectious diseases as measles and tuberculosis during the early weeks of life (Uddoh, 1980). In spite of all the advantages of breast feeding, there is a world-wide decline in its prevalence and duration (Anyanwu et al., 1985). It is clear from studies conducted in Bahrain,

Burma, Iraq, Dar-es-Salam, Libya and Ghana that there is a decline in breast feeding. (Amin et al., 1988, Bantje and Yambi, 1983; Musaiger, 1983; Oo-Tin-Tin, 1985; Darwish et al., 1982, Adjei-Donkor, 1981, Otchere, 1978). The studies also revealed that working mothers especially those in urban areas, breast fed their infants for only one to three months.

There are a lot of factors that influence the prevalence and duration of breast feeding. Taba, (1970) identified the following factors as being responsible for the continuing decline in breast feeding : modernization, urbanization, affluence, changes in family life and gainful employment of mother outside the home. In addition, Popkin and Solon, (1976) found that increased female labour force participation as well as change in location of female work are key factors in the decline of breast feeding. According to Nerlove, (1974) among the Gurrii of Kenya, women are responsible for corn and millet cultivation upon which the society primarily depends. The young children are cared for by child nurses while the mothers are working. These substitute nurses, can do little about breast-feeding. They may offer only supplementary foods. The study concluded that mothers who are involved in subsistence activity introduced their children to supplementary foods before the child is one month old. Working mothers replace some of the breast feeding by bottle feeding after a short period of 6 weeks - 3 months because they have to return to work (van Staveren et al., (1977).

Di Dominico and Acuni, (1979), observed at Ibadan that women in traditional working environment such as the market where the children can accompany mothers have a definite tendency to breast feed longer than those in modern working environment where working hours are inflexible and the child must be left at home. The trend towards longer breast feeding is even more apparent if manual workers are contrasted with white collar professional workers.

2.5 FACTORS OTHER THAN WORK THAT INFLUENCE FEEDING OF CHILDREN

Besides the mother not having the time required to feed or supervise feeding her child personally, there are other factors at play leading to the increase in malnutrition.

It is well documented that the following factors are those that affect feeding of children : ethnic background of mother, household composition and family size, educational level of mother, income, marital status, and religious sentiments. (Marshal, 1987; Ablometi, 1988; Aguilon et al., 1982; Purvis, 1985). Researchers have on record that mothers who have some education are able to bring up children with better nutritional status than do illiterate mothers. (Piwoz, and Viteri, 1981; Chandhury, 1986; Gopaldas, et al. 1988; Futrell, et al., 1971). This is an indication that educated mothers understand some of the developmental needs of children and are able to feed them better. Working mothers add substantially to the family income and they spend a higher

proportion of their income on food. This would improve nutritional status of a household. Abbi et al., (1991) reported that low family income appears to be a major detrimental factor on nutrition and health of children of working mothers. However, Futrell et al., (1971) found that women's work has a positive effect on family income and hence nutrition of the family. In the same study Futrell et al., (1971) found some but not a strong relationship between per capita income and nutritional status. The benefits accruing from an increase in income may be offset if the amount of time a mother can give to her child is inadequate or has increased expenditure for hired child care or purchase of commercial infant foods.

Increased family size as stated by Chandhury, (1986) may adversely affect the nutritional status of every member of the household including pre-school children, because it may be associated with a decrease of per capita food intake. A study by Aguillon et al., (1982), confirmed that a large family size was significantly negatively associated with good nutritional status. It should however, be noted that it is not always the family size per se that adversely affects nutritional status of the household. The composition structure of the household is the crucial factor influencing the nutrient intake of the children. Thus the fewer the adults in the household the higher the nutrient intake of pre-school children.

2.6 MODE OF WEANING CHILDREN

Weaning is the gradual removal of the child from the breast onto other foods. The weaning period is the total period when breast milk is being replaced with other foods. This period starts when a mother introduces the child to semi-solid and solid foods and it continues until the child is completely removed from the breast. The method of separation from the breast is often very relevant, particularly, as to how and when this is carried out.

A study by Darwish et al., (1982) identified 2 methods of weaning, namely gradual and abrupt weaning. In several cases breast feeding is stopped abruptly in Ghana by smearing bitter concoctions on the nipples to prevent the child from sucking or covering the nipples with plaster (Agble, 1991). In other cases mothers are physically separated from their children by sending them to grandmothers or relatives so that they can return to work. Such practices can make the child lose appetite and refuse to eat, and sometimes become sick. This leads to poor feeding and eventually malnourishment.

Gradual weaning is preferable because it allows the child to get used to foods before breast feeding is completely stopped. It also enables the child to form better feeding habits. Weaning is the most momentous time in the child's life. It is the time when he is most likely to become malnourished if he has not learned to like a mixture of foods. The weaning foods given to the child at this crucial period are very important.

Studies have shown that most weaning foods used in developing countries do not provide adequate amounts of nutrients to meet the young child's needs. Okeke and Nnanyelugo, (1990) reported that the gruels prepared for the children in Nigeria are thin and nutritionally inadequate due to high water content, low energy density and low protein content. Orraca-Tetteh, (1972), found that the protein values of weaning foods in his studies were considerably lower than the recommended values for the growth of infants. It is now increasingly being recognized that timely supplementation with weaning foods and adequate feeding during the weaning period are at least as critical as breast feeding to child health and growth. Frequent feeding is essential during this period since small children have limited capacity to consume large amounts of food at any one time. This means that the mother or other care-takers need to spend time feeding the child at intervals throughout the day (Roger and Youssef, 1988).

On the other hand a study carried out by Woolfe et al., (1977) indicated that the Ghanaian diet as eaten by non-affluent families permits a wide range of energy intake by young children. This range includes the intake of energy recommended by FAO (1985). It was therefore concluded that there is no need for Western foods such as milk products and processed fat to be added to the traditional food pattern as additional sources of energy, because the diets, are certainly able to support growth of young children.

After weaning and introduction of solid foods, the role of the mother becomes even greater. It is she who has to produce or purchase the food that the young child needs and also to choose and prepare this food. Though the total household welfare appears to have improved with the mother's involvement in economic activity, child welfare has been found to suffer. Feeding and taking care of children especially young ones are very intensive and time consuming.

2.7 GROWTH PERFORMANCE AND ITS MEASUREMENT

Anthropometric measurements like heights and weights are frequently used in the evaluation of nutritional status and growth performance of infants and children (Thimmayamma and Naida, 1974). Anthropometric indices are of increasing importance in nutrition assessment as the procedures have several advantages. The procedures are simple, safe, noninvasive and are applicable to large sample sizes. The information generated on past long-term nutritional history cannot be obtained with equal confidence using other techniques. The procedures can assist in the identification of mild to moderate malnutrition, as well as severe states of malnutrition. The methods are also precise and accurate if standardized techniques are used.

The most widely used anthropometric measurements of growth are those of height and body weight. Weight-for-height is sensitive index of current nutritional status.

For evaluation of anthropometric indices the appropriate reference data which will allow comparison of the distribution of the anthropometric indices of the study group with those of an apparently healthy population must be chosen. The reference data could be local or international if the local one is not available.

As indicated by Gibson, (1989) the World Health Organization (WHO) has recommended the use of the United States National Center for Health Statistics (NCHS) growth percentiles as an international reference. The NCHS data were selected because the sample was cross-sectional, data collection procedures were well-standardized and fully documented, raw data on individuals are available to any investigator. The population examined appear to have attained their full growth potential. Furthermore, the sample was large and representative, including 200 well-nourished individuals in each age and sex group. In contrast, in less industrialized countries like Ghana, appropriate "local" reference data are rare or nonexistent.

The use of standard deviation (SD) scores is recommended by Gibson, (1989) for evaluating anthropometric data from less industrialized countries. The method measures the deviation of the anthropometric measurement from the reference median in terms of standard deviations or z scores.

Several systems are available for classifying individuals as malnourished based on anthropometric indices. All these

systems utilize at least one anthropometric index and one or more reference limits drawn from the appropriate reference data to identify individuals at risk of malnutrition and in some cases identify the type and severity of malnutrition. The simplest, uses a single reference drawn from a percentile or SD scores of the reference data. Schemes such as the Gomez and the Wellcome classification utilize weight-for-age for the anthropometric index and reference limits corresponding to specified percentage of the Havard weight-for-age influence median. The Waterloo classification system uses two anthropometric indices, height-for-age and weight-for-height together with risk categories designed to indicate the severity as well as type of malnutrition.

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.1 SELECTION OF STUDY LOCATION

The study was conducted at Ho, the capital town of the Volta Region. The choice was determined by the fact that Ho, being the regional capital, has different categories of women involved in a variety of economic activities both in the formal and informal sectors. Again the researcher has lived in Ho and therefore it was much easier to establish rapport with the respondents.

3.2 POPULATION

The target population was all working mothers at Ho with children aged 2-5 years.

3.3. SAMPLE SELECTION AND SAMPLING PROCEDURE

A sample of 70 working mothers with children aged 2-5 years was selected for the study. The sample was drawn from women engaged in seven different economic activities common in the area of study.

A quota of 10 was assigned to each economic activity. The seven economic activities were grouped into two: the formal and informal sectors. Those that represented the formal sector included teachers, nurses and office workers. The sample was drawn from the female workers in the Ministries of Education, Health and Agriculture. The rest were primary

school and JSS teachers and nurses from the Ho Regional Hospital.

The informal sector was represented by market women, farmers, dressmakers and women traders who sell near or in their homes. The sample for the sector was drawn from various identifiable associations like the Ho Market Women's Association, National Dressmakers and Tailors Association, 31st December Women's Movement and farmers working with the Department of Women in Agricultural Development. The sample was drawn following a purposive sampling procedure. During the sampling, only mothers who fell within the criteria set by the researcher were included in the study. The respondents were selected using the snowball technique. To select respondents for each economic activity, the first respondent was identified and interviewed. After each interview the respondent helped the researcher to identify the next respondent who satisfied the set criteria. As this went on the sample size increased (i.e. the snowball increases in size) this process continued until the target number of respondents for each economic activity was exhausted. The same procedure was repeated for each economic activity until the seventy respondents for the study were obtained.

3.4 DATA COLLECTION, INSTRUMENTS AND PROCEDURE

The data was collected between April and June, 1992, using the following instruments :

- (i) Interview;
- (ii) 24 - hour - recall;
- (iii) food frequency questionnaire;
- (iv) anthropometry;

An initial visit was paid to Ho and the following ministries and associations were identified for use : Ministries of Education, Health and Agriculture, 31st December Women's Movement, National Dressmakers and Tailors Association. Letters of introduction from the Department of Home Science were distributed to the Directors, Chairpersons and Presidents in the Ministries, Departments and Association concerned. The researcher was then introduced to the officers in charge of the women's Wings of the various Ministries, departments and associations. In some cases the researcher was assisted to identify the first respondent the same day. For others it took some days after the initial contact for the officer-in-charge of the organization to help the researcher identify the first respondent.

(i) Interviews

A structured questionnaire was developed based on the objectives of the study. The objectives of the study were explained to the respondent in order to establish rapport and allay suspicion. Thereafter, a date was fixed for the interview. During the interview, background data, perception and attitudes concerning food use, child feeding practices and child care arrangements

were collected. The interview was conducted by the researcher herself in the local language for uniformity.

(ii) 24 Hour - Recall

To estimate the food intakes of the study children, the mother or mother substitute was asked to recall the foods eaten by the study children the previous 24 hours. The foods included all foods eaten during the main meals and also snacks and drinks consumed in between the meals.

Porridge, rice, soup, stew, sugar and palm oil were estimated in household measures like stew and soup ladles, tablespoons, dessertspoons, teaspoons and cups. "Banku", "Fufu" and "Akple", were estimated by asking the mothers to break off a lump of play dough equivalent. This lump was then rolled into a ball and the circumference recorded.

The Cedi value of purchased ready-to-eat foods were recorded.

(iii) Food Frequency Questionnaire

To find out how often the study children were fed on various food items, food frequency questionnaires were used to determine the frequency with which a list of commonly consumed Ghanaian foods was used and to determine the dietary diversity of the children.

(iv) Anthropometric Measurements

Heights, weights and mid-upper arm circumferences of the study children were taken, using standard procedures described by Gibson (1989).

The heights of the children were taken using a wooden stadiometer designed by the researcher and constructed locally. It was calibrated by the researcher in centimetres to the nearest 0.5 centimetre. The weights were taken with a new bathroom scale that measured to the nearest kilogram. All the children were weighed naked or with only their pants on. Apprehensive children were weighed with their mothers or mother substitutes. The weight of the child was obtained by subtracting the weight of the mother from the weight of mother and child.

The mid-upper-arm circumferences of the study children were determined with a flexible non-stretch tape made of fibre glass and calibrated in centimetres.

The ages of the children were established by the mothers recall and cross-checked with the records on growth monitoring cards of the children.

3.5 PRE-TEST

The questionnaires were pre-tested using 7 working mothers with children aged 2-5 years at Akatsi a district capital with similar characteristics like those of the population at Ho.

3.6 ANALYSIS OF THE DATA

3.6.1 Interviews

The data were edited and coded. Percentage and frequency distributions were obtained using the Statistical Package for

Social Science (SPSS) software. The relationship between various variables were obtained by cross tabulations. To guard against drawing unjustified conclusions, chi-square was used to test the significance of the relationships between selected variables. The level of statistical significance was set at $P < 0.05$ or 5%. Therefore if probability value computed is less than .05 then the relationship is considered significant.

3.6.2 Dietary Data

The data from the 24-hour recalls were analysed by first buying and weighing the various food items estimated by the mothers so as to convert all measures into weights of food. Soups and stews which were estimated by mothers in stew ladles were converted into weights using the conversion table developed by Ferguson, (1990). See Appendix 6.

The playdough lumps broken off to represent the estimates of 'Fufu' 'Akple' and 'Banku' eaten by the children were also converted into weights using a conversion table developed by Ferguson, (1990). See Appendix 7. On the basis of the estimates from the 24-hour-recalls the nutrient contributions of the food items were calculated using the Ghana Food composition tables (1975) and the composition of Foods by Paul and Southgate, (1979). The Recommended intakes (RNI) of nutrients suggested by FAO (1985) were used as the standards of reference.

The means for each nutrient for all the children and the percentage group mean of the intake were also computed. To evaluate the adequacy of the diet the Nutrient Adequacy Ratio (NAR) for protein, calcium and iron for each of the sectors were computed (Protein values were corrected for Net Protein Utilization using the 0.7 factor). Percentage distributions of the frequency of consumption of food items in the food frequency questionnaire were tabulated.

3.6.3 Anthropometric Data

Z scores of heights-for-ages and weights-for-heights based on growth reference curves of the US National Center for Health Statistics (NCHS) and Center for Disease Control (CDC) were computed using the CDC Anthropometric software package.

This method measures the deviation of height and weight measurements from the reference median in terms of standard deviations or Z scores. Z scores rather than percentiles are recommended for use in less developed countries so that individuals with indices below the extreme percentiles of the reference data can be classified accurately (Gibson, 1989).

The Waterloo classification which uses both height-for-age and weight-for-height was used to categorize the children as normal or malnourished.

For the mid-upper arm circumferences of the children, the cut off point of 14 cms (King et al., 1972) was used to categorize the study children into normal and malnourished children.

Children at or above 14 cm are classified normal and those below are classified as malnourished (King et al., 1972).

3.7 LIMITATIONS OF THE STUDY

Like all other social researches, this study does not go without limitations. The 24-hour-recall relies on the memory of the respondent therefore estimates given may not be very accurate. The foods that are not eaten often may be underestimated and those eaten often may be over-estimated. As such it is probable that the results of calculations from the 24-hour-recall data is not the actual intake of the study children for the day in question. They are only approximations.

The stadiometer was constructed by a carpenter and calibrated by the researcher. This instrument is subject to constructional and calibration errors. However, the measurements were taken by only the researcher to minimize measurement errors.

The sample was purposively selected therefore the results cannot be generalized to the entire population defined for the study. The results are only true of the sample studied.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.0 The results and discussion are presented under the following headings :

1. Description of respondents and study children.
2. Child feeding practices.
3. Care arrangements made for pre-school children while mothers work.
4. Food intakes and quality of diets of study children.
5. Growth performance of the study children.
6. Hypotheses testing.

4.1 DESCRIPTION OF RESPONDENTS AND STUDY CHILDREN

4.1.1 Age of Respondents

A total of seventy mothers or mother substitutes were interviewed. The ages of the respondents ranged between 16 and 50 years. Table 1 gives the age distribution of the respondents.

TABLE 1: DISTRIBUTION OF RESPONDENTS BY AGE (YEARS)

AGE RANGE (YEARS)	FREQUENCY	PERCENTAGE
16-20	1	1.4
21-25	12	17.1
26-30	15	21.4
31-35	22	31.5
36-40	15	21.4
41-45	4	5.7
46-50	1	1.4
Total	70	100.00

The majority (91.3%) of the respondents were aged between 21-40 years, the most active period of production and reproduction for women.

4.1.2 Marital Status and Ethnic Background

Ninety per cent of the respondents were married while 5.7% were single and the rest were either separated, divorced or widowed. About 60% of the married respondents lived with their husbands, while the rest were living on their own because they were either second wives or their husbands had migrated to work elsewhere. Ninety-seven per cent were Ewes and the rest included a Guan and a Krobo.

4.1.3 Level of Education of Respondents

Table 2 indicates the level of education of the respondents.

TABLE 2: EDUCATIONAL LEVEL OF RESPONDENTS BY OCCUPATIONAL SECTOR

OCCUPATIONAL SECTOR	EDUCATION LEVEL					TOTAL
	NONE	PRIMARY	MIDDLE/JSS	SEC/COM	VOCATIONAL TRAINING	
Formal Sector	-		4	2	24	30
Informal Sector	3	3	26	8		40
Total No.	3	3	30	10	24	70
Percentage of Sample	4.3	4.3	42.8	14.3	34.3	100

All respondents except a few (4.3%) have had formal education ranging from primary to vocational training. Mothers who have some

education have been found to bring up children with better nutritional status than illiterate mothers (Gopaldas et al., 1988: Chandbury, 1986). It is therefore expected that almost all the children involved in the study should be of sound growth performance.

4.1.4 Income

The monthly income of the mothers is presented in table 3.

TABLE 3 : DISTRIBUTION OF MONTHLY INCOME BY OCCUPATIONAL SECTOR

OCCUPATIONAL SECTOR	MONTHLY INCOME ¢						TOTAL
	1,000-10,000	11,000-20,000	21,000-30,000	31,000-40,000	41,000-50,000	CANNOT ESTIMATE	
Formal Sector	1	4	15	8	2	-	30
Informal Sector	7	9	2		4	10	40
Total No	8	13	17	8	6	10	70
Percentage of Sample	11.4	12.8	24.3	11.4	5.7	25.7	100

It is clear from Table 3 that the majority of the respondents who are employees in the formal sector earned between ¢11,000.00 and ¢40,000.00. Also the employees who earn regular salaries and wages were able to estimate their real monthly incomes or gave close estimates to what they earned. About a quarter of the respondents, mainly those in the informal sector were unable to estimate their profits or incomes probably because they do not keep proper records of their earnings. It may well be that they knew their incomes

Generally the income status of the respondents was low. Almost fifty percent earned between ₵1,000.00 - ₵30,000.00 monthly. At the time of the study the minimum wage for the Ghanaian worker was pegged at ₵420 a day or approximately ₵12,600.00 a month. Even though their daily earnings were more than the minimum wage, considering the rising cost of living and number of children some of the respondents had, it will be difficult to provide the basic needs for the family.

4.1.5 Support Provided by Fathers of Study Children

Most mothers (95.6%) reported that the fathers of the study children provided money and other items needed for the feeding of the children. Although 39.7% of the married respondents were living on their own it is encouraging to note that the responsibility of caring for the children was shared by both parents.

4.1.6 Length of Time Respondents Stayed Away From Home

Table 4 gives the distribution of the length of the time that mothers spent away from home daily.

TABLE 4: FREQUENCY DISTRIBUTION OF TIME THAT RESPONDENTS SPEND AWAY FROM HOME FOR OCCUPATIONAL PURPOSES

OCCUPATIONAL SECTOR	TIME AWAY FROM HOME (HOURS)			
	1-4	5-8	9-12	TOTAL
Formal Sector	2	22	6	30
Informal Sector	14	11	15	40
Total	16	33	21	70
Percentage of Sample	22.9	47.1	30	100

The mothers spend varying lengths of time away from home working. The majority (77%) spend between 5-12 hours (an average of 7 hours

daily away from home. Most of the respondents in the formal sector work for the usual 8 hours a day, while most of the respondents within the informal sector where the time frame is more flexible spent longer hours at work. For these mothers as long as business goes on they continue to work. This finding is consistent with previous studies which revealed that working mothers spent a substantial part of the day outside the home (Ardayfio, 1981; Kumekpor, 1974).

All the mothers had their reasons for working. These reasons are given in Table 5.

TABLE 5: DISTRIBUTION OF RESPONDENTS ACCORDING TO THEIR REASONS FOR WORKING

REASONS FOR WORKING	FREQUENCY	PERCENTAGE
- Work to help look after the children	42	60.0
- Work to supplement husband's income	17	24.3
- Work to get money for basic needs	8	11.4
- Cannot do without working	3	4.3
TOTAL	70	100

It is clear from Table 5 that most mothers (95.7%) worked mainly to earn money for maintaining their families. Other studies found similar reasons for working mothers (Kumekpor, 1974 and Williams, 1978).

4.1.7 Number of Children Per Respondent

The distribution of the number of children respondents had is presented in Table 6.

TABLE 6: DISTRIBUTION OF NUMBER OF CHILDREN OF RESPONDENTS

NUMBER OF CHILDREN	FREQUENCY	PERCENTAGE
1	16	22.9
2	21	30.0
3	11	15.7
4	15	21.4
5	5	7.1
6	1	1.4
7	1	1.4
TOTAL	70	100.0

Over two thirds (77.1%) of the mothers had 2 or more children, a situation which certainly calls for a caretaker if the mother works outside the home.

4.1.8 Description of Study Children

The study children were aged between 24 and 60 months, the mean age being 38 months.

Ninety per cent were born at a hospital while the rest, all being children of farmers, were delivered at home with the help of a traditional birth attendant. This was probably because the farmers lived on the outskirts of the town, far from the hospital. Unless a complication sets in at the time of delivery, mothers did not go to the hospital. It was also evident that the mothers regularly attended Maternal and Child Health Clinics with the study children. This information was

confirmed by the inspection of growth monitoring cards of the children which all the respondents had.

4.2 CHILD FEEDING PRACTICES

4.2.1 Breast feeding

All the respondents said they breast fed the study children. This shows the universality of breast feeding among the mothers (Gomez, M. V. 1993, Steel, A. 1989). However, the duration varied from mother to mother. The trend was similar to what was found among Papua New Guinean and Libyan career women (Marshal, 1987; Amin et. al, 1988) where breast feeding was nearly universally practised for varying periods of time.

4.2.2 Stoppage of Breast Feeding

Table 7 presents the distribution of age at which the study children were completely removed from the breast.

TABLE 7: DISTRIBUTION OF AGE AT WHICH THE STUDY CHILDREN COMPLETELY STOPPED BREASTFEEDING

AGE AT WHICH CHILDREN STOPPED BREASTFEEDING	FREQUENCY	PERCENTAGE
Below 12 months	6	8.6
12-18 months	44	62.9
19-24 months	16	22.9
25-30 months	3	4.2
No response	1	1.4
TOTAL	70	100.0

The distribution shows that the majority of the children (85.8%) were stopped between 12 and 24 months. The practice of breast feeding children for this length of time is very

healthy because by the time the child is removed from the breast he would have been ready both physically and physiologically to depend on foods other than breast milk. However, a few were taken off the breast before they reached their first birthday, a practice which Darwish et al., (1982) and van Staveran et al., (1971) also found in their studies which is not a sound practice for the proper growth of most children.

4.2.3 Reasons for Terminating Breast Feeding

Mothers gave various reasons for terminating breast feeding the study children. Table 8 presents their reasons.

TABLE 8: DISTRIBUTION OF REASONS FOR TERMINATING BREAST FEEDING OF STUDY CHILDREN

REASONS FOR TERMINATING BREAST FEEDING	FREQUENCY	PERCENTAGE
- Child was able to eat and was independent.	18	25.7
- To let or force the child to eat.	15	21.4
- Because of mothers work.	30	42.8
- Mother became pregnant.	3	4.3
- Mother fell sick.	2	2.9
- To prevent the child from becoming sick.	1	1.4
- No response.	1	1.4
TOTAL	70	100.0

Table 8 shows that 42.8 percent stopped breast feeding their children because of their work. It is clear that work is one of the powerful determinants for stopping breast feeding like what Darwish et al., (1982) found in their study. Most mothers in Ghana even those with very young children work. It is encouraging to note that probably, had it not been their need to work they might have breast fed even for longer periods. This is evident in Table 7 where the majority of mothers 85.8% stopped breast feeding between 12 and 24 months.

The results further show that 25.7% of the sample stopped breast feeding because their children were able to eat and they were also independent. Children in this category are not likely to suffer any growth faltering because they would have become used to the meals that will supply them the needed nourishment at the time breast feeding is completely terminated.

About a quarter of the mothers felt that breast feeding interfered with the child's eating of other foods so they terminated breast feeding to encourage their children to eat other foods. Children are most vulnerable to the effects of malnutrition resulting from poor weaning practices and food habits.

Again the psychological trauma associated with sudden weaning often reduces food intake. Studies have shown that breast feeding is stopped either gradually or abruptly (Agble,

1991, Darwish et al, 1982). The result of the current study revealed that 54.3% of the children were weaned gradually while 44.3% were weaned abruptly.

4.2.4 Methods Used to Stop Breast Feeding

Table 9 shows the various methods mothers in the study used to stop breast feeding their children

TABLE 9: DISTRIBUTION OF METHODS USED TO STOP BREAST FEEDING STUDY CHILDREN

METHOD	FREQUENCY	PERCENTAGE
- Reduced number of breast feeds.	24	34.3
- Smear a paste of flour, powder or 'agidi' on breast or nipple.	13	18.6
- Smear nivaquine or bitter concoction.	9	12.9
Put plaster on nipple.	13	18.6
Rebuke the child when about to suck.	2	2.8
Child stopped on his own.	7	10.0
Physical separation.	1	1.4
- No response.	1	1.4
Total	70	100.00

The study reveals the variety of methods used to wean the study children from the breast. It is evident from Table 9 that about a third of the respondents reduced the number of feeds per day until all breast feeding was replaced by other foods. This good practice needs to be encouraged because by

the time the child stops breast feeding he or she would have been gradually introduced to solid foods and would have been used to them.

An interesting result that also emerged out was the fact that 18.6% of the respondents stopped breast feeding by smearing either a paste of flour, powder or "agidi" on the breast to scare the children from sucking. The result recorded in Table 9 is in conformity with what Darwish et al., (1982) and Agble, (1991) found in their studies. But smearing of paste of flour, powder or agidi was found to be a method peculiar to this study. In all, about 54% applied force to ensure stoppage of breast feeding by children. This sudden shift from breast feeding can make the child lose appetite and refuse to eat which may lead to sickness and eventually malnourishment (Agble, 1991).

Since the stoppage of breast feeding using force is an abrupt mode of weaning, there will hardly be any time for gradual introduction of solid foods to allow the child to get used to them. This method of weaning therefore needs to be discouraged.

4.2.5 Age of Introduction of Supplementary Food

In Table 10, the ages at which the study children were introduced to supplementary food are presented.

TABLE 10: DISTRIBUTION OF AGE OF INTRODUCTION OF SUPPLEMENTARY FOOD TO STUDY CHILDREN

AGE RANGE (MONTHS)	FREQUENCY	PERCENTAGE
< 1 month	5	7.1
1 - 2 ½	13	18.6
3 4	41	58.6
5 6	7	10.0
7 8	1	1.4
9 10	1	1.4
Can't Remember	2	2.9
TOTAL	70	100.00

About two-thirds (68.6%) of the mothers reported introducing their children to supplementary foods around 3-6 months. After the age of four to six months breast-milk alone is insufficient to satisfy the nutritional requirements of the child. Other foods must therefore be added. Over a quarter (25.7%) however practised early introduction of supplementary foods by less than 3 months. Nerlove, (1974) also found this early introduction among the women he studied in Kenya. The practice of early introduction of supplementary food is not good since at such a tender age the child will not be ready physically and physiologically for foods other than breast milk.

The results revealed that corn dough porridge was the most popular first supplementary food given to almost all the children. This agrees with what Asima, (1992) and Mantey, (1993) found in their studies. In a few cases roasted corn

meal porridge or home-made weanimix porridge was used instead.

Almost all of the respondents (92.9%) introduced these porridges to the study children using cup and spoon. Since most of these mothers who use cup and spoon in feeding their children visit the Maternal and Child Health Clinics (MCH) it is probable that this healthy habit might have been cultivated during their attendance at the MCHs.

The mothers could also have taken a cue from the campaign against the use of feeding bottles by the Ghana Infant Nutrition Network. The campaign against the use of feeding bottles is motivated by the contamination resulting from improper sterilisation of bottles and poor sanitary practices.

A variety of other foods were used as weaning foods for the study children. These were based on the main staple foods, corn and yam. The following were the foods mentioned by an overwhelming majority of respondents as the weaning foods they gave to their children.

- Corn dough porridge (plain)
- Roasted cornmeal porridge (plain)
- "Mpotompoto" (yam pottage)
- Mashed yam or plantain mixed with palm oil
- "Akple" with okro or vegetable soup
- Soft cooked rice mixed with margarine.

Apart from "mpotompoto" and 'Akple' and okro soup which may contribute additional nutrients, the rest of the dishes used for weaning appear to contribute mainly calories to the diets

of the children. These growing children in addition to energy, need substantial amounts of other nutrients such as protein, calcium and iron which may not be adequate in the dishes given to them by their mothers. If any of the dishes mentioned above form one of the major meals of the day it will be unlikely to meet the children's nutritional requirements for the day.

The porridges made are sometimes thin for the young child to drink easily but they could be nutritionally inadequate due to the high water content, low energy density and low protein content (Okeke and Nnanyelugo, 1990). Due to the child's small stomach capacity he may take only a little at a time, hence eating such diet will not satisfy the nutritional requirements (Robinson, 1978).

The number of meals a child eats determines whether the child's full nutrient requirements will be met or not. The number of meals eaten daily by study children daily is shown in Table 11.

TABLE 11: NUMBER OF MEALS EATEN BY STUDY CHILDREN BY MOTHER'S OCCUPATION SECTOR

OCCUPATIONAL SECTOR	NUMBER OF MEALS EATEN DAILY			
	3	4	5	TOTAL
Formal Sector	9	18	3	30
Informal Sector	21	13	6	40
Total	30	31	9	70
Percentage of Sample	42.9	44.3	12.8	100

Table 11 indicates that over 80% of the Study Children ate 3-4 meals a day. As stated by Robinson, (1978) most young children with limited capacity for food are more likely to obtain all the dietary essentials if they are fed something in the middle of the morning and the afternoon.

The statement suggests that young children should be fed about five times a day. So it is likely that the majority of the study children fed only 3 4 meals a day are not meeting their nutrient requirements.

According to UNICEF, three daily meals on a basically cereal diet is not sufficient to cover the energy needs of children under five years old (UNICEF 1985).

4.2.6 Eating Arrangements for Study Children

The quantity of food children eat influences the amount of nourishment the children derive from their meals. It is therefore, necessary to know the person who eats or shares meals with the children especially the young ones. Table 12 presents who eats meals with study children.

TABLE 12: DISTRIBUTION OF WHO EATS WITH STUDY CHILDREN

RESPONSES	FREQUENCY	PERCENTAGE
Child eats alone.	42	60.0
- Child eats with mother.	14	20.0
- Child eats with brothers and sisters.	6	8.6
The whole family eats together.	6	8.6
Child eats with other children.	2	2.8
Total	70	100.00

Table 12 shows that 60% of the children ate their meals alone while 20% ate their meals with their mothers. It was found that those children who share the meals with their brothers and sisters or with other children were the older ones between the ages of 4 and 5 years. The younger children eating alone should be encouraged. Since these children will not be eating with older children who may eat faster than they do, it is likely that the nutrient intakes of the study group will be fairly good. Mothers must therefore allow their children especially young ones to eat alone.

The practice of mothers eating with their young ones could also be encouraged since the mother will help feed them and also will be more considerate when it comes to rate of eating to ensure sufficient food intake.

In all, 91.4% of the mothers said in their judgement their children were well fed. The rest were dissatisfied with the way the children were fed. The reasons why respondents considered their children well fed are presented in Table 13.

TABLE 13: REASON GIVEN BY RESPONDENTS AS INDICATION FOR WELL FED CHILDREN

REASONS	FREQUENCY	PERCENTAGE
- Child is growing well and does not fall sick often.	46	71.9
- Child eats well.	4	6.2
Child is growing well and is always healthy.	14	21.9
Total	64	100.00

All the mothers who said their children were well fed gave the general impression that their children were healthy and eating well. The criteria used as indicators for well fed children by the majority of respondents (93.8%) is the growth pattern of their children. When the child grows well it meant that he is well fed. This could be the result of the teachings that go on at the Maternal and Child Health clinics using the growth monitoring cards.

The few mothers who said their children were not well fed said their children refused what they were given to eat. One respondent reported the frequent ill-health of the child as an indication of poor feeding.

For these children with poor feeding habits the mothers felt their appetites will improve if they are taken to the hospital or given vitamin supplements.

4.3 CARE ARRANGEMENTS MADE FOR PRE-SCHOOL CHILDREN WHILE MOTHERS WORK

All the respondents were not able to take their children along to work places. This is particularly true of those who work in the formal sector. The distribution of the respondents who are able to take their children along to work and those unable to do so are recorded in Table 14.

TABLE 14: PERCENTAGE DISTRIBUTION OF RESPONDENTS ACCORDING TO WHETHER THEY TAKE THEIR CHILDREN TO WORK OR NOT

OCCUPATIONAL SECTOR	RESPONSE		TOTAL
	YES	NO	
Formal Sector	2	28	30
Informal Sector	30	10	40
Total	32	38	70
Percentage of Sample	45.7	54.3	100

The results reveal that a little over half (54.3 percent) of the respondents don't take their children along to work, and these are mainly those in the formal Sector. Di-Dominico and Acuni, (1979) also found from their survey that mothers who work within the traditional working environment such as at the market have their children accompany them while those whose working hours are more inflexible leave their children at home.

4.3.1. Where Children Stay in Their Mothers Absence

Table 15 shows places where the Study Children are left when their mothers go to work.

TABLE 15: DISTRIBUTION OF WHERE CHILDREN ARE LEFT BY MOTHERS WHO DO NOT TAKE THEIR CHILDREN TO WORK

WHERE CHILDREN STAY IN MOTHER'S ABSENCE	FREQUENCY	PERCENTAGE
At home	26	68.4
In a neighbour's house	4	10.5
- In a nursery school	6	15.8
- With a Caretaker	2	5.3
Total	38	100.00

The majority of the children who were not taken to work were left at home. The rest were either left in a neighbour's house, at a nursery or with a caretaker. The home is a better environment for the child. Most of these children as revealed by the results have educated mothers. They are also allowed to eat alone - factors that will enhance better feeding. Besides, the majority are kept at home therefore it is expected that they should have better attention and nourishment.

4.3.2. Persons Who Take Care of Children in Mothers' Absence

The people who take care of children of working mothers are presented in Table 16.

TABLE 16: DISTRIBUTION OF PERSONS WHO CARE FOR THE STUDY CHILDREN IN MOTHER'S ABSENCE

CARE-GIVER	FREQUENCY	PERCENTAGE
- House help.	4	10.5
- Relatives.	20	52.6
- Neighbour.	6	15.8
- Nursery School attendant.	6	15.8
Sibling.	2	5.3
Total	38	100.00

Relatives cared for half (52.6%) of the study children who stayed at home. The relatives were either the grandmothers or aunts of the children. The rest were cared for by househelps and neighbours, nursery school attendants and siblings. Date-Baah, (1976), Addo, (1983) and Williams, (1978) also found the same categories of people taking care of children of working mothers. Children who are cared for by relatives are more likely to receive better care than children left elsewhere. This is because a care-giver who is a relative of one of the parents of the child will relate to the child better than probably a stranger. Again, since in most cases the care giver will be living with the family in the same home, the child will not be saddled with having to adjust to the care giver and other children as is the case when

children are left in nursery schools. However, young siblings and househelps with little knowledge of child care may not give the best of care to the children. The nursery school attendant who is employed to attend to many children will have to divide her attention for all the children. Individual attention may not be there especially for those children who need to be coaxed. The care givers in this study were aged between 10 and 80 years. A few of them (19.5%) had no formal education. The rest had primary, middle, secondary or vocational education.

In 63.2% of the cases the caregivers were not paid anything. Since most of them were relations they were only provided with clothing and food. The remaining care givers received between ₵1,000.00 ₵3,000.00 a month for their services.

When mothers were asked to comment on how satisfactory the care arrangements they made for their children, 81.5% said they felt satisfied with the arrangements. The most popular reason given was that their children were taken good care of and they were growing well. The above assessment appears consistent with the earlier assertion by 91.4% of the respondents that their children were healthy.

The rest did not feel comfortable with the arrangements they have made. The main reason given was that the children were not fed on time. Some said their children were not kept clean and neat by the care givers. Others got scared when the

child fell sick because they thought the child would not be given the needed attention.

The fears of these working mothers are probably genuine as shown in the study by Addo, (1983) that some of the househelps were inexperienced and may not care for the children well in their mothers' absence. Considering the tender age of some of the care givers in this study, it is probable that these young siblings and househelps will be minimally competent in feeding and doing child-care related tasks. Therefore they cannot care for the children left in their care properly.

4.4 FOOD INTAKES AND DIET QUALITY OF STUDY CHILDREN

4.4.1 Dietary Diversity of the Study Children

The dietary diversity of the study children is based on the frequency of consumption of foods from the Ghana six food groups (see Appendix 1).

The results that the children were fed with a variety of items from the six food groups. Smoked fish was the main animal product consumed daily together with cereals and legumes served with vegetable soups or stews. The foods with high frequency of consumption were those available in the study area. It is encouraging to note that the consumption of soft drinks and ice lollies was low since these food items contain very little nutrients.

4.4.2 Animal Products

Among the animal products, smoked fish was fed daily to almost all the study children (91.5%) probably because it is cheaper than meat and also it is available throughout the year. Fresh meat, bush meat and poultry are expensive, therefore they were only eaten occasionally. Snails which are seasonal are consumed less frequently by the study children. Some of the study children (47.1%) were never given snails, may be because they are not available.

4.4.3 Cereals

Among the cereals, corn was the most frequently eaten daily by 87.1% of the children. This finding is similar to the work done by Simic, (1971) which revealed corn was the main staple cereal of Ghana. The dishes made from the corn are usually from the whole grain. Therefore the nutrients in the grain are consumed more or less intact by the children. Rice is eaten by most of the children (80%), a few times a week. Cereal products like bread and biscuits were very popular. Bread which now features very much in the Ghanaian diet was consumed daily by 72.9% of the children while biscuits were eaten by 74.4% a few times a week. Millet and sorghum were not frequently eaten because they are not cultivated in the study location.

Although the Ministry of Health had advocated the use of weanimix for children throughout the country, the consumption

of weanimix by the sample studied was very low. Only 1.4% of the children ate weanimix daily while 65.7% of the sample was never given weanimix. The low rate of consumption may be accounted for by the cultural belief that children should not be given beans since it causes bloated stomachs. Again, groundnuts are also considered as food not good for children.

4.4.4 Legumes and Oil Seeds

Items in the legumes and oil seeds group were given to the children quite often. It is encouraging to note that the beliefs mentioned earlier did not influence the mothers' decision to feed their children with legumes. Two thirds or more of the study children were given beans and groundnuts a few times a week. Soya beans were never eaten by 85.8% of the children because they are not available. This occurrence is unfortunate because soya beans unlike other proteins from vegetable sources is a protein of high biological value. Therefore soya beans would probably have been a cheaper source of protein for growing children. Palmnuts were frequently used by the respondents for their children. At the time of the study palm nuts were in season so the majority of the children were fed with palmtree soup.

4.4.5 Fats and Oils

The most frequently consumed item among the fats and oils group was palm oil. As high as 86.5% of the study children

were fed with it daily. This is encouraging because palm oil is a rich source of pro-vitamin A. This trend might be the result of the nutrition education going on at the maternal and child health clinics. Refined vegetable oil and margarine are consumed by 58.6% and 42.8% respectively a few times a week whilst coconut and kernel oils were consumed less frequently. Butter and shea butter were never consumed by over 90% of the children. The type of shea butter available in the area of study is used as body cream and not for cooking.

4.4.6 Starchy Roots & Plantain

Cassava was eaten by 62.9% of the study children daily. The rest of the items in this group were however, consumed by over 80% of the study children a few times a week. The higher frequency of consumption of cassava might be due to the fact that it is cheaper than all the other items in the group. It is also due to the fact that it forms part of the staple dish.

4.4.7 Fruits

Fruits such as oranges, pineapples and bananas which are available even when they are not in season were eaten a few times a week by 90%, 85% and 72.9% respectively. Pawpaw and grape fruit were eaten by over half of the study children when they are in season. It was clear that mangoes for example were eaten when in season by over 80% of the children. Watermelon was not consumed by many of the children because it was not available in the area.

4.4.8 Vegetables

Vegetables like tomatoes, onions, pepper and garden eggs, the usual soup and stew ingredients, were eaten daily by all the children. The findings of Simic, (1971) were contrary to the findings of the present study. In his study, tomatoes, garden eggs, pepper and onions were eaten when available.

Various green leaves were eaten daily by 78.6% of the children. Cabbage and carrot being exotic vegetables are not available in the area so only a few mothers occasionally fed their children with such.

4.4.9 Beverages

The most popular beverage given to the children was Milo. Sixty-six per cent of the children were given this beverage daily. Tea was however, given to 34.3% of the children a few times a week. Coffee was not popular at all. As many as 75.7% of the children have never tasted coffee. Soft drinks like fanta and coca cola, ice cream and ice lollies were given to the children only occasionally. Most of the children were never given yoghurt.

It became clear that vitamin supplements were given to the children on doctor's advice whenever they fell sick but at the time of the study none of the study children was taking Vitamin supplements.

4.4.10 Nature of Food Intakes

The diets of the study children as obtained by the 24-hour recall method included cereals, roots and tuber dishes

served with a variety of soups and stews. Maize, rice, cassava, yam and water yam were consumed in a variety of forms at least once a day. From estimates of food intakes made from the 24-hour-recall the mean protein intake was 32.8g which was higher than the Recommended Nutrients Intake (RNI) suggested by FAO (1986), but a substantial proportion of the protein was provided by legumes and cereals. This is similar to the findings of Simic, (1971) which showed that a third of protein in the Ghanaian diet was derived from cereals. The results of this study have shown that a lot more of legumes were consumed by the study children than was found by Simic, (1971). (See Appendix 1).

Although ninety-one percent (91%) of the children consumed smoked fish daily it was observed that the portions consumed were very small. However, the consumption of other protein foods eggs, poultry and meat was low. Fruits like mangoes, pineapples pawpaw and bananas were eaten as snack. Mangoes were in season at the time of the study hence there was a high consumption of mangoes.

4.4.11 Estimates of Diet Quality

The mean daily energy and selected nutrient intakes of all the study children and the RNI are shown in Table 17.

TABLE 17: MEAN ENERGY AND NUTRIENT INTAKES OF STUDY CHILDREN BY AGE OF CHILDREN

AGE RANGE	MEAN INTAKES & RNI#			
	ENERGY (Kcal)	PROTEIN (g) *	CALCIUM (mg)	IRON (mg)
	1105±370	32.8±12	1000±550	12.4±5
2-3 Years	1360	16	400	10
4-5 Years	1830	20	500	10

* Corrected for NPU of protein

Source; FAO (1986)

Protein, calcium and Iron are important components of body tissues. Their presence or absence in the diet of the growing child will affect the growth performance of the child.

From the values recorded above it is evident that the children's meals contained on the average amounts that exceeded the RNI's for protein, calcium and iron. The average energy intake was however, less than the RNI with the children 2-3 years old meeting 81.2% of the RNI while those 4-5 years old met only 60.4% of the RNI. Over half (57.1%) of the children had energy intakes lower than the group mean.

The low energy intakes give cause for concern especially during this pre-school period when energy is needed for increased activity levels of the child and for rapid growth. With the low energy intake, protein will be used first to make for the deficit in the energy needed by the body. Therefore,

the protein will not be available for building of the body tissues. Growth faltering could occur as a result of the low energy intakes.

TABLE 18: ENERGY AND NUTRIENT INTAKES OF THE STUDY CHILDREN BY OCCUPATIONAL SECTORS

OCCUPATIONAL SECTOR	ENERGY Kcal	% RNI	PROTEIN * (g)	% RNI	CALCIUM (mg)	% RNI	IRON (mg)	%RNI
Formal Sector	1060±370	66	29.9±12	166	833±550	185	12.2±5	122
Informal Sector	1039±370	65	35.1±12	195	1128±550	2815	13.2±5	132

* Corrected for Net Protein Utilization

The mean energy and nutrient intakes recorded in Table 18 indicate that the study children in both sectors satisfied over and above the RNI for the nutrients looked at with those in the informal sector consuming higher intakes. With regards to energy, the intakes for children in both groups were low. The results confirm the findings of Popkin and Solon, (1976) that children of working mothers had low energy intakes.

The study further shows that most of the study children (94.3%) had energy intakes below the recommended daily allowances for energy. This fact is important because Church, (1981) found that malnutrition in developing countries was the result of insufficient calories.

Simic, 1971 in his study compared the calorie intakes of Ghanaian children with their counterparts from East Africa and

round that Ghanaian children had lower calorie intakes. So the situation seems not to have changed 20 years later. There is the need for efforts to be made to solve the problem especially if the study children exhibit growth faltering. If this trend of low calorie intake continues, the majority of children may become malnourished if not already so.

The mean energy and nutrient intakes by sex of the study children is presented in Table 19.

TABLE 19: MEAN ENERGY AND NUTRIENT INTAKE BY SEX OF STUDY CHILDREN.

SEX OF CHILDREN	MEAN ENERGY AND NUTRIENT INTAKE AND RNI							
	ENERGY (kcal)	& RNI	PROTEIN (g)	% RNI	CALCIUM (mg)	% RNI	IRON (mg)	% RNI
Male	1059±370	72.2	33±12	271	1030±550	246	13.3±5	122
Female	1032±370	67.9	33±12	261	990±550	236	12.4±5	124

* corrected for NPU

The male children had slightly higher intake than the female children.

To further evaluate the adequacy of the diet of the study children, the group mean adequacy ratio (MAR) which is an index of the overall quality of the diet for each of the nutrients was computed. (See Appendix 5 for how the MAR was calculated). Table 20 presents the distribution of the MAR.

TABLE 20: DISTRIBUTION OF MEAN ADEQUACY RATIO (MAR) BY MOTHER'S OCCUPATIONAL SECTOR

MOTHER'S OCCUPATIONAL SECTOR	MEAN ADEQUACY RATIO		
	PROTEIN	CALCIUM	IRON
Formal Sector	1	.91	.89
Informal Sector	1	.96	.95

The mean adequacy ratio values show that the diets of the study children were adequate with respect to protein, calcium and iron for both sectors. (Cut-off-point for MAR = 1). This is not surprising because it was reported earlier on that the diets of the children were based on cereals and legumes which provided a large proportion of the protein calcium and iron.

Although the proteins from legumes and cereals are of low biological value when eaten singly, a cereal-legume combination which the children ate would improve the nutritive value of the meals. In addition, 91.5% the children also consumed smoked fish daily (Appendix 1) which would enhance meeting their requirements and increase the quality of protein.

The mean intakes of calcium and iron were also very high as shown in Table 17. Apart from the cereals and legumes, the children consumed a fair amount of leafy green vegetables. Cereals and leafy green vegetables are rich sources of calcium and iron. However, some of the leafy green vegetables contain oxalic acid which form oxalates and render most of the calcium unabsorbable. Whole grain cereals and legumes also contain phytic acid which also interferes with calcium absorption (Bingham, 1977). The insoluble salts of calcium and iron are made soluble in the presence of acids from fruits eaten and those secreted by the digestive system. Hence the copious amount of hydrochloric acid secreted by the young children's digestive system and the acids from the fruits eaten by the children will aid the absorption of both calcium and iron. Using the values of the nutrient intakes and MAR, the diets eaten by the study children were found to be of high quality.

Growth performance of the study children was evaluated using height for age and weight-for-height indices.

The distribution of the Z scores of Height-for-Age and Weight-for-height of the study children are given in Table 21 and 22.

4.5.1 Height for Age Index

TABLE 21: DISTRIBUTION OF HEIGHT FOR AGE Z SCORES AND CLASSIFICATION OF THE STUDY CHILDREN

Z SCORES	*CLASS	FREQUENCY	PERCENTAGE
Above 2SD	Normal	64	91.4
Below - 2SD	Stunted	6	8.6
Total		70	100

* The Waterloo Classification (Adopted from Gibson 1989)

The distribution in Table 22 shows clearly that the majority of the children (91.4%) by their height-for-age index were not stunted. This indicates that the majority of the children had no previous prolonged malnutrition. It could therefore be said that the children were well fed and as a result their linear growth followed the normal pattern of increase. The normal growth performance revealed by this index (height-for-age) probably is a reflection of the adequate feeding as supported by the good diet quality and dietary diversity. It is interesting to note that 91.4% of the mothers felt that their children were well fed and healthy. This tends to support their ascertainment.

The few (8.6%) children who were stunted may be due to past chronic malnutrition. According to Keller et al., (1976),

it has been shown that the heights of African pre-school children was related to the socio-economic conditions of their families as well as their intake of energy, protein and other nutrients. The small percentage of children who were stunted as a result of chronic malnutrition might also be the few whose fathers did not provide money and other items needed for feeding them.

The results of the current study reveals that the mean protein intake of all the study children far exceeded the RNI. Thus the deficit in the heights of few children who were stunted may not be due to protein deficiency but to the low calorie intake.

4.5.2 Weight-for-height Index

Weight-for-height is a sensitive index of current nutritional status. It is also independent of age. This is an indicator that measures the thinness or fullness of the body. Table 22 presents the distribution of the Z scores of weight-for-height index.

TABLE 22: DISTRIBUTION OF WEIGHT-FOR-HEIGHT Z SCORES AND CLASSIFICATION OF THE STUDY CHILDREN

Z SCORES	*CLASS	FREQUENCY	PERCENTAGE
Above - 2SD	Normal	51	72.9
Below - 2SD	Wasted	19	27.1
Total		70	100

* Waterloo Classification Adopted from Gibson, (1989).

It is clear from the distribution that about three quarters of the study children were normal as far as weight-for-height index was concerned. Thus it could be said that most of the study children were on adequate diets at the time of the study. The rest could be described as thin for their heights. In spite of the high protein, calcium and iron intakes, the growth performance evaluation of the children show that about a quarter of the children were thin for their heights. It could therefore be said that the children were not malnourished because of their low intakes of protein, calcium or iron but because of their low calorie intakes. The findings confirmed the report of Church (1981), that malnutrition in the developing countries was the result of insufficient calories.

4.5.2 The Malnourished Group of Study Children

Table 23 examines those children who fell below -2SD of the weight-for-height index to see which age group and sex group were most affected.

TABLE 23: DISTRIBUTION OF STUDY CHILDREN BELOW - 2 SD BY AGE AND SEX WEIGHT-FOR-HEIGHT

AGE RANGE IN MONTHS	MALE		FEMALE		TOTAL	
	N	% OF SAMPLE	N	% OF SAMPLE	N	% OF SAMPLE
24-36	4	5.7	7	10.0	11	15.7
37-48	2	2.85	2	2.85	4	5.7
49-60	2	2.85	2	2.85	4	5.7
TOTAL	8	11.4	11	15.7	19	27.1

It is evident for Table 23 that slightly more females than males had low weights-for-heights. These differences in

weight between males and females might be due to the higher energy intakes by the males (see Table 19). The highest incidence of malnutrition occurred between 21 and 36 months, the post weaning period. The abrupt manner in which the children are stopped from breastfeeding and introduced to adult food tends to make the children not able to cope with it. Some may refuse to eat with the resultant effect of malnourishment and sickness. In this circumstance reduction in weight can be anticipated.

There is a further indication that wasting reduced as the children advanced in age.

The distribution of the malnourished children by their mother's sector of occupation is examined in Table 24.

TABLE 24: DISTRIBUTION OF STUDY CHILDREN BELOW -2 SD WEIGHT-FOR-HEIGHT BY MOTHER'S OCCUPATIONAL SECTOR

OCCUPATIONAL SECTOR	FREQUENCY	% OF SAMPLE
Formal Sector	6	8.5
Informal Sector	13	18.6
TOTAL	19	27.1

The results show that the majority of wasted children were those of mother's who worked in the informal sector.

It was observed from Table 14 that 75% of the mothers in the informal sector took their children along to work. The fact that children taken along to work by mothers were wasted is an indication that something was wrong with their feeding. This might be due to the fact that mothers usually purchased

food from food vendors for the children. The quality of such food seem to be questionable. These food vendors do not prepare special meals for pre-school children. It is therefore possible that the children were given meals that do not support active growth. Again it could be that the mothers do not allocate enough time for feeding or supervising feeding their children.

Infact observations during the study point to the fact that the self-employed mothers who took their children to work got so busy attending to their customers that they sometimes left the children to themselves. These children carried their meals around the work place. The very young ones whose hand-to-mouth co-ordination was not well developed dropped a lot of the food on the ground and sometimes picked up the food from the dirty ground and ate. This could lead to reduction in the quality of food consumed and to which infections and ill-health in turn might have contributed to the poor growth performance.

Mothers for example bought boiled rice and stew or rice and beans for their children. The stew for such dishes were highly spiced with pepper since it was meant for a wide range of people, mostly adults. The children were not able to eat much since they would have filled their small stomachs with water they drunk in between mouth-fulls of food to reduce the effect of the pepper. Usually, no meat or fish was bought for the children. It was also observed that most often the rice

and beans was nothing more than coloured rice and a few grains of beans. It was thus possible that the protein in the rice could not be effectively supplemented by the protein obtained from the small amount of beans. As a result the children got mostly carbohydrates and negligible amount of protein of low biological value from the beans (the rice to beans proportion was found to be 7 : 1).

Another fact that might have contributed to the poor growth performance exhibited by the children of mothers in the informal sector is the mode of weaning. Table 9 showed that about 73% of mothers in the informal sector weaned their children abruptly. This might result in the children's formation of poor eating habits including lack of appetite which could inhibit proper feeding and hence the poor growth performance. Added to this is the fact that about half of the mothers in the informal sector fed their children only 3 meals daily (Table 12). As Robinson, (1978), pointed out most young children have limited capacity for food and are more likely to obtain all the dietary essentials if they are fed something in the middle of the morning and the afternoon. It is however surprising that more children of mothers in the informal sector were wasted.

For, it has earlier on been shown that protein, calcium and iron intakes of the children whose mothers worked in the informal sector recorded higher intakes than those in the formal sector. One could then attribute this growth faltering of these children to the fact that most of the food bought for

them were not consumed but spilled as observed during the course of the study.

4.6. TESTING OF HYPOTHESES

4.6.1 Hypothesis 1

Hypothesis I was based on the relationship between occupational sector of mothers and the mode of weaning they adopted.

Ho: There is no statistically significant relationship between occupational sector of mothers and the mode of weaning they adopted.

Responses on the primary occupation of mother and how breast feeding was stopped were used to test this hypothesis.

The distribution of the responses is shown on the contingency table below.

TABLE 25: DISTRIBUTION OF MODE OF WEANING AND MOTHER'S OCCUPATIONAL SECTOR

OCCUPATIONAL SECTOR	MODE OF WEANING		
	GRADUALLY	ABRUPTLY	TOTAL
Formal	21 (13.5)	9 (16.5)	30
Informal	10 (17.5)	9 (16.5)	39
Total	31	38	69*

$$X^2 \text{ Cal} = 13.50 \quad \text{Df} = 1 \quad \alpha = 0.05$$

(*The total sample was 70 but at the time of the study a mother was still weaning and therefore not involved in this part of the study).

To test the relationship between occupational sector and mode of weaning of the children, the chi-square test of

independence (X^2) was applied. The calculated chi-square value (X^2_{Cal}) was 13.5 and the critical value (X^2_{Crit}) with 1 degree of freedom at .05 alpha level was 3.84. Since the calculated value exceeds the critical value ($13.50 > 3.84$) we reject the null hypotheses (H_0) in favour of the alternative hypothesis (H_1). That is there is a statistically significant relationship between occupational sector of mothers and the mode of weaning adopted by mothers. Most mothers in the formal sector gradually weaned their children and their counterparts in the informal sector did it abruptly.

Mothers in the formal sector worked within organised time frames so they were able to plan their weaning strategies gradually. From Table 4, it is clear that most of the mothers who worked in the informal sector stayed longer away from home. This might be because they worked within a lot of uncertainties especially those who buy and sell. If they travel to buy their wares they could be delayed unduly because of unforeseen circumstances like unavailability of transport. This situation could prevent them from coming back home and could even last for days. Therefore, the mother could say if the child survived without her for a day or two she might as well stop the breast feeding there and then. Weaning therefore would become a spontaneous decision and not planned and carried out systematically.

Table 2 also revealed that the majority of respondents in the formal sector had higher education than those in the

informal sector. The respondents in the formal sector might have knowledge of the adverse effects of abrupt weaning and as a result avoided the practice.

4.6.2. Hypothesis 2

Hypothesis 2 was based on the relationship between Educational level and Growth Performance.

Ho - There is no statistically significant relationship between Educational levels of mothers and the growth performance of their children.

Responses on Educational levels attained by mothers and the Waterloo classification of Growth Performance were used to test this hypothesis.

The distribution of responses is shown in Table 26.

TABLE 26: EDUCATIONAL LEVEL BY GROWTH PERFORMANCE

GROWTH PERFORMANCE	EDUCATIONAL LEVEL OF RESPONDENTS					
	NONE	PRIM	JSS/MID	SEC/COM	VOC/TRG	TOTAL
Normal	2 (2.2)	2 (2.2)	25 (26.2)	11 (10.2)	11 (10.2)	51
Wasting	1 (.08)	1 (.8)	11 (9.8)	3 (3.8)	3 (3.8)	19
TOTAL	3	3	36	14	14	70

$$X^2 \text{ Cal} = 0.80 \quad \text{D.F.} = 4 \quad \alpha = 0.05$$

Most of the respondents 51% were JSS/Middle School leavers and 73% of the children had normal growth performance. When the chi-square test of independence (X^2) was used to test the relationship between the level of education of mothers and

the growth performance of their children, the calculated chi-square (X^2_{Cal}) yielded a value of 0.8 and the critical value of the chi-square (X^2_{Crit}) with 4 degrees of freedom at 0.05 alpha level was 9.49. Since the calculated value was less than the critical value ($0.80 < 9.49$), the Null hypothesis of Zero relationship was not rejected. It is therefore concluded that the educational level of mothers had no significant influence on the growth performance of their children.

Education is a necessary but not sufficient condition for proper feeding and care of children. The care and feeding of children goes beyond formal education. Most educated people may know what is good for their children but prevailing conditions may not allow them to do the right thing. One may obtain the highest degree in education yet will not know much about child care and maintenance.

4.6.3. Hypothesis 3

Hypothesis 3: Was based on the relationship between Marital Status of Respondents and the Growth Performance of their children.

Ho: There is no statistically significant relationship between the marital status of mothers and the Growth Performance of their children.

To test this hypothesis responses from the marital status of mothers and the Waterloo classification of Growth Performance (See Appendix 3) were used.

The distribution is reported on Table 27.

TABLE 27: MARITAL STATUS OF RESPONDENTS AND GROWTH PERFORMANCE OF STUDY CHILDREN (WEIGHT-FOR-HEIGHT)

GROWTH PERFORMANCE	MARITAL STATUS OF RESPONDENTS					TOTAL
	SINGLE	MARRIED	DIVORCED	SEPARATED	WIDOWED	
Normal	2 (2.9)	45 (45.9)	1 (.7)	1 (.7)	1 (.7)	51
Wasting	1 (1.1)	18 (17.1)	0 (.3)	0 (.3)	0 (.3)	19
TOTAL	4	63	1	1	1	70

$$X^2 = 1.25 \quad df = 4 \quad \alpha = 0.05$$

Out of the 70 mothers 63 (90%) were married mothers and 8% were single mothers. Finding out whether the marital status of mothers had any bearing on the Growth Performance of their children, the chi-square test of independence was again used. The calculated value was 1.25 and the critical value (X^2_{crit}) with 4 degrees of freedom at 0.05 alpha level was 9.49. Since the calculated value of the chi-square was smaller than the critical value ($1.25 < 9.49$) we failed to reject the null hypothesis (H_0). It is therefore conclusive that there is no statistically significant relationship between those two variables and any trace of association is just a change factor.

Men usually played little or no role in child feeding and care so whether a woman marries or not may not have any bearing on the way she cares for her child. Even though a married woman may seem to have benefit of financial support from the husband thereby giving better care and attention to

her child this may be offset by the divided attention the woman gives to husband and child.

4.6.4. Hypothesis 4

Hypothesis 4: was based on the relationship between time spent away from home by mothers for occupational purposes and Growth Performance of children.

Ho: There is no Statistically significant relationship between time spent away from home by mothers and the Growth Performance of their children.

To test this hypothesis the responses to working hours of mothers and the Waterloo classification of Growth Performance were used. This is shown in Table 28.

TABLE 28: TIME RESPONDENTS SPENT AWAY FROM HOME FOR OCCUPATIONAL PURPOSES AND GROWTH PERFORMANCE OF THE STUDY CHILDREN

GROWTH PERFORMANCE	TIME AWAY FROM HOME (HOURS)			Total
	1-4	5-8	9-12	
Normal	12 (11.7)	28 (23.3)	11 (16)	51
Wasted	4 (4.3)	4 (8.7)	11 (6)	19
Total	16	32	22	70

$$X^2 = 9.31 \quad df = 2 \quad \alpha = 0.05$$

Among the 70 mothers, 51 (73%) had children with normal growth performance while 19 (27%) had poor growth performance. The chi-square test of independence was used to find the

association which exists between these two variables.

The calculated chi-square value (X^2_{Cal}) was 9.3 and the critical value of the chi-square with 2 degrees of freedom at 0.5 alpha level was 5.99. The magnitude of the calculated value over the critical value ($9.31 > 5.99$) leads to the rejection of the null hypothesis in favour of the alternative Hypothesis which states that there is a statistically significant relationship between the time spent away from home by mothers and the growth performance of their children. We see that 58% of the children who were wasted had mothers staying between 9-12 hours away from home daily while only 22% of the children with normal growth performance had their mothers spending 9-12 hours.

Time is a crucial factor in child care and feeding. The time input especially of low income households is important in the etiology of malnutrition. As stated by Popkin and Solon (1976), feeding and taking care of children are time intensive. It is therefore important for mothers to have time to be able to take care of their children well. Mothers who spend virtually the whole day at their work places will not have time to prepare the meals of their children, feed or supervise their feeding. The income levels of the respondents in the study were low and would not permit them to hire trained care givers who might be a suitable substitute. Since the pre-school years is a period of vulnerability children who are not fed well would have growth faltering. It is therefore

not surprising when 58% of the children with poor growth performance were from mothers who spent 9-12 hours away from home for occupational purposes.

CHAPTER FIVE

5.1 SUMMARY AND CONCLUSIONS

The aim of this study was to find out the feeding practices and care arrangements that working mothers made for their pre-school children, and to determine the relationship between the time the mothers spent away from home and the growth performance of their children.

Seventy working mothers with pre-school children aged 2-5 years participated in the study. The data was collected using questionnaires, 24-hour-recalls, food frequency questionnaire and anthropometry.

The results showed that most mothers were aged between 21 and 40 years. The majority were married. The mothers spent long hours away from home for occupational purposes (an average of 7 hours daily).

All the study children were breast fed earlier in their lives. For the majority of the children, breast feeding was terminated between the ages of 12-30 months. The children were either weaned gradually or abruptly. The findings showed that mother's work was the most powerful determinant for terminating breast feeding. Furthermore, it was found that majority of the children were mostly introduced to supplementary foods between the ages of 3-6 months. However, a quarter of the mothers, practised early introduction of supplementary foods. The weaning foods given were based on the

staples corn and yam. In most cases the children received typically adult diets as soon as breast feeding was terminated.

In some cases modifications were made to make the food softer or lighter for the children. It also became evident that these young children were fed 3-5 times a day. All the children consumed the three main meals of the day. For those children who had more than three meals a day the extra meals were snacks. The meals were eaten by most of the children alone and others shared their meals with brothers, sisters or their mothers.

The diets of the children at the time of the study comprised mainly corn, yam, cassava and wateryam. The children also consumed a fair amount of vegetables and fruits. The consumption of most animal products on the other hand was low. However, a large proportion of the children ate some amount of smoked fish daily. The results of the frequency of consumption of various foods confirmed the 24-hour-recalls made by the mothers. It became clear that the food items that mothers reported they never gave to their children did not feature at all in the meals recalled by the mothers. Thus it could be said that the recalls and results of frequency of consumption portrayed the usual food intakes of the children. Besides, no foods other than those available in the area of study were given to the children.

The nutrient intakes of the children was assessed from the 24-hour-recalls. To do this it was assumed that the meals

recalled constituted approximately 100% of the day's food intake. The assessment of the meals recalled revealed that on the average, the intakes of all the children their exceeded requirement for protein, calcium and iron but satisfied only 69 percent of their energy requirement. As a matter of fact the notion that Ghanaian children are fed on foods which provided a lot of calories was not confirmed by this study.

As a result of the care arrangements mothers made for their pre-school children, two groups of mothers emerged. One group took their children along to work, while the other left them mostly at home. These children were as a result fed and cared for by househelps, mother's relations, siblings and neighbours.

The evaluation of the growth performance of the study children using the that height-for-age index indicated that 8.6% of the children were stunted. Weight-for-height index showed that 27.1% were wasted and these were mostly children of mothers in the informal sector.

The results also revealed that mothers in the formal sector wean their children gradually while those in the informal sector did so abruptly. The analysis of the relationship between educational level, marital status of the mothers and the growth performance of the children showed that these variables had no influence on the growth performance of their children. It was however, found out that the time mothers spent away from home had some influence on the growth

performance of their children. Mothers who stayed 9 - 12 hours away from home daily had more children with poor growth performance and most of these mothers worked in the informal sector.

CONCLUSION:

The results show that the pre-school children studied were fed mainly 3 - 4 times a day by their mothers and care givers a practise which is not sound for the growth of the children. The diets of the children were based on the local staple yam and corn; and the main source of protein of high biological value was fish. The children also ate some legumes and groundnuts. The diets were found to be adequate in respect of protein, calcium and iron but low in calories. Most of the mothers in the formal sector left their children at home in the care of relatives or neighbours an arrangement which seemed better than those who left them at the day care centers, nursery schools or taken along to work.

Some of the children showed signs of malnutrition. The poor growth performance of these children was found to be a result of low calorie intakes arising from lack of supervision of feeding the children especially those whose mothers worked in the informal sector. Mother's educational level and marital status were found to have no significant influence on the growth performance of their pre-school children.

The results, however, indicated that the time mothers spent away from home for occupational purposes has a negative effect on the growth performance of their pre-school children. Most of the children who showed signs of malnutrition, belonged to those mothers who spent more than nine hours away from home.

CHAPTER SIX**5 RECOMMENDATIONS**

The following recommendations are made based on the results of this study which may be useful to the various organizations and departments involved in child welfare and health.

1. As a result of insufficient time and finance only 24-hour-recall was used to estimate the nutrient intakes of the children. In the future it might be useful to use other methods of dietary assessment like the weighed food record in addition to the 24-hour-recall to evaluate the nutrient content of the foods consumed to see whether the nutrient intakes will change.
2. There is evidence from the study that some of the study children ate only 3 meals a day. In addition, it was clear that the children ate meals that were low in calories. It is therefore recommended that nutrition education be intensified to make mothers aware of the nutritional requirements of their children. To reach all mothers, Maternal and Child Health Clinics, organization and associations that women belong to as well as the mass media should be used as channels in the nutrition education programmes.
3. In order to boost the nutrient intakes of the children it is advocated that at least two snacks be given in addition to the 3 main meals fed to pre-school children.

4. Observations show that most of the mothers who carried their children to work left them on their own hence, feeding was not properly supervised. It is recommended that Day Care Centres manned by qualified staff be established at or near work places to provide adequate supervision of their feeding among other care needs of the children. These centres should be run in such a way that the children and mothers close at the same time. Also, facilities in the existing Day Care Centres must be improved by reducing the attendant/child ratio to enable the pre-school child get individual attention.
5. A major conclusion from this study is that mothers who stayed away from home for long periods (9 or more hours) a day have more children who are malnourished. It is recommended that such mothers if possible leave their children at home because with proper supervision their children will be better fed and cared for.

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APPENDIX I

PERCENTAGE FREQUENCY OF CONSUMPTION OF FOODS FROM THE VARIOUS FOOD GROUPS

	Daily	A few time a week	Weekly	Forth- ingly	Monthly	Seaso- nally	Occa- siona- lly	Never
<u>Animal Products</u>								
Fresh Meat	7.1	28.6	20.0	1.4	1.4	1.4	37.1	2.8
Bush Meat	1.4	4.3	2.9	0	0	7.1	60	24.3
Poultry	2.9	0	7.1	5.7	10.0	4.3	40	20.0
Smoked Fish	91.5	4.3	1.4	0	0	0	2.9	0
Fried Fish	2.9	37.1	31.4	1.4	0	0	27.1	0
Fresh Fish	2.9	21.4	8.6	5.7	0	22.9	32.9	0
Dried Fish	41.4	48.6	2.9	0	1.4	0	5.7	0
Tin Fish	2.9	24.3	2.9	0	2.9	1.4	50.0	15.7
Egg	10	47.1	10.0	10	0	1.4	21.4	0
Milk	15.7	31.4	2.9	2.9	1.4	1.4	41.4	2.9
Snail	2.9	14.3	1.4	0	0	32.9	1.4	47.1
<u>Cereal & Cereal Products</u>								
Corn	87.1	10.0	0	0	0	1.4	1.4	0
Rice	14.3	80.0	5.7	0	0	0	0	0
Millet	2.9	5.7	1.4	0	0	2.9	10.0	77.2
Sorghum	2.9	2.9	1.4	0	0	2.9	14.3	75.7
Bread	72.9	14.3	4.3	0	0	0	4.3	4.3
Biscuit	11.4	74.3	7.1	0	0	0	4.3	2.9
Wheat-Soy-Blend	1.4	10.0	0	0	0	0	4.3	84.3
Wheat	0	1.4	0	0	0	0	22.9	75.7
Weanimix	1.4	0	0	0	0	0	17.1	65.7

APPENDIX I CONTD.

	Daily	A few time a week	Weekly	Forth- ingly	Monthly	Seaso- nally	Occa- siona- lly	Never
<u>Legumes and Oil Seeds</u>								
Beans	27.1	65.7	1.4	0	0	0	1.4	4.3
Groundnut	10	82.9	4.3	0	0	0	0	2.8
Agushie	1.4	47.1	0	0	0	1.4	42.9	7.1
Soyabeans	1.4	5.7	1.4	0	0	0	0	85.8
Palmnuts	40.0	57.6	2.4	0	0	0	0	0
<u>Fats and Oils</u>								
Refined Oil	7.1	58.6	1.4	0	0	1.4	30.0	1.4
Coconut Oil	4.3	20.0	0	0	0	1.4	64.2	0
Kernel Oil	0	11.4	0	0	0	0	54.3	34.3
Margarine	7.1	42.8	0	0	0	2.9	34.3	12.9
Palm Oil	85.8	10.0	0	0	0	1.4	1.4	0
Groundnut Oil	5.7	2.9	0	0	0	1.4	15.7	74.3
Butter	1.4	0	0	0	0	0	2.9	95.8
Shea Butter	0	0	0	0	0	2.9	2.9	94.3
<u>Starchy Roots and Plantain</u>								
Cassava	62.9	27.1	0	0	0	0	10.0	0
Yam	15.7	81.4	0	0	0	2.9	0	0
Wateryam	0	88.6	0	0	0	1.4	1.4	8.5
Sweet potatoes	0	87.1	0	0	0	4.3	7.1	1.4
Plantain	8.6	87.1	0	0	0	1.4	0	1.4

APPENDIX I CONTD.

	Daily	A few time a week	Weekly	Forth- ingly	Monthly	Seaso- nally	Occa- siona- lly	Never
<u>Fruits and Vegetables</u>								
Mango	1.4	2.9	0	0	2.9	87.1	1.4	4.3
Orange	4.3	90.0	0	0	0	4.3	0	1.4
Pineapple	0	85.7	0	0	0	0	10.0	4.3
Banana	22.9	72.9	0	0	0	0	2.9	1.4
Watermelon	0	2.9	0	0	0	0	17.1	79.0
Grape Fruit	0	1.4	0	0	0	40.0	18.6	40.0
Leaves	78.6	11.4	0	0	0	5.7	4.3	0
Pawpaw	10.0	8.6	0	0	0	55.7	14.3	11.4
Garden Egg	92.9	4.3	0	0	0	0	0	2.9
Tomatoes	100.0	0	0	0	0	0	0	0
Onion	97.1	0	0	0	0	0	0	2.9
Pepper	94.3	0	0	0	0	0	1.4	4.3
Carrot	4.3	8.6	0	0	0	4.3	24.3	58.6
Cabbage	0	5.7	0	0	0	2.9	31.4	60.0
<u>Miscellaneous</u>								
Tea	7.1	54.3	2.9	0	0	0	18.6	17.1
Milo	65.7	18.6	0	0	0	0	15.7	0
Coffee	1.4	1.4	0	0	0	0	21.4	75.7
Fanta	4.3	0	0	0	0	0	74.3	21.4
Coca Cola	5.7	0	0	0	0	0	85.7	8.5
Ice Cream	5.7	0	0	0	0	0	78.6	15.7
Ice Lollies	0	0	0	0	0	4.3	68.6	27.2
Yoghurt	0	0	0	0	0	2.9	34.3	62.8
Vit. Supplements								

APPENDIX 2**PAYDOUGH RECIPE**

1 Cup flour

$\frac{1}{2}$ T Salt

2 T Vegetable oil

1 T Alum

$\frac{1}{2}$ Cup Water

Method: Mix all ingredients

Add $\frac{1}{2}$ cup of water and mix

Knead like bread dough

(The water should be added until the dough is quite elastic but not too sticky).

APPENDIX 3

THE WATERLOO CLASSIFICATION

Weight-for-age Degree of Stunting	Weight-for-height Degree of Wasting			
	>90% (0)	80-90% (1)	70-80% (2)	<70% (3)
>90% (Grade=0)	Normal		Wasting	
95-90% (Grade=1)				
85-90% (Grade=2)	Stunting		Stunting & Wasting	
<85% (Grade=3)				

The Waterloo classification Adapted from Gibson (1989)

APPENDIX 4
STUDY QUESTIONNAIRE

The relationship between Women's Economic Activities and the Feeding of their Pre-School Children.

The Case of Ho in the Volta Region.

House No.

1. Demographic and Socio-Economic Characteristics.

- (1) Name of Study Child
- (2) Sex: 1. Male [] 2. Female: []
- (3) Age of Child.....
- (4) Age of Mother..... Father.....
- (5) 1. 16-20 []
2. 21-25 []
3. 26-30 []
4. 31-35 []
5. 36-40 []
6. 41-45 []
7. 46-50 []
8. 50 []
- (6) Marital Status of Mother
- (5) 1. Single []
2. Married []
3. Divorced []
4. Separated []
5. Widowed []
- (7) If married, do you live together with your husband?
- Yes [] No []
- (8) Educational level, Highest Level attained
-
- | | Mother | (9) | Father |
|----------------------------|--------|-----|--------|
| 1. Primary | [] | | [] |
| 2. Middle/JSS | [] | | [] |
| 3. Secondary/Comm./Voc. | [] | | [] |
| 4. Teacher Tr./Poly/Agric. | [] | | [] |
| 5. University | [] | | [] |
| 6. None | [] | | [] |
| 7. Other (Specify) | | | |

- (10) Primary occupation of parents:
- (a) Mother:
-
- (b) Father:
-
- (ii) Secondary Occupation:
- (a) Mother:
-
- (b) Father:
-
- (11) Ethnic Background:
-
- (12) Religion:
- (13) Where was the study child delivered?
1. Hospital []
2. Health Centre/Health post []
3. Clinic []
4. Maternity Home []
5. At Home []
6. At the TBA's house []
7. Other (Specify) []
- (14) Did you attend Maternal and Child Welfare Clinic
with the study child?
- Yes [] No []
- (15) In what ways does the father contribute towards the
feeding of the child?
-
-

ABOUT MOTHER

- (16) How much do you earn per week or month from your:
- (a) Primary Occupation:
- (b) Secondary Occupation:
- (17) What are your working hours?
From: To:
- (18) How far is your work place from home?
.....
- (19) How many children do you have alive?
- | | |
|--------|--------|
| 1. [] | 4. [] |
| 2. [] | 5. [] |
| 3. [] | 6. [] |
- (20) How old are the children?
- | | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|

FEEDING PRACTICES

- (21) Do you breast feed your new borns:
1. Yes [] 2. No [] (If no go to Q. 23)
- (22) If yes, how long do you normally breast feed your children?
.....
- (23) If No, why?
- (24) Do you breast feed the study child?
1. Yes [] 2. No [] (If no go to Q. 23)
- (25) If yes, at what age did you stop breast feeding the study child?
.....
- (26) Why?
- (27) If No, why not?
1. No breast milk [] 2. Mother gone to work []
3. Child allergic to milk [] 4. Child can't such []
- (28) What did you feed the child then?
.....

- (29) How did you stop breast feeding?
 1. Gradually [] 2. Abruptly []
- (30) What method did you apply to stop breast feeding?

- (31) At what age did you start giving the study child
 supplementary foods:

- (32) How many times did you feed the child in a day?

- (33) What foods did you give the child?

- (34) How did you introduce the supplementary foods to the
 child:
 1. By hand [] 2. Forced Feeding []
 3. Cup and Spoon [] 4. Bottle Feeding []

III. CHILD CARE ARRANGEMENTS

- (35) Do you take your child along to work?
 1. Yes [] 2. No [] (If yes go to Q43)
- (36) If No, where do you leave the child?
 1. At Home []
 2. In a neighbour's house []
 3. In a nursery school []
 4. Other (Specify) []
- (37) Who takes care of the child in your absence?
 1. A househelp []
 2. Neighbour []
 3. A relative (Specify)
 4. In a nursery school []
 5. Sibling []
 6. Other (Specify)

- (38) Who feeds the child in your absence?
1. A househelp []
 2. Neighbour []
 3. A relative (Specify)
 4. In a nursery school []
 5. Sibling []
 6. Other (Specify)
- (39) Who prepares the meals?
1. A househelp []
 2. Neighbour []
 3. A relative (Specify)
 4. In a nursery school []
 5. Sibling []
 6. Other (Specify)
- (40) Personal particulars of the Caretaker:
1. Age
 - (ii) **Educational level:**
 1. Primary [] []
 2. Middle/JSS [] []
 3. Vocational/Secondary [] []
 4. None [] []
 5. Other (Specify)
 - (iii) How did you get her?
 - (iv) How much do you pay her?
 - (v) Relationship of helper to family:
- (41) Do you feel comfortable with the child care arrangement you have made?
1. Yes []
 2. No []
- (42) If Yes, what way?
- (43) If No, why not?
- (44) If Yes, (Q.34) how many times do you feed the child in a day at work?

(45) On what foods do you feed the child at work?

.....

(46) Who prepares the meals?

1. Myself [] []

2. Househelp [] []

3. Relative (Specify) [] []

4. Food Vendor [] []

5. Other (Specify)

(47) Are there any foods you would not feed your child on?

1. Yes [] 2. No []

(48) If Yes, list the foods and give reasons

LIST	REASONS

(49) Who eats with the study child?

.....

(50) If you have the choice would you prefer being a

full-time housewife to being a working mother? Give reasons

LIST	REASONS
NO	REASONS

(58) How often do you feed the following food items to the study Child?

Food Group & Food Item	Daily	Few Times a week	Weekly	Fort-nightly	Monthly	Seasonally	Never
<u>Animal Products</u>							
Fresh Meat							
Bush Meat							
Poultry							
Smoked Fish							
Fried Fish							
Dried Fish							
Tined Fish							
Egg							
Milk							
Snail							
<u>Cereals and Cereal Products</u>							
Bread							
Biscuit							
Wheat-Soy-Blend							
Weanimix							
<u>Lecumes & Oils</u>							
<u>Seeds</u>							
Beans							
Groundnuts							
Agushie							
Soyabeans							
Palmnuts							

Food Group & Food Item	Daily	Few Times a week	Weekly	Fort-nightly	Monthly	Seasonally	Never
<u>starchy roots and Plantain</u>							
Cassava							
Yam							
Water Yam							
Plantain							
Cocoyam							
Sweet Potatoes							
<u>Fats and Oils</u>							
Refined Cooking Oil							
Coconut oil							
Kernel oil							
Groundnut oil							
Palm oil							
Margarine							
Butter							
Shea butter							
<u>Fruits and Vegetables</u>							
Banana							
Orange							
Pineapple							
Pawpaw							
Mango							

Food Group & Food Item	Daily	Few Times a week	Weekly	Fort-nightly	Monthly	Seasonally	Never
<u>Fruits and Vegetables</u>							
Watermelon							
Garden egg							
Onion							
Carrot							
Pepper							
Carrot							
<u>Miscellaneous</u>							
Tea							
Milo							
Ovaltine							
Bournvita							
Coffee							
Fanta							
Coca Cola							
Ice Cream							
Ice Lollies							
Yoghurt							
Vitamin Supplement							
Others (specify)							

APPENDIX 5

FORMULA FOR CALCULATING MEAN ADEQUACY RATIO

$$\text{NAR} = \frac{\text{Subject's daily intake of a nutrient}}{\text{RDA of that nutrient}}$$

Average of the Nutrient Adequacy Ratio (NAR) value for each of the selected nutrients yeild a mean adequacy ratio (MAR)

$$\text{MAR} = \frac{\text{Sum of the NARs for X nutrients}}{X}$$

STAPLES CONVERSION TABLE

Staples, Soups, Stews and Porridge (weights in grams)

FOOD	Tbsp	Stew Ladle	Soup Ladle	Cup
Mash Plantain	---	50	120	---
Gari Fortor	---	40	85	180
Mpotompoto	---	65	150	280
Mash Yam	---	60	135	225
Rice	---	40	70	185
Koko	---	45	105	280
Palm Soup	15	40	95	270
Kontomire Soup	15	35	90	265
Groundnut Soup	15	35	95	270
Okro Soup	15	40	95	270
Light Soup	15	35	95	270
Tomato Stew	15	45	95	270
Kontomire Stew	20	50	110	275
Garden Egg Stew	20	50	115	280
Okro Stew	20	45	105	265
Cabbage Stew	15	40	95	250
Fish Stew	15	45	105	270
Egg Stew	15	45	105	270
Groundnut Stew	15	45	105	275
Bean Stew	20	50	115	280
Egushie Stew	15	45	105	275
Hot Pepper	15	45	105	270

Fruits and Plantain (weight in grams)

Boiled Unripe Plantain

	Width (inches)	
1	1.25	1.5 2
Grams per inch of length	18	22 25 35

Banana	Length (inches)	Edible Portion (grams)
	3	40
	4	50

Oranges	Circumference (inches)	Edible Portion (grams)	Circumference (inches)	Edible Portion (grams)
	6	35	8.5	100
	6.5	45	9	120
	7	55	9.5	140
	7.5	70	10	160
	8	85		

Source : Furgeson, (1990)

Appendix 7

PLAYDOUGH CONVERSION TABLE



A. Circumference Conversion Factors

Circumference (inches)	Banku (grams)	Fufu-Cassava (grams)	Fufu-Cassava & plantain	Konkonte (grams)
3.5	---	15	15	15
4	25	25	25	25
4.5	35	40	40	35
5	45	50	50	50
5.5	60	60	60	60
6	75	80	80	80
6.5	95	100	105	105
7	120	130	130	130
7.5	145	155	155	155
8	175	185	190	190
8.5	200	215	220	220
9	250	265	270	270
9.5	300	320	325	325
10	350	370	380	375
10.5	410	425	430	425
11	460	490	500	495

B. Weight Conversion Factors

Weight Ratios	0.80	0.85	0.87	0.86
---------------	------	------	------	------

Source: Furgeson, (1990).