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NO. 83

U. S. DEPARTMENT OF LABOR

JAMES J. DAVIS, Secretary

CHILDREN'S BUREAU

JULIA C. LATHROP, Chief

BREAST FEEDING

CARE OF CHILDREN SERIES No. 5

Bureau Publication No. 83



WASHINGTON
GOVERNMENT PRINTING OFFICE
1921

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LETTER OF TRANSMITTAL.

U. S. DEPARTMENT OF LABOR,
CHILDREN'S BUREAU,
Washington, May 2, 1921.

SIR: The following monograph on Breast Feeding has been prepared by Ella Oppenheimer, M. D., for the Children's Bureau, for the purpose of aiding the efforts of doctors and nurses to encourage maternal nursing. It is offered in the belief that the degree of maternal nursing in the United States may be increased and that such increase offers the hope of saving life in many cases and of improving infant vigor.

JULIA C. LATHROP, *Chief.*

Hon. JAMES J. DAVIS,
Secretary of Labor.

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BREAST FEEDING.

To the notable reduction in infant mortality during the past decade the encouragement of breast feeding, improved economic conditions, purification of milk supplies, advancement of scientific knowledge of the nutritional needs of infants, education of mothers in the artificial feeding of infants, have all contributed. It is unnecessary to minimize the value of any of these other factors in order to emphasize the point that breast feeding has been the most important single factor.

The experience of centuries, as well as scientific laboratory studies, has demonstrated that in nutritional properties, in purity and cleanliness, in warmth, in protective powers against infection, and in the assurance it gives a child of a mother's care, human milk can never be replaced adequately by artificial food. The nourishment of an infant with anything other than the secretion of the human breast is properly termed "artificial feeding," or "substitute feeding." The problem is often one of the most difficult which the physician encounters. The fact that the diet is other than the natural one renders an absolute solution of the problem impossible, since science has as yet been unable to construct a food which is exactly like human milk, and each child is an individual to whom general rules can apply only in a general way.

That successful maternal nursing is possible for the vast majority of women has been amply proved. It was brought out strikingly by the experience of the European countries during the recent war, of France in 1870-71, of England during the cotton famine of 1861-1865, when maternal nursing was universally resorted to because of the scarcity of food. In this country the possibilities of breast feeding have been demonstrated by the increase in natural feeding under the encouragement of physicians and infant-welfare centers in many cities, and particularly by the recent breast-feeding campaign in Minnesota, which reached practically every mother in a given area and resulted in a per cent of breast feeding ranging from 96 at the end of the second month to 72 at the end of the ninth month.

In Boston the Baby Hygiene Association met with such success that of 6,000 infants under its supervision only 196 babies less than 6 months old were entirely artificially fed. The statistics of the Starr Center in Philadelphia are equally notable. In 1912-13 only 48 per cent of the babies under its care were breast fed. After six years of insistence on breast feeding, of 92 infants whose mothers had been cared for by the prenatal department, 90 were entirely breast fed at 1 month of age, 1 was partially breast fed, and only 1 was bottle fed.

The problem of breast feeding must be viewed in all its aspects. In our complicated modern society there must be widespread emphasis among *all* classes not only on the importance of breast feeding but also on the ways and means of making it successful. There are many false opinions to be overcome, such as the statement frequently made that modern woman has lost the ability to suckle her young, and the feeling created as a result of the emphasis on the importance of pure milk and pasteurization in infant feeding that this is at least as good and often better than breast feeding.

The problem of insuring breast feeding for babies includes economic, educational, and health aspects of far-reaching importance, for the possibility of every mother nursing her child implies an economic level which will make it unnecessary for the mother to go into industry while she is bearing children; it implies a training for motherhood which emphasizes not only the importance, but also the reasons for breast feeding; and its fulfillment demands sound physical and mental health of the mothers, based upon adequate prenatal, obstetrical, and general health care.

MORTALITY STATISTICS OF BREAST VERSUS ARTIFICIAL FEEDING.

Studies made in many different countries have demonstrated that the death rate among the artificially fed is at all times higher than among the breast fed; that where for any reason breast feeding is the custom, the mortality rate is low in spite of other unfavorable factors; and that when for any cause breast feeding is increased in a community the infant mortality rate is lowered. The studies of the Children's Bureau in New Bedford, Mass., Akron, Ohio, Manchester, N. H., and Brockton, Mass., have demonstrated that in these cities the mortality rate for the artificially fed is about three or four times as great as for the breast fed—the rate varying according to hygienic, economic, and industrial conditions. Again, in rural communities studied by the Children's Bureau, breast feeding is almost universal. In these communities, even with a very high mortality rate during the first month of life because of inadequate maternal care, the death rate from diarrheal diseases and the total infant mortality rate is low because of the prevalence of maternal nursing. A lowland county of North Carolina had an infant mortality rate of 56.3; a mountain county of North Carolina, 80.4; a rural county in Kansas, 55; and the town of Saginaw, Mich., 84.6.

In studies made in overcrowded and poverty-stricken districts of London, New York, Chicago, and other large cities the fact is very clearly brought out that where by race or custom it is the practice to feed infants at the breast the infant mortality rate is lower, even though the environment be highly insanitary. There is the instance of the low infant death rate obtaining among Jews, Italians, Scotch, and Irish when these races continue even under adverse circumstances to feed their infants at the breast.

OTHER FACTS INDICATING THE SUPERIORITY OF BREAST OVER ARTIFICIAL FEEDING.

Mortality figures alone, impressive though they are, do not tell the whole story. An extensive study of school children and military recruits in Germany pointed out that the good effect of breast feeding was manifested in later childhood and even in adult life. Nutritional disorders, not necessarily fatal but which permanently handicap the individual, occur much more frequently among the artificially than among the breast fed. These disorders render the infant much more susceptible to infection and may produce deformities of a permanent nature (rickets). Again, the chance for the survival of the premature, delicate, or syphilitic infant is almost entirely dependent upon the availability of breast milk as a food.

THE PRODUCTION OF HUMAN MILK.

Changes in the breasts preparatory to lactation make their appearance early in pregnancy. These changes are gradual, manifest themselves in enlargement of the breast tissue, especially of the nipples, and in the secretion of a small amount of fluid, clear and watery during the earlier months of pregnancy but toward the end of pregnancy and for the first few days after labor creamy in character. On the third or fourth day after labor the secretion of true milk begins. So closely correlated and so interdependent are the functions of childbearing and suckling that the act of nursing hastens the return of the pelvic organs to normal size and function.

Many efforts have been made to discover the factors which stimulate the breast to the secretion of milk, but as yet these are undetermined. All that can be said is that the removal of the child from the uterus probably releases into the blood stream a substance which stimulates the breast glands to an activity for which they were prepared by pregnancy. The glands once having secreted milk, their continued secretion is largely a matter of the demand made upon them. If a child does not suckle at the breast the secretion of milk quickly subsides. If a child is feeble and fails to empty the breast at each nursing the supply of milk may fail unless other means of emptying are used. On the other hand, the complete emptying of the breast by a strong child will not only maintain a good supply but will increase what was originally a poor supply. In other words, the greater the demand the greater the supply. It therefore follows that all factors in the child which lead to a diminution in the force of suckling and the remedies therefor need consideration in any campaign for promoting breast feeding. Such factors are:

1. Maturity and general development of the child: The premature and the puny child born at term frequently do not possess strength enough for forceful suckling.

2. General hygiene and technique of nursing.

Adequate quiet and sleep between feedings: Nursing by the clock, preferably at three or four hour intervals. The importance of this can hardly be overestimated. Too frequent feeding of the baby results in a failure of appetite, so that he takes a little milk often and never completely empties the breast.

Nursing where there is a minimum amount of distraction for the child: This factor is very important especially for the nervous type of infant and for all infants as they grow older. Distraction at the time of nursing tends to make a child cease before the meal is complete, resulting in failure to empty the breasts, and crying and restlessness before the next nursing time.

Position of the child when nursing: It is important that the child be held in such a manner that breathing is not interfered with.

3. Physical abnormalities in the child, either local or general:

Such conditions as adenoids, harelip, cleft palate, and disturbances of the central nervous system.

The remedy for these conditions is two-fold: The education of the mother in the care of her child, preferably during pregnancy or earlier, and the proper care of the mother during pregnancy and labor. Such care will eliminate in large part the premature and weak infant, and those physical abnormalities which are the result of injuries at birth.

Fortunately, however, though this is the ultimate solution of the problem, there are very satisfactory methods of emptying the breast on which a weak or physically defective child fails. This matter is especially important because the weak child needs, above all, breast milk, and his very condition tends to diminish not only the amount he takes but also the amount of milk available. A very valuable technique has been worked out. This consists in instructing the mother or nurse to express milk from the breast after each nursing by the following method:

Scrub the hands and nails with soap, warm water, and a nailbrush for at least one full minute. Wash the nipple with fresh absorbent cotton and boiled water or a freshly made boric solution. Dry the hands thoroughly on a clean towel and keep them dry. Have a sterilized graduate glass tumbler or large-mouthed bottle to receive the milk.

1. Grasp the breast gently but firmly between the thumb placed in front and the remainder of the fingers on the under surface of the breast. The thumb in front and the first finger beneath should rest just outside of the pigmented area of the breast.

2. With the thumb a downward pressing motion is made on the front against the fingers on the back of the breast, and the thumb in front and fingers behind are carried downward to the base of the nipple.

3. This second act should end with a slight forward pull with gentle pressure at the back of the nipple, which causes the milk to flow out.

The combination of these three movements may be described as "Back-down-out."

It is not necessary to touch the nipple.

This act can be repeated 30 to 60 times a minute after some practice.

Both breasts may be emptied if necessary, or they may be used alternately.

The milk should be covered at once by a sterile cloth held in place by a rubber band and kept on ice until used.

It is to be given to the baby at the end of the next nursing. By this method not only does the child get the nourishment which he needs, but the complete emptying of the breasts increases the supply of milk.

If at first sufficient milk is not available by suckling and expression, as determined by weighing the child before and after feeding, artificial food can be given temporarily after each nursing. Experience with many thousands of cases both in Minnesota and elsewhere has demonstrated the value of this method. It has been shown to be possible, too, by this means to reestablish the secretion of milk in the breast after as long as six weeks' inactivity. It is possible to express milk from the breasts by other methods, such as by massage or the breast pump, but the method described is probably the best way of stripping the breasts.

As far as the mother herself is concerned, though the demand of a strong suckling child or a substitute is the most important consideration in maintaining an adequate milk supply, there are many others to be taken into account in our modern life.

1. Adequate prenatal care and instruction for the mother.

(a) General:

Adequate nutritious diet, including a good supply of vitamins. This will not only maintain the nutrition of the mother, but is a potent factor in the development of a strong child.

Freedom from *overwork* either without or within the home.

Instruction during this period concerning the importance of breast feeding for the child and the means of procuring it.

Medical care, to prevent such conditions as eclampsia, which is likely to interdict breast feeding; to promote general hygiene and physical well-being, particularly to remove foci of infection, such as in teeth, which have been demonstrated to be factors in the unsatisfactory production of breast milk; to prepare for labor.

(b) Special:

Emphasis on care of the breasts to prepare them for lactation. Where the nipples are small, attempts to lengthen them may be made by slight traction and molding, night and morning.

2. Lying-in period.

Good obstetrical care will eliminate birth injuries in both mother and child, severe hemorrhage, and puerperal fever, conditions likely to inhibit breast feeding.

3. Postnatal period.

Sufficient rest, freedom from anxiety, good general hygiene with special emphasis on a nutritious diet are the factors likely to insure a good milk supply.

4. Lactation period.

Good mental and physical hygiene during the period of lactation with all that this implies. This means adequate but not *too much* food, and an abundance of fluids in the diet—at least two quarts. The diet should be a good, mixed, easily digested one, containing animal protein and foods rich in vitamins, notably milk, eggs, butter, and fresh vegetables.

Daily exercise, fresh air, and rest, but not indolence.

Freedom from worry and emotional excitement.

THE QUALITY OF BREAST MILK.

Chemical analysis was early resorted to as a means of determining the quality of breast milk. Wide and varied application of this method has shown that it has very marked limitations. It has been found that the composition of milk varies in the same woman from day to day, from nursing to nursing, and at different periods of the same nursing. Any analysis, therefore, to be valid, must be made on *all* the milk from the breast at a given time, or on samples taken at the beginning, middle, and end of nursing, and the same result must be obtained at least twice. It has also been found that the quality of milk can not be gauged by its analysis alone. There are marked variations in chemical composition, entirely compatible with growth and good digestion in the child; on the other hand a presumably normal chemical analysis may occur in a milk which is indigestible and does not provide adequate stimulus for growth.

The average composition of breast milk is generally given as follows:¹

Composition.	Normal average (mature milk).	Common healthy variations.
	<i>Per cent.</i>	<i>Per cent.</i>
Fat	3.50	3.00 to 5.00
Sugar	7.50	6.50 to 8.00
Protein	1.25	1.00 to 2.00
Ash20	.18 to .25
Water	87.55	89.32 to 84.75

In general, variations in quality determined by analysis fall into three types:

1. All elements too high.

This type is most frequently found in women who do too little and eat too much and too rich food.

2. Fat and sugar low, proteins high.

This type is usually found in women of the poorer classes who are overworked and underfed.

3. Fat and sugar very low, proteins very high.

This type is usually found in the highly strung, overeducated, and highly civilized women of the larger cities, but may be found in neurotic women of any class or community.

In recent years variations in the nutritional properties of human milk have been shown to be due also to its vitamine content. The vitamins of human milk are concentrated from the food taken by the mother; if they are not present in sufficient quantities in her food, the milk suffers. The effect of an insufficient amount or absence of these substances in the milk is exhibited in the child. Scurvy, for example, in the breast fed has been shown to develop because of the deficiency of the antiscorbutic factor in the mother's food. The development of rickets in the breast fed has also been shown to be due to a deficiency in the mother's diet, reflected in the quality of her milk.

DIFFICULTIES OF BREAST FEEDING.

Trouble with the breast itself may interfere with satisfactory breast feeding. The presence of depressed nipples is a distinct handicap; it may be remedied at times by the employment of a nipple shield. Cracks or fissures in the nipples sometimes occur. These render nursing very painful, and offer a convenient portal of entry for infection. They may usually be prevented by the proper care of the breasts during pregnancy, and during lactation by carefully

¹ Holt, *The Diseases of Infancy and Childhood*, p: 137. New York and London, 1919.

washing the nipples with fresh boric acid solution before and after each nursing. If fissures occur, compound tincture of benzoin should be applied to them, and a nipple shield should be used for nursing until the cracks heal. After nursing, the nipples should be washed and dried. The shield should be carefully cleaned and boiled before using. Mastitis, or infection of the breast, is another complication. This can be prevented usually by the methods just described for preventing and treating fissures. Its occurrence, however, is an indication for rest to the breast involved, by nursing the child at the other breast exclusively, emptying the infected breast, if it becomes distended, by means of expression or a breast pump, cold applications and incision when indicated. After the breast has healed the child should be nursed at it again.

A normal breast-fed baby gains steadily from 4 to 8 ounces a week, presents no symptoms of indigestion in the form of vomiting or diarrhea, and has as a rule from 2 to 4 soft yellow movements a day. There are, however, many deviations from such a course. The baby may be constipated or its stools may be too frequent and green; it may fail to increase in weight normally. Such symptoms are frequently interpreted by the mother and often by the physician to indicate unsuccessful breast feeding and the necessity for resorting to artificial feeding. This conclusion is drawn from false premise, for symptoms which would be alarming in an artificially fed baby may be viewed with equanimity in the breast fed, so great is the factor of safety in mother's milk. Under such circumstances a careful study of both mother and child, and, if indicated, of the milk, will reveal causes which may be remedied. Overwork and underfeeding, underwork and overfeeding, sometimes the absorption of poisons from foci of infection and worry on the part of the mother, may change the quality of the milk so that it will produce one or another type of symptom in the child. The discovery of the cause and its removal will often yield fruitful results.

A study of the child as well as of the mother may point the way to the difficulty. Is his failure to gain due to the fact that he is not getting all of the available milk, or to the fact that the milk is "weak"? Is he vomiting because he overflows from too full a stomach or is the milk too rich or is there an obstruction of some kind? Are his frequent stools the effect of an overrich milk on a sensitive intestine; are they the expression of some excitement on the part of the mother or the baby; or are they "starvation stools"? Is his constipation a reflection of the same condition in the mother; are his own intestinal and abdominal muscles flabby; is the volume of his food too small for the intestines to contract on satisfactorily; or is there spasm of the anal sphincter? From a consideration of the factors influencing the quality of milk it is obvious that the problem

is social and economic as well as medical, and that for its understanding and solution all these forces in the community must work together, just as they must cooperate to prevent the occurrence of the difficult case of breast feeding.

FACTORS TO BE CONSIDERED IN PROMOTING MATERNAL NURSING.

1. Educational.

Mothers:

All mothers should be instructed during pregnancy and after the baby comes by means of literature, public health nurses, and consultations. They should be instructed among other things in the importance of breast feeding and in the means of promoting it, in which matters the prenatal nurse can be of great assistance.

Community:

The community in general should be interested through lectures, newspaper propoganda, etc., in the fundamental necessity of this phase of child welfare, so that—

- (a) It will be possible for every mother who is able to do so to nurse her child.
- (b) There will be provision by the establishment of properly supervised wet-nurse directories and institutions for collecting and distributing bottled breast milk for the child who needs breast milk and can not get it from its mother.

2. Economic and social.

Adequate income for the nursing mother and her family:

To provide adequate nourishment for the mother.

To eliminate the necessity for outside industrial work.

To provide for home help when necessary.

To eliminate strain and worry attached to inadequate living conditions.

Aid in the adjustment of individual problems.

3. Medical.

High standards of care during pregnancy, labor, puerperium, and period of lactation.

Careful study of both mother and child to discover and remedy any causes of difficulty in breast feeding.



