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Artificial Feeding

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Artificial Feeding

ELIZABETH OLDHAM

NUTRITION is the most important factor in the rearing of infants. The largest part of the immense mortality of the first year of life is traced directly to lack of knowledge of certain physiological laws regarding the requirements of the growing organism. The elements of food needed in infancy and childhood are the same as those in adult life except that the quantities are vastly different.

The aims in feeding a normal baby are to secure a normal development of the infant and a progressive gain in weight, to develop the infant's digestive system and to keep him free from indigestion.

Infants have individual characteristics which have to be considered. Thus the pediatricians of today are using quite varied formulae in infant feeding, many of them very different in nature from those employed a few years ago. Yet each has the ultimate purpose of securing a normal development and a healthy child.

Joseph Garland, of the Boston Medical School, advocates the universal use of cod liver oil in this climate and under present conditions of life. It is valuable because of its vitamin A content and can be given in small amounts. As a preventive and cure for rickets it is second only to the direct rays of the sun or ultra violet radiation. These precautions against rickets must be taken especially in the case of prematurely born infants. Calcium and phosphorus are stored late in pregnancy and children born prematurely are deprived of a considerable amount, which must be supplied. The amount of milk which passes daily thru a premature infant from the mother's milk corresponds to the amount needed for its maintenance. Anaemia is a disease found commonly in premature infants, twins or infants of anaemic mothers. Normal infants are born with a reserve supply of iron stored in the liver—which is drawn upon to supplement the iron in food. This supply is gradually diminished and reaches the lowest point just before the time the animal is ready to take solid food. This store of iron is also made during the last months of pregnancy. Where this store is deficient it is necessary to add iron to the food. It has been the practice for the last few years of many pediatricians to begin a mixed diet of cereal, fruit juice, egg and vegetables at a very early age, often the fifth or sixth month. Finely strained spinach is less likely to upset the infant's digestion than vegetables which contain more starch, such as carrots and peas. Hess gives beef juice as it contains a moderate amount of pigment and iron, as it is well utilized by the organism. Infants with insufficient iron in the system may be given soft boiled egg yolk mixed with milk or saccharated oxide of iron or spinach water as early as one month of age. Saccharated oxide of iron is best given in powdered form, a pinch three times a day mixed with milk or orange juice.

Egg yolk contains the largest amount of iron and is considered best by Hill as it contains pigment in large quantity. It is anti-rachitic, easy to digest and has a not inconsiderable caloric value. To vary

the diet other foods, rich in iron, can be used, but a little spinach goes a long way. A baby 9 to 12 months old should not have more than one tablespoonful daily.

Recent clinical results of Hess and Matzner with mixtures of milk, lemon juice, sucrose and egg yolk were satisfactory, as the infants tolerated this mixture quite well, gained in weight and the muscles showed firmness. There were no manifestations of indigestion or of protein sensitization. Babies as young as three months were fed this mixture in the ratio of two-thirds milk to one-third egg yolk, vinegar and sucrose. The advantage of this simple formula is that it supplies both the antineuritic and antiscorbutic factors. More lemon juice can be added without causing digestive disturbances. It provides the additional fat soluble vitamin and iron. Lemon, orange or tomato juices can be added directly without producing curdling. Tomato juice is an excellent antiscorbutic food well adapted to infant feeding. By mixing 21 c.c. of lemon juice with 1 quart of milk, its buffer action is reduced and hydrogen iron concentration is increased. In this way the cow's milk is rendered more digestible and made to more nearly resemble human milk. The advantage of using lemon juice is the addition of the antiscorbutic factor. Egg yolk combined with lemon juice provides a food which compensates for the nutritional deficiencies of cow's milk and furnishes also antiscorbutic, anti-neuritic, fat soluble vitamins and iron.

Acid milk straightens out gastrointestinal disturbances quickly. In well babies the change in formulas was infrequent. One mixture generally sufficed from four to six weeks before another raise from two to four ounces of vinegar milk was necessary. Vinegar milk compares favorably in such factors as economy, common usage, wise distribution and safety. One ounce of vinegar to fifteen ounces of cow's milk was given undiluted to children over two months; for children under two months it was diluted in oatmeal gruel.

Pediatricians who have watched babies thrive on cereal gruel agree when they say that one is struck with the vigor, sturdiness, turgor, well developed muscles, pinkish glow of the skin and rapid gain in weight. The cereal gruel and paste are foods of choice in many difficult feeding cases as it can be used for the sick and the well baby. They are economical and easily prepared. With additions of cod liver oil and orange juice such as would be used with any food for an artificially fed baby, they produce a condition of nutrition in many respects comparable to that in a properly breast fed baby.

For severe cases of malnutrition some specialists are advocating the use of corn syrup in combination with lactic acid milk. Marriatt's formula is 45 volumes of commercial corn syrup with 55 volumes of water.

Bee's honey, is one of the oldest and most widely distributed foods and has been used as a medicine from time immemorial. Honey favors absorption of fat

by yielding acids to be absorbed as such. Another advantage in using honey is its protein content, mainly derived from the pollen of the plants. It not only adds to the nutritive value, but in cases where the infant cannot digest casein or other milk protein it may become the only available source of nitrogenous food during a critical period. It is capable of sustaining life and building tissue. Honey contains only small amounts of mineral salts, but they are of great value to infants. This is especially true of the iron, of which human and cow's milk contain so little. Organic acids act as mild stimulants to the digestion and the increase in appetite seen in children fed on honey may be largely ascribed to this factor and possibly to the volatile oils. Children fed on pure honey can easily dispense with orange juice. Fresh honey has a decided laxative action, which it loses upon boiling. Fresh honey has a soothing effect upon infants. Fretful babies exhibit a remarkable change of temper after being put on honey. The tendency to fall asleep after feeding honey was noticeable. It can be successfully substituted for orange juice and cod liver oil. Honey is abundantly provided with the three accessory food factors which have such a predominant influence upon animal metabolism. Luttinger found all three vitamins in 82% of the honeys examined, which induced him to discard all other sugars in infant feeding. One teaspoon of honey to eight ounces of barley water is given for summer diarrhea. Its rapid absorption prevents it from undergoing alcoholic fermentation and infants fed on honey rarely show signs of flatulence. One tablespoon of honey contains 100 calories and yields 1520 calories per pound.

Luttinger now uses honey as a routine component of all formulas for substitute infant feeding. Wherever there is an indication for sugar, lactose or maltose, he invariably substituted honey and the results from 419 cases encouraged him to use and plead for the use of honey in infant feeding.

Experiments were tried to find the antiscorbutic capacity of different foods. Milk boiled ten minutes does not produce scorbutic infants. Year old unsweetened condensed milk sterilized at a high temperature produces scorbutics. Aging after sterilization clearly destroys the vitamins. Over 50 percent of infant scurvy is caused by milk rendered homogenous. Animals fed powdered milk die of scurvy in the same time as those fed sterilized milk. Orange, tomato and lemon juice should be given the artificially fed baby. These juices should be fresh because when left standing several days they will lose part of their antiscorbutic properties. Dry milk has been advocated for use when traveling, as it is sterile and keeps indefinitely. If flours are to be used, potato flour is advised. The starch should be converted to dextrin by roasting. The vitamin content is low and suffers from drying and roasting, but is better than other flours. No digestive disturbances are caused. It is slightly laxative, which may be an advantage.

The theory that the formula of a baby's

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An Iowa Home

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lege to select from Iowa canned corn, tomatoes, spinach, peas, sauer kraut, catsup, sweet pickles, pumpkin, squash, beets, beans and milk. She may purchase Iowa made crackers, bread, spaghetti, macaroni, cookies, cakes and pies. "Junior", if so permitted, has his choice of candies, ice cream, beverages and even mineral waters, all of which are manufactured in this state.

The Iowa household is kept clean by the many soaps made in Burlington, Dubuque, Sioux City and Des Moines. The laundry, once the housewife's weekly drudgery, is now easily done with the assistance of a washing machine and ironer manufactured in Newton, Grinnell, Perry or Davenport.

Mother buys buttons made from clam shells in Muscatine and our overalls, work shirts, cotton gloves and mittens all come from some of the largest factories in the world located in this state. In business and at home we find use for a Sheaffer pen or pencil from Fort Madison or a "Jiffy" manufactured in Sioux City. The day and date of the month will be remembered by reference to the calendar manufactured in the largest printing house of its kind, located in Red Oak.

For the family recreation the Brunswick phonograph may be bought directly from the mill in Dubuque and the piano may be bought from the factory at Bellevue. Among our magazines and papers will be those published in Iowa, for Des Moines alone is one of the largest printing centers in the world.

The house has been built and our family is living in it. Iowa has contributed well toward its maintenance and happiness.

Artificial Feeding

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food should bear a close analogy to that of human milk fails in many cases in practical applications. After experience in percentage feeding of infants in a London hospital, Burgess (1925) decided that there was something more in human milk than is expressed in its percentage formula and caloric value. That until a fat is found that can be tolerated by the infant we are doing incalculable harm to the infant population by insisting on strict adherence to percentage feeding. In some cases after a few days breast feeding fat was borne where before it couldn't be tolerated.

Investigators abroad are firmly convinced that the premature as well as the new born infant will thrive much better on more concentrated milk mixtures. Vomiting is less frequent than with more dilute mixture. In cases of severe vomiting, whole milk not diluted is recommended owing to the fact that quantity can be lessened. For children with poor appetites it is of great advantage inasmuch as the quantity can be materially lessened.

Thus it is evident that the many experiments are being carried on at the present time on infant feeding and as no one method or plan has been adopted by all specialists, no definite conclusions can be drawn as to which is the better of the numerous methods in use.

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