

**BIOCHEMICAL COMPOSITION OF
BREAST MILK IN PRETERM AND
FULLTERM INFANTS IN HIGH
SOCIOECONOMIC CLASS**

A THESIS

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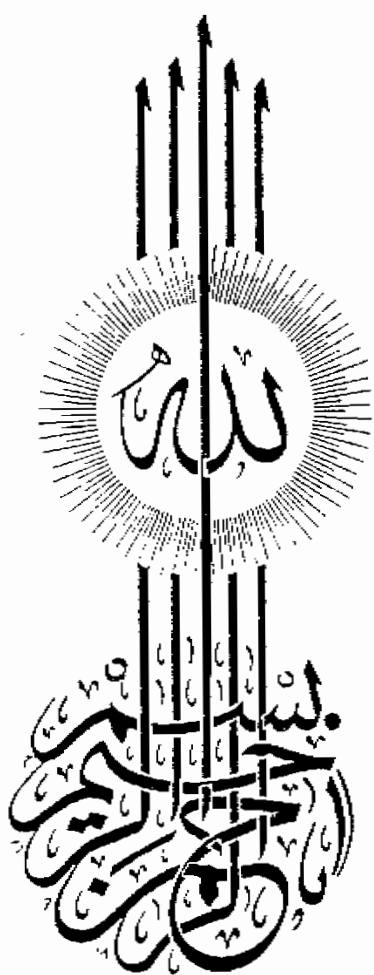
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INTRODUCTION

INTRODUCTION AND AIM OF WORK

Nutrition is the basis of child health.

A knowledge of its essentials is necessary for all physicians and most of all for pediatricians, as it is during the early years that health and growth depend most on an adequate and properly balanced nutrient intake. [Jelliffe and Jelliffe, 1978 a].

It is found, especially in developing countries, that breast feeding is not only the most natural but also the safest, most economical and most healthy way of feeding the infant. [Jelliffe and Jelliffe, 1978 a]

Breast feeding is commonly recommended on psychological grounds as it helps providing a more intimate relationship that will benefit mother and child. [Mackeith and Wood 1971].

Human milk can supply all nutritional needs for optimal growth for at least the first months of life provided that the infant is born with adequate fetal stores and ultra violet irradiation of the skin. [McLaren and Burman, 1976].

Breast milk has the advantage of being always readily available at the proper temperature and no time is required for its preparation. It is also fresh and free

of contaminating bacteria so that the chances of gastrointestinal disturbances are lessened. [Barness,1983].

There is an increased desire among mothers giving birth prematurely to provide expressed milk for their small hospitalized infants. However there is little information on the nutrient composition of the early milk produced by mothers giving birth prematurely. On the reverse there is relatively complete information on the composition of milk from mothers giving birth at term. [Anderson et al,1981].

The aim of the work is to find if there is difference in breast milk composition between preterm and fullterm infants in high socioeconomic class.

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REVIEW

REVIEW OF LITERATURE

1 - BREAST FEEDING

Breast feeding is generally the safest and most desirable method of nourishing a baby. Human breast milk is considered the ideal starting food; with an adequate supply of human milk most of the nutritional requirements of the newborn are met; except for iron and vitamin D. [Burton , 1976].

Breast milk is neutral, correctly proportioned food for human infants. Protein, mainly lactalbumin forms small curds. Fat is well absorbed and contains more essential and long chain polyunsaturated fatty acids than cow milk [Short et al.,1978].

Exclusive breast feeding can support adequate infant growth throughout the first 4 to 6 months of life [Butte et al.,1984].

There is accelerated weight gain in exclusively breast fed infants during the first 1:3 months. Thereafter a slower rate for a couple of months, a phenomenon which has erroneously been interpreted as growth failure due to

underfeeding [Hanson et al.,1983].

Human milk is adequate for growth and bone mineralization for the first year of life. When environmental and social conditions are favorable, daily vitamin D supplementation of breast fed infants may not be necessary. It is the responsibility of the health care provider, to ascertain that proper maternal conditions have prevailed during pregnancy and lactation, before not recommending vitamin D supplementation [Chan et al.,1982].

Studies concerning breast feeding in well nourished communities show that no extra nutrients are needed in the first 6 months of life, as judged by serial growth measurements and general "good health". Clinical nutritional deficiency is uncommon in the breast-fed infant in the first four to six months, but is frequently seen in the bottle fed baby in the form of infantile obesity in the well to do and of marasmus in the underprivileged [Jelliffe and Jelliffe, 1978 a]

The nutritional adequacy of breast milk for the infant can be roughly assessed by measuring 24-hour output and chemical composition, or by recording of satisfactory growth "good health" and absence of clinical malnutrition [Jelliffe and Jelliffe,1978 b]

The duration of breast feeding varies considerably in different cultural and socioeconomic groups and is basically a question of convenience, attitudes and tradition. Prolonged breast feeding, particularly in unprivileged groups, may have many advantages and should therefore be encouraged [Hanson et al.,1983].

There is a great advantage of breast feeding especially where mothers of restricted education and intelligence are concerned. Also where health instructions reaching the mother are poor; and where hygiene is of low standard and where milk supplies are delivered irregularly or cannot be adequately stored. This particularly applies to developing countries where maintenance of breast feeding is critical for survival and for adequate nutrition. Positive massmedia encouragement is required; such as advertizing in the television, radio, newspapers and magazines. [Arneil and Stroud, 1984].

Breast feeding should be encouraged among mothers living in underprivileged areas. Breast feeding endows the infant with maximal nutritive benefits derived from high biologic protein. Breast milk is the only means which can inexpensively provide this protein besides its added

anti-infective benefits. [Gellis and Kagan, 1978] .

Many allergists recommend that breast milk is to be given to the infant with a strong family history of allergy [Gellis and Kagan ,1978] , as allergy to breast milk is very rare [Short et al.,1978].

Breast milk may protect the infant , and the mother's breast from infection, by the presence of lymphocytes, neutrophils and macrophages as well as lysozyme [Jelliffe and Jelliffe ,1971].

The feces of breast fed infants contain a higher concentration of lactobacillus bifidus and a lower content of escherichia coli than bottle fed. The latter's stools also contain proteus and pseudomonas aeruginosa and their throats are more frequently colonized with E-coli. Clinical enteric infections are less common in the breast fed and breast feeding has enabled epidemics in nurseries to be controlled after all other measures have failed [McLaren and Burman,1976]

It is evident that feeding of human milk promotes establishment of a gastrointestinal bifidobacterial flora [Goldman and Smith ,1973].

The difference between human milk and cow milk in this respect is related to the presence, in human milk , of a group of nitrogen containing polysaccharides the "bifidus factor " not present in appreciable concentrations in cow milk [Gyorgy ,1971]. The PH of stools of breast fed infants is generally somewhat less than that of infants receiving other milk, apparently because of production of acetic and lactic acids by lactobacillus. The acid environment inhibits, invitro, the growth of E-coli, yeast and shigella. Possibly similar inhibition occurs in vivo [Fomon and Filer,1974].

Growth factor contributing to lactobacillus bifidus proliferation includes non specific conditions, such as the low buffering capacity of human milk and the high lactose content, which promote an acid milieu within the colon and thereby prevents overgrowth of shigella, E-coli and candida organisms. In addition to these non specific factors, glycoproteins in milk are thought to promote the proliferation of these organisms. [Walker, 1980].

Human milk has a caloric value of approximately 70 calories per 100 ml and the average infant caloric requirements will therefore be supplied by 150 ml per kg body weight per day, which will also satisfy his needs for

fluid. In practice, it is found that many large active babies take considerably more than this amount [Mitchell, 1970].

A large number of enzymes are known to be present in human milk and cow milk. However, it seems probable that these enzymes are nearly all destroyed in passage through the stomach and are of little nutritional significance [Fomon and Filer, 1974].

One of the benefits of breast feeding is protection against iron deficiency, the most common cause of nutritional anemia in infancy, even if both human and cow milk share similar low iron content [Arosio and Ponzone, 1984].

The supply of breast milk is partly dependent on demand and the most important stimulus to secretion is a vigorously hungry infant who empties the breast at each feed. [Milchell, 1970].

Breast feeding is more common in rural than in urban areas. In many parts of the world the incidence of breast feeding approaches 100 percent [Holt et al., 1961]. Helsing and Kjoernes [1985] stated that breast feeding has become more common today in many industrialized countries