# A STUDY ON THE EFFECT OF THE MOTHER'S DIET DURING LACTATION ON MILK COMPOSITION AND ANTHROPOMETRIC MEASURES OF THE CHILD

Thesis

Presented By

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TO

MY HASBAND NAGUIB

TO

MY CHILDREN HIBA, OLA, and MOHAMED

TO

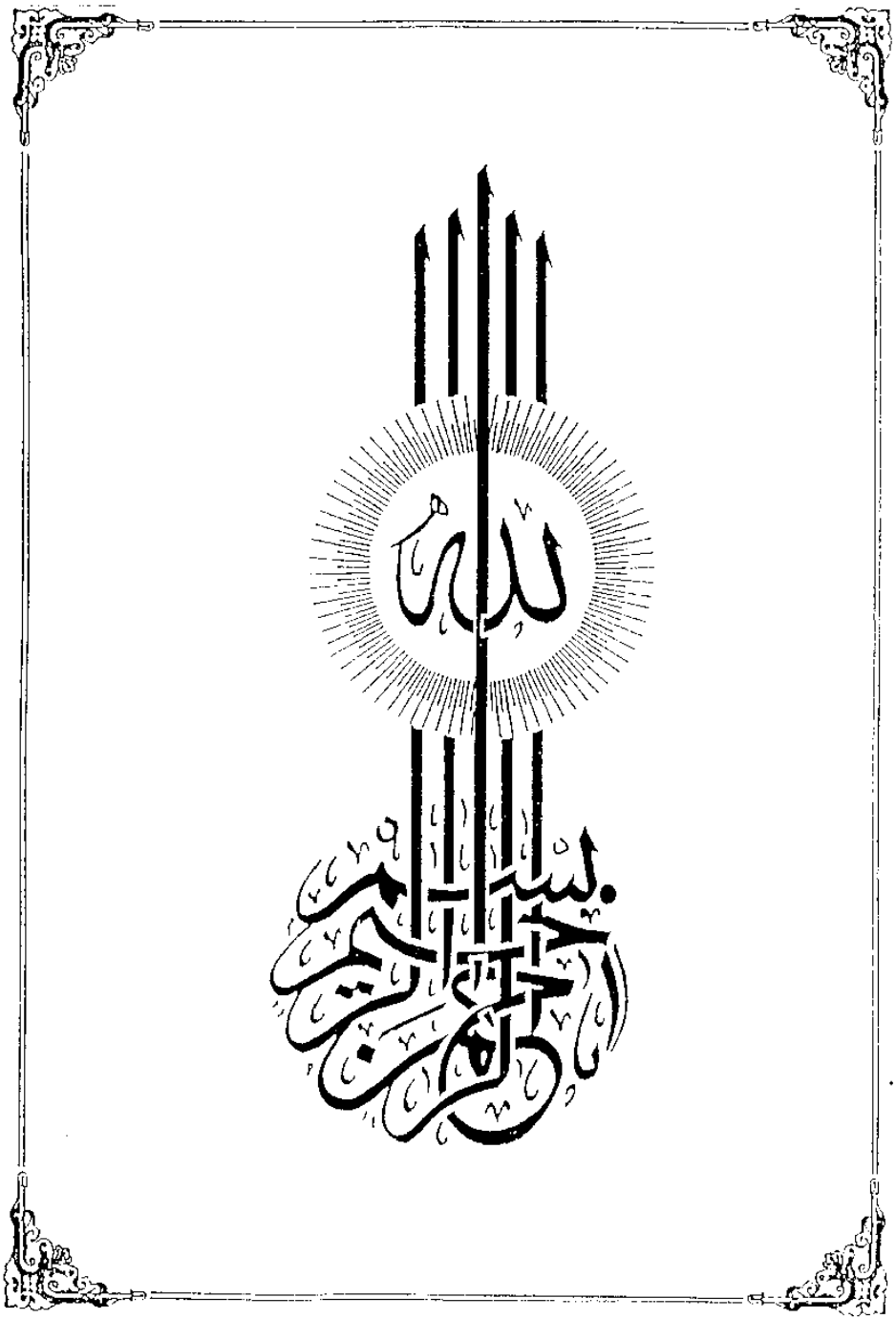
MY BELOVED PARENTS

TO

MY DEAR FRIEND NASRA

I PRESENTED THIS WORK

AMAL 1987



A STUDY ON THE EFFECT OF THE MOTHER'S DIET DURING LACTATION ON MILK COMPOSITION AND ANTHROPOMETRIC MEASURES OF THE CHILD

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C O N T E N T S

# S U M M A R Y

This study was carried out in Bortus Village (Oseem District, Giza Governorate), on nursing mothers attending Bortus Hospital out patient clinic for MCH services and their infants who have not completed their weaning.

The study was done on 114 mothers and equal number of their children (64 males, 50 females). They were all from the same village. The study was done on nursing mothers at different stages of lactation. The study was concentrated on:

1- The assessment of the food intake of lactating mothers to find out its effect on breast milk composition.
2- The assessment of the growth of infants recieving breast milk.

Dietary intake of the mothers over the preceding 24 hour was recorded on the day of the visit. A milk sample from each mother and the anthropometric measurements of her child were also obtained.

The nutrient content of the daily diet of nursing mothers in relation to their RDA is one parameter of evaluating their nutritional status. The mean daily caloric intake (1951) of lactating mothers of this study was not satisfactory (76.3% of RDA), while the mean daily protein intake of them (64.8g) could be

considered satisfactory (101% of RDA). However, the majority of protein intake was from plant source. The average calcium intake constituted 26.3% of daily RDA of lactating mothers. This is due to low intake of foods rich in calcium. The mean iron intake was low (81.5% of RDA) inspite of high protein intake , and this may be due to low intake of animal protein. The low average daily intake of vitamin A by lactating mothers (19.3% of the RDA) is due to low intake of food rich in carotene and vitamin A . The thiamin intake satisfy nearly the RDA (93.3%), this is due to the high consumption of bread. The mean intake of vitamin $B_2$ exceed the RDA (134.7%). The lactating mothers get less than 50% of RDA of vitamin C as a result of low intake of fresh vegetables and fruits.

Determination of the major breast milk constituents was carried out in this study to detect any effect of maternal diet on milk composition. It was found that the mean value of breast milk protein was 1.2±0.52g% and it tends to decrease by prolonged period of lactation. The study showed that the mean value of fat content was 4.66±1.3g% with a higher concentration of milk fat among mothers who lactate female children than those of other sex. The mean lactose content was 8.51±0.88g%. As regards mineral content in human milk, this study showed a low level of calcium content in the milk samples (12.92mg%). This can be attributed to the low intake of calcium in the mother`s diet. On the other

hand the mean inorganic phosphorus content was within the normal limits (11.16mg%). As a result of these findings the Ca:P ratio was below the normal (1.15:1). This is due to the low of calcium in milk while the phosphorus within the normal limit.

From the above mentioned results,it was found that although the average intake of lactating mothers is deficient in some of the nutrients, the milk composition in this study was not affected by the energy or protein content in the diet. Also there is no correlation between dietary fat and milk fat. As regards minerals content, it was found that the milk calcium was affected by the calcium intake by lactating mothers.

Concerning the infant growth, inspite of the normal composition of the milk samples obtained in this study, it was found that the growth of infants was below normal. At the age group (< 3 months) the mean weight of both sexes was within the normal level as compared with the standard (106.0--94.7%) for male and female respectively. The mean weight was less than the reference standered after the age of 3 months. This can be attributed to possible infection, particularly gastroentritis.This was accompanied by the continous diminished concentration of milk protein after the first 3 months of lactation. Also the same finding was observed in body length where the mean value of body length in the first age group(< 3 months) was within the normal limits

at both groups (101.2- 97.0%) for males and females respectively. Then it began to decreased by the advance of age to reach its lowest level at the age of 24 month. The chest/head ratio was less than one in almost all age groups. The arm circumference was within the normal limit up to 6 months of age in both sexes then from 6 months onwards all infants fell in the category 70% to less than 90% of the standered arm circumference for the corresponding age as a result of varying degrees of undernutrition. The mean value of skin-fold thickness in both sexes increased by age up to 5 months, then decreased for both groups due to the decreased of fat concentration in human milk at the corresponding period.

Generally the growth of breast fed infant was found to coincide with the standered values in the first and second months, then gradual decline was found to occur.

# INTRODUCTION

Nutrition is considered one of the most important factors in maintenance of health. Health is not only a satisfactory nutritional state and lack of disease, but it also includes proper psychological and social well being. Diet is responsible for the growth, activity and the balanced behaviour of the living organism. (Jelliffe & Jelliffe, 1978)

The nutritional requirements of children differ from those of adults because in addition of providing energy and replacement of tissue, they are also needed for growth which involves an increase in the size of body tissues. Also many of the child's organs have a functional capacity which differ from that of the adults, particularly in case of the premature infants. The highest rate of growth is noticed in infancy, which depends on the production of an adequate amount of proper milk ( Mclaren and Burman, 1982).

The amount and composition of mother's milk depend on mother's health and her dietary intake. There is no doubt concerning the importance of breast milk for survival of the infant, especially when we consider the breast milk as the sole nutritional food of the infant especially during the first few months of his life, while thereafter it is possible to substitute mother's milk by cow's milk with no ill-effect to the child. (Davidson, et, al, 1961)

The infants are in need for certain elements in various proportions in order to attain healthy life. Milk is the normal fluid secreted by the mammary gland for feeding the young for a period of time. Then, it must be well-balanced and enough for the baby need.(Kon and Cowie,1961).

Milk almost contains substances that are important for normal health and growth of the baby in the early period of life. It does not only contain the essential constituents required for the baby, but also these constituents exist in the proper proportion.(Howthorn & Leitch, 1962)

Human milk is available for the baby from his mother, fresh, sterile, and attaining the proper temperature for the baby. It is characterised by being highly digestable, posses a unique composition and containing the antibodies needed for the protection of the baby against infection.(Osman, 1983) Milk is secreted with a composition and quality suitable for each species, i.e. mothers milk is the best for the human baby, while cow's milk is the best for the calf.(Nasser, et, al,1978)

On the other hand , lactation performance is much related to the nutritional, endocrinal and psycological state of the mother. It is well known that the inadequate nutrition of the mother results in a reduced milk secretion .(Awad,1980)

Thus, the diet of the mother must contain enough calories and nutrients to compensate for the constituents secreted in milk. The health of the infants and children depends on the mother's health, and in the industerialised countries the problems of the maternal and child's health are largely of the psyco-social type and mainly related to the family environment. Infant's nutrition is not considered just providing the baby with the essential nutrients in adequate amounts but also includes a osyco-social milieu in which the iteraction between the mother and infant is considered of prime importance. (Jelliffe & Jelliffe,1978)

The mother's nutritional status is critical for adequate breast milk. It has often been demonstrated that even grossly malnourished mothers manage to produce enough milk to keep their children alive.(EL-Sayed& El-Bagdadi, 1981)

Hytten and Thompson (1961), did not find relation between maternal nutrition and lactation, Gopalan and Belvady, (1961) added that lactation performance is well maintained inspite of very inadequate intake of energy.

Mother's milk and in sufficient quantity, is probably the best food for infants especially in the first months of life. Its chemical composition, particularly in term of protein, fats,