MILK FEEDING AND INFECTIONS DURING INFANCY

THESIS SUBMITTED FOR THE PARTIAL
FULFILMENT FOR THE MASTER DEGREE
IN PEDIATRICS

BY
REFAAT EBRAHIM MOHAMED EL-BARBARY
M.B.B.Ch., D.M.

SUPERVISED BY
PROFESSOR ABD EL-KHALIK KHATTAB
M.D.,"AIN-SHMAS", Ph.D. "Ed"", F.R.C.P. "Ed",
M.R.C.P "Glasg", D.CH.
PROFESSOR OF PEDIATRICS
FACULTY OF MEDICINE,
AIN SHAMS UNIVERSITY

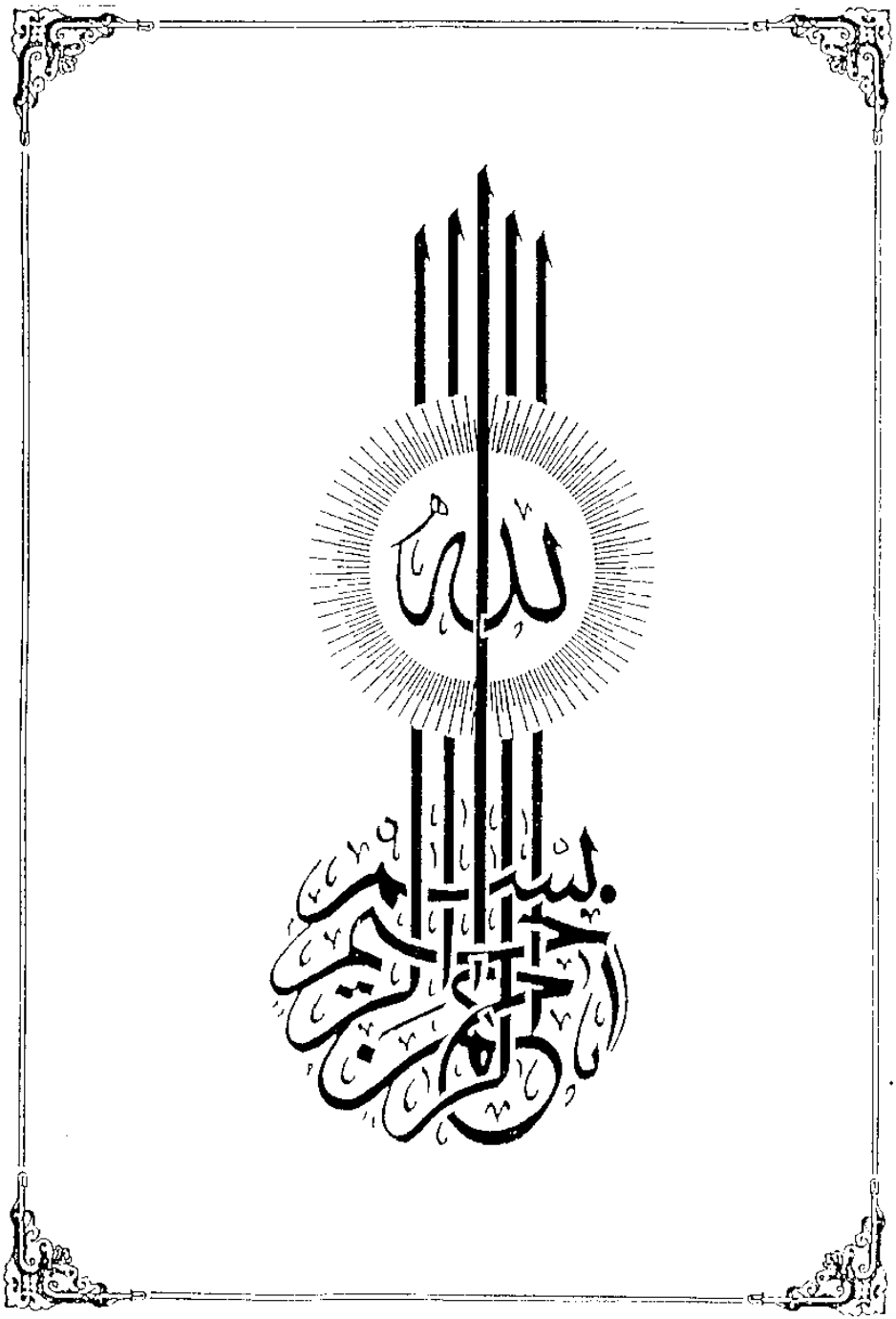
1983

ACKNOWLEDGEMENT

I would like to express my deepest gratitude to my Professor Dr. Abd El-Khalik Khattab, Professor of Pediatrics, Faculty of Medicine, Ain Shams University who suggested the subject of this work, his continuous encouragement, supervision and guidance were indispensable help to me during the compilement of this essay.

I am also indebted to him for his teaching me humanity. To him I want to express my thanks and appreciation.

Refaat Ebrahim El-Barbary



CONTENTS

AIMS OF THE REVIEW

This is mainly intended to show the interaction between the type of milk "breast and artificial milk" used in infant feeding, so the aim of this essay is to review the advantages of breast feeding and relationship between the type of feeding of the infant and its susceptibility to different infections.

INTRODUCTION

INTRODUCTION

"There is a reason behind everything in nature" Referring to the above citation from Aristole, it is rational to suppose that the very different milk produced by each type of mammal would be uniquely species-specific. For example, cold water mammals such as whale, produce milk of high fat, high caloric value. Whereas rabbit milk contain 14% protein (compared with 0.9% in human), probably related to the very rapid growth of their offspring, who double their birth weight in six days, compared with 140 days needed by the human infant (Blaxter, 1961).

Breast milk is the natural food for full term infants, it is always readily available at the proper temperature and no time is required in preparation. The milk is fresh and free of contaminating bacteria, so that the chances of gastrointestinal disturbances are lessened.

In this essay the following points will be covered and discussed :

1- The role of breast feeding versus artificial feeding in infancy during the twentieth century.

2- Composition of different types of milk.

3- Advantages of breast-feeding.

4- Technique of breast-feeding.

5- Difficulties and contraindications of breast feeding.

6- Choice of artificial milk.

7- The relationship between the type of feeding of the infant and its susceptibility to different infections especially gastro-entritis and chest infections.

Finally, I hope that many colleague will find this to be a source of an interesting reading.

HISTORICAL REVIEW

THE ROLE OF BREAST FEEDING VERSUS ARTIFICIAL FEEDING IN INFANCY DURING THE TWENTIETH CENTURY

Artificial Feeding of Infants-a Historical Review :

All traditional societies recognise the importance of breast milk for the survival of the infant.

Anthropological literature is full of descriptions of how peasant societies cope with the infant for whom mother's milk is not available because of illness or death. The commonest way is for such an infant to be fed by a close relative within the extended family system or within the clan. In the fifteenth-and sixteenth-century writings in Western Europe there is very little mention of artificial feeding, and breast feeding has been emphasised. (Wickes 1953).

The wet nurse :

The wet nurse was firmly established in the Western tradition. It is known that in Homeric Greece (950 B.C.) wet nurses were in frequent demand, particularly by women of higher social class. They were

given due importance in the household and held positions of authority and responsibility over the servants and slaves, and often continued to look after their charges until adolescence.

The eighteenth century was the peak period for wet nurses in Europe. Ladies of quality did not breast fed because it was unfashionable, and feared that it may injure their health or ruin their figures, but above all, because it interferred with social rounds or official duties. The practice of wet nursing also gave rise to several abuses. It offered a lucrature employment to young women from the poorer class, who managed to get themselves pregnant and then "overlaid" or "lost" the infant in order to find employment in a well-to-do household as a wet nurse.

It was not uncommon to find abandoned children on the streets of many of the large cities. Moreover, it was now widely known that venereal infection, especially syphilis, could be transmitted to the infant by his wet nurse.

The tide of social opinion was turning against the wet nurse not only on moral and religious grounds, but also because some of their practices were shown to be dangerous. (Wickes 1953).

Towards the end of the ninteenth century wet nurses were rarely employed in England, although in France and Russia were part of the regular staff of the foundling hospitals.

In the early years of the twentieth century the use of wet nurses diminished to vanishing-point even on the continent of Europe, but, because of the well-recognised importance of breast milk, milk banks for expressed breast milk were established in several large cities. (Wickes 1953).

Use of Animal Milk for Infant Feeding :

In the nineteenth century it was already known that assis milk was the closest to human milk as regards the chemical constituents.

Pierre Budin, at the Maternite in Paris, was beginning to use cow's milk, which was more easily available than assis or goat's milks. The milk was given out daily, pre-sterilised and sealed in bottles each containing the approximate amount required for one feed. The problem with the use of fresh cow's milk in infant feeding was adultration and lack of cleanliness. Another problem with cow's milk was its digestibility. Early studies and observations had shown that it forms large and tough

curds as compared to human milk. The easiest approach was to reduce the protein content by dilution with water, or barley water, with sugar added. Acidification was another method used to improve the digestibility of milk. (Jelliffe and Jelliffe 1978).

Condensed milk was introduced in the artificial feeding of infants towards the latter part of nineteenth century. The process was patented in 1835. Fresh cow's milk was heated to 212^{o}F (100^{o}C) to destroy the bacteria, and then evaporated in a partial vacuum to less than a quarter of the volume into a viscous honey-like substance, which was found to keep longer than ordinary milk. Sugar was added as a preservative in the proportion of 6 ounces to a pint. At first it was sold in wax-capped bottles until 1866 when Nestle marketed the first condensed milk in tin boxes.

Towards the end of the nineteenth century the main commercial use of cow's milk was for the production of cream and butter. Milk seperators were being used in Britain 1885 and cream appeared on the market in large quantities in 1895. The seperated milk was usually sold back to the farmers for use in cooking.

The easy availability of sepenated milk and cream in large quantities led to the establishment of milk laboratories which undertook the preparation of feeds for infants.

The first such laboratory was set up in Boston in 1892, followed by another in New York in 1893, and after that several cities in the United States and Europe followed suit. (Bond et al., 1979).

The use of powdered cow's milk in infant feeding:

The first machine was introduced in England in 1902 and soon the separated milk, after the removal of cream, was being sold in the powdered form for use in baking and for making puddings.

In 1904 reports were published by the Carnegie Laboratory in New-York showing the benificial results of feeding the poor tenement children of that city on dried milks.

Advertisements for dried full-cream, half-cream and separated milk were carried in the medical officer of 3 october 1908.

In 1908 a large quantity of dried milk powder from New Zealand was marketed in Britain and sold under the brand name of "Glaxo".

In 1919 a formula was promoted under the proprietary name of Scientific Milk Adaptation (S.M.A. for short) in which the fat of cow's milk was replaced by a mixture of cod liver and tallow. (Chojnowski et al., 1976).

This preparation was sold until 1935, when it was shown that the fat in it was poorly absorbed by the infant gut.

In addition, calcium and phosphorus formed soaps with the unabsorbed fat and were also lost as such. The recent formula is prepared so that, the fat of cow's milk is replaced by a mixture of vegetable oils like cocnut, cottonseed and soya oil.

Attempts are also continuing to adjust the protein content of the powdered milks. All of them suffer the same disadvantages as cow's milk, on which they are based.