**Feeding in the first year of infancy / by Joseph E. Winters.**

# FEEDING
# IN THE FIRST YEAR OF INFANCY.

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## Feeding Formulas.

An experienced practical worker in pediatrics never encounters a difficulty in infant-feeding that is not surmountable. Apparent insurmountables constantly confront the general practitioner, for the reason that feeding in early infancy has been medleyized by investigation reports, the mathematician, and the speculatist.

Investigation reports usually prove alluring to the practitioner. In practice they constantly discredit him.

A scientific luminary would allow fecal discharges, not composition of food, to determine the mode of feeding.

The presence or absence of starch in fæces which have sojourned an uncertain period in the midst of fermenting, decomposing material has no more bearing on infant-feeding than the presence or absence of gold in seawater.

It behooves the bedside physician to examine broadly, deeply, critically, analytically, a propounded anomaly in medical practice before its adoption in experimentation on his patient.

What is prerequisite in a food for a newborn child, just separated from its mother's bloodstream?

It must supply heat, maintain respiration and nervous energy, and furnish constituents for growth—building material.

Over the whole round world it is universally conceded that the ideal food for these grand purposes contains 4 to 6 per cent. fat, 7 per cent. milk sugar, 1 per cent. proteid, minerals in *organic union* with proteid—the milk of a healthy woman.

With these constituents in these proportions we see the perfect child.

If there is paucity of these constituents the food is inferior.

The trend to cereal and fat curtailment is erratic, unphysiological, unscientific, weighted with disease and death.

**Composition of Barley Flour**

Fat 0.97.

**Composition of Barley Water**

Fat 0.02.

Fatal paucity of prerequisites.

Barley is characterized by destitution of constituents for heat, respiration, and nervous energy. Conception of it for these sublime purposes is eminent of puerility.

Unsuccessful modifiers embrace it as a shield. Perforce a coterie of vociferous heralds.

The net result is that young infants are daily presented at the dispensaries with deeply sunken intercostal spaces, protuberant bones; the subcutaneous fat deposited in intra-uterine life teetotally burned in maintenance of heat, respiration, and nervous energy.

Ignominious exemplification of *theory in practice.*

Acquiescence in its use is most preposterous, most deplorable.

Where mother's milk is seriously defective in fat, the fontanelle is greatly depressed; every mark of the profound innutrition is identical with what is witnessed where the food has been a fat-free cereal.

This parallel should demonstrate to the most puerile the sinfulness of the cereal fad, *and of the propagation of low fat.*

That the abundant fat in a *superior* quality of woman's milk is physiological, and prerequisite, is further emphasized—made unequivocal, inconfutable, unanswerable—by the presence in the brain of 8 per cent. fat, in the nerves 22 per cent., both of which are developing with great rapidity; in the marrow of bone, where the red blood cells are chiefly formed, 96 per cent. fat.

The waxy pallor, the ominous blue vessels; the unceasing restlessness in one, and the imperturbable listlessness in another, are adequately explained by the denutrition of bone marrow and of nerve.

*In a breast-fed child nutritive vigor is proportionate to the fat.*

A robust mother of eighteen had a child of unusual development. Her breast milk contained 5.84 per cent. fat. A vigorous wet-nurse of nineteen years with a nursling of remarkable growth had 5.76 per cent. fat.

The strippings are 1.50 to 2 per cent. higher in fat than the fore-milk.

A breast-fed child whose nutrition and development would be considered perfect probably receives from 6 to 7.50 per cent. fat.*

A *superior* quality of woman's milk must be the standard for a substitute.

* Reports of diarrhœa the effect of excess of fat in mother's milk, and of convulsions from high fat feeding, are merely examples of superficial and superlatively crude diagnoses.

To deduce as standard the *average* of one hundred analyses, from 1.30 to 7.61 per cent. fat, is an absurd fallacy.

To mix good and poor, and call it *best,* is derisive mockery of Nature. There would be as much logic in selecting an average or medium wet-nurse instead of the best.

Nature's food when at her *best;* the vital functions of heat, respiration, and nervous energy; the composition of the blood-forming, heat- and force-producing structures, are not alone unmistakable physiological indications, but are mandatory of abundant fat for a young child.

Clinical results in more than one thousand cases of artificial feeding are conclusively confirmatory.

The scientific basis of abundant fat is unimpeachable. Traditional consensus of opinion has no weight. The one invulnerable, unassailable criterion is the baby.

Results, not theories, fix the standard.

## "Fat Indigestion."

Engendered by centrifugal cream, theorists educed a dogma. Centrifugal cream is conglomerate fat. It is as impossible as cheese. It cannot make the passage of the pylorus—never reaches the secretions for fat digestion. It is proteid-free. Vitality languishes. Eradicate by eliminating separator cream, and the milk of Jersey and Guernsey cows.

Milk of average grade should be used.

## Proteid.

Proteid is the growth-constituent. Woman's and cow's milk contain two proteids—albumin and casein.

Albumin is not coagulated in the stomach.

Casein is coagulated into tough, leathery masses.

The non-coagulated, non-coagulable albumin readily passes through the small, narrow pylorus to the intestine, where absorption is immediate.*

Casein masses cannot make the passage of the pylorus.

## Colostrum Paramount.

The first and second days after childbirth the secretion of the breasts contain 8.6 per cent. *albumin;* from the third to the seventh day 3.4 per cent., from the eighth to the fourteenth day 2.5 per cent.

Contemplate Nature, wise, and wondrous, and practical.

A child increases in length most rapidly the first week of life. Nature's bounteous growth-constituent is a physiological necessity.

The appalling mortality in children artificially fed occurs chiefly in first weeks.

Mortality in second month is only a small fraction of that in first month.

Ample heat- and growth-constituents in first weeks would efface the black mortality column of artificial feeding.

High proteid, non-coagulable, absorbable without digestive effort, is impossible of duplication.

To eliminate a discrediting mortality peak, the inimitable secretion of a fortnight must be utilized. THIS IS FEASIBLE.

Water forestalls lactation!

Never give water from a bottle to a newborn child. Refusal to nurse is certain to ensue.

* The infant pylorus is so narrow that it admits only the passage of a small probe and is surrounded by a protuberant, firm, muscular ring—ERRONEOUSLY DENOMINATED PYLORIC STENOSIS.

As soon as the mother has received proper attention put the child to the breast. A child should nurse every three hours the first day, every two hours the second—ten times in twenty-four hours.

Water may be given from a spoon twice the first day; It is not necessary the second day. Water must not be given after the secretion is established.

Much water, even from a spoon, prevents vigorous nursing. Vigorous nursing stimulates secretion.

Refusal to nurse, and non-secretion, are inevitable evil fruits of water.

Unnecessary weaning has become well-nigh universal through this error.

With strict observance of these precautions every mother can nurse during the indispensable colostrum period.

**Woman's and cow's milk can be made practically identical after the second week.**

The third week of lactation albumin decreases, casein increases. *After the fifteenth day there is no irremediable difference between woman's and cow's milk.*

Alleged inscrutable differences are pure hypothesis, and emanate from those handicapped by lack of ability to modify to meet the individual indication.

The substitute must be identical in composition with a *superior* quality of woman's milk, and *must present the same physical behavior.*

*Utilization of proteid is dependent upon its physical behavior.*

**Physical Behavior of Proteid of Upper Half-Ounce from a Quart Bottle of Milk.**

The milk must have been put in the regulation quart glass milk jars of commerce immediately after milking, and must have been kept standing upright on ice for at least sixteen hours before removing the *top half*-ounce. The *top half-ounce* should be removed from four such quart bottles of milk, giving a composite sample. This cream when diluted with water as for feeding, and acidulated at about 98½° to 100° F., yields an immense number of finely divided, light, feathery flocks, which float in the solution, and are easily reduced to a semi-emulsified condition by stirring.

*Deeper layers yield larger and tough curds, which on stirring stick together and sink.*

Physical behavior of proteid which enables it to make the passage of the pylorus is fundamental to success.

Available, and ample, and utilizable growth-constituent is in *top half-ounce of gravity cream only.*

Individualization is the corner-stone of successful feeding. Elaboration of fundamental principles does not preclude this. There must be moderate flexibility for the idiosyncratic. Two basic principles are inviolable—abundant fat, flocculent feathery proteid.

There are formulas for cases in which there is no alternative but artificial feeding from birth.

Every breast-fed child should have at least one bottle from the third week, and two bottles after the first month. This allows the mother needed, uninterrupted rest at night, and desirable freedom in the day; makes weaning easy at any period, and accustoms the digestion to an artificial food—an essential consideration.

The first bottle of any period of lactation should be of Formula No. 1.

# FORMULÆ FOR FEEDING.

## Formula No. 1.

*Upper ½ ounce from each of two quart bottles of milk.**

1st, 2d, and 3d days:
Milk sugar, 6 teaspoons level full.
Cold unboiled filtered water, 4 ounces.
Lime water, 1 ounce.
Ten bottles. Feed every two hours.

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## Formula No. 2.

*Upper ½ ounce from each of three quart bottles of milk.*

4th, 5th, 6th, and 7th days:
Milk sugar, 6 teaspoons level full.
Cold unboiled filtered water, 6½ ounces.
Lime water, 2 ounces.
Ten bottles of one ounce. Feed every two hours.

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## Formula No. 3.

*Upper 1 ounce from each of three quart bottles of milk.*
(Use 2½ of the 3 ounces in preparing food.)

Second week:
Milk sugar, 6 teaspoons level full.
Cold unboiled filtered water, 10 ounces.
Lime water, 2½ ounces.
Ten bottles of 1½ ounces. Feed every two hours.
Many do no take entire quantity; do not urge.
One and sometimes two bottles may be omitted at night.

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* The milk must have been put in the regulation quart glass milk jars of commerce immediately after milking, and must have been kept standing upright on ice at least sixteen hours from the time of milking. In Metropolitan centres the quart bottles of milk must have been kept standing upright on ice at least six hours after they are received in the nursery before removing the top ½ ounce of cream. The *top ½ ounce* can only be secured with the *keel*-shaped half-ounce dipper of the Noel Nursery Table. A *flat*-bottom dipper defeats the purpose of a cream dipper, *i.e.*, feathery proteid flocks.

Dissolve the milk sugar in the cold water; mix the sugar solution and the cream thoroughly together, and *then* add the lime water.

Lime water is added in furtherance of emulsification. As an ally to the motor function of the stomach in its passage of proteid through the constricted pylorus, lime water cannot be substituted for. Magnesia and soda for this facility are profitless.

As to rendering food alkaline or amphoteric it is empty talk.

Keep the feeding bottles in the refrigerator until used. At the time of feeding, heat the food to a temperature of 98½° to 100° F.

## Formula No. 4.

*Upper 1½ ounces from each of three quart bottles of milk.*
(Use 4 of the 4½ ounces in preparing food.)

Third week: Milk sugar, 6 teaspoons level full.
Cold unboiled filtered water, 12 ounces.
Lime water, 4 ounces.
Eight bottles of 2 ounces. Feed every 2½ hours.
Some children require 2½ ounces; therefore the formula for 20 ounces.

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## Formula No. 5.

*Upper 2 ounces from each of three quart bottles of milk.*
(Use 5 of the 6 ounces in preparing food.)

Fourth week: Milk sugar, 6 teaspoons level full.
Cold unboiled filtered water, 11 ounces.
Lime water, 4 ounces.
Eight bottles of 2½ ounces. Feed every 2½ hours.

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## Formula No. 6.

*Upper 2½ ounces from each of three quart bottles of milk.*
(Use 6½ of the 7½ ounces in preparing food.)

Fifth week: Milk sugar, 6 teaspoons level full.
Cold unboiled filtered water, 13½ ounces.
Lime water, 4 ounces.
Eight bottles of 3 ounces. Feed every 2½ hours.

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## Formula No. 7.

*Upper 2½ ounces from each of three quart bottles of milk.*
(Use 7 of the 7½ ounces in preparing food.)

Sixth week: Milk sugar, 6 teaspoons level full.
Cold unboiled filtered water, 13 ounces.
Lime water, 4 ounces.
Eight bottles of 3 ounces. Feed every 2½ hours.

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## Formula No. 8.

*Upper 2½ ounces from each of three quart bottles of milk.*

Seventh week: Milk sugar, 6 teaspoons level full.
Cold unboiled filtered water, 12½ ounces.
Lime water, 4 ounces.
Eight bottles of 3 ounces. Feed every 2½ hours.
When movements are loose or green double the lime water.

## Formula No. 9.

*Upper 3 ounces from each of three quart bottles of milk.*
(Use 8 of the 9 ounces in preparing food.)

Eighth week: Milk sugar, 6 teaspoons level full.
Cold unboiled filtered water, 12 ounces.
Lime water, 4 ounces.
Eight bottles of 3 ounces. Feed every 2½ hours.

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## Formula No. 10.

*Upper 4 ounces from each of two quart bottles of milk.*

Ninth and tenth weeks: Milk sugar, 6 teaspoons level full.
Cold unboiled filtered water, 12 ounces.
Lime water, 4 ounces.
Eight bottles of 3 ounces. Feed every 2½ hours.

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## Formula No. 11.

*Upper 5½ ounces from each of two quart bottles of milk.*

Eleventh and twelfth weeks: Milk sugar, 6 teaspoons level full.
Cold unboiled filtered water, 13 ounces.
Lime water, 4 ounces.
Seven bottles of 4 ounces. Feed every three hours.

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## Formula No. 12.

*Upper 6½ ounces from each of two quart bottles of milk.*

Thirteenth week: Milk sugar, 6 teaspoons level full.
Cold unboiled filtered water, 11 ounces.
Lime water, 4 ounces.
Seven bottles of 4 ounces. Feed every three hours.

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## Formula No. 13.

*Upper 7½ ounces from each of two quart bottles of milk.*

Fourth month: Milk sugar, 6 teaspoons level full.
Cold unboiled filtered water, 9 ounces.
Lime water, 4 ounces.
Seven bottles of 4 ounces. Feed every three hours.

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## Formula No. 14.

*Upper 8 ounces from each of two quart bottles of milk.*

Fifth month: Milk sugar, 6 teaspoons level full.
Cold unboiled filtered water, 12 ounces.
Lime water, 4 ounces.
Seven bottles of 4½ ounces. Feed every three hours.

### Formula No. 15.

*Upper* 9 *ounces from each of two quart bottles of milk.*

Sixth month: Milk sugar, 6 teaspoons level full.
Cold unboiled filtered water, 11 ounces.
Lime water, 4 ounces.
Six bottles of 5½ ounces. Feed every 3½ hours.

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### Cereal.

Apprised by physiology of the appropriateness of cereal, milk is supplemented by this during the sixth, or at the beginning of the seventh month.

To give farinaceous food before the sixth month is to gainsay the correctness of the very foundation of our science. A scientific physician follows Nature—never contravenes physiology.

In summer, barley or granum; in autumn and winter, oatmeal. It must not be added to the bottle until immediately before feeding, as cereal and milk mixed and allowed to stand undergo fermentation—a noxious pudding. One-half ounce of barley or granum, or one teaspoonful of oatmeal jelly, to each bottle. The oatmeal must be strained.

### Formula No. 16.

*Upper* 11 *ounces from each of two quart bottles of milk.*

Seventh month: Milk sugar, 6 teaspoons level full.
Cold unboiled filtered water, 9 ounces.
Lime water, 4 ounces.
Five bottles of 7 ounces. Feed every four hours. (Many do not take all; do not urge.)

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### Formula No. 17.

*Upper* 13 *ounces from each of two quart bottles of milk.*

Eighth and ninth months: Milk sugar, 5 teaspoons level full.
Cold unboiled filtered water, 10 ounces.
Lime water, 4 ounces.
Five bottles of 8 ounces. Feed every four hours.
Add one ounce of barley or granum, or two teaspoonfuls of strained oatmeal jelly, to each bottle.

## Formula No. 18.

*Upper* 15 *ounces from each of two quart bottles of milk in summer; upper* 18 *ounces in winter.*

(In summer.)

*Upper* 15 *ounces from each of two quart bottles of milk.*

10th to 11th month (in summer).

Milk sugar, 4 teaspoons level full.
Cold unboiled filtered water, 16 ounces.
Lime water, 4 ounces.

Five bottles of 10 ounces. Feed every four hours.

(In winter.)

*Upper* 18 *ounces from each of two quart bottles of milk.*

10th to 11th month (in winter):

Milk sugar, 4 teaspoons level full.
Cold unboiled filtered water, 10 ounces.
Lime water, 4 ounces.

Five bottles of 10 ounces. Feed every four hours.

Add two ounces of barley or granum, or one tablespoonful of strained oatmeal jelly, to each bottle.

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## Formula No. 19.

*Upper* 21 *ounces from each of two quart bottles of milk.*

12th month:

Milk sugar, 4 teaspoons level full.
Cold unboiled filtered water, 4 ounces.
Lime water, 4 ounces.

Five bottles of 10 ounces. Feed every four hours.

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## Vomiting in Infants.

CAUSES: Casein masses which cannot make the passage of the pylorus. Too frequent feeding; over-feeding—excess in quantity (see formulas).

The stomach is chiefly a motor organ. It does not absorb water. There is the same muscular contraction for water as for food to force it into the intestine for absorption. Frequent contraction causes atony. Impaired mechanical power cannot cope with a narrow

pylorus. Giving water between feedings is a prolific source of vomiting.

Distension and pressure by flatulency, which is often due to emptiness from a weak, watery food.

Unphysiological feeding—cereal before the sixth month.

Hunger is not an uncommon cause.

Tight bands, constricting and interfering with free abdominal and thoracic movement. Malposition; a cramped, distorted position of a young child will cause the stomach to eject its contents. In a recent case this was pointed out to the nurse as the cause. The nurse failed to relieve. With another nurse vomiting ceased at once and has not recurred.

Fast nipple, too free flow and choking. Too small opening in nipple, child becomes tired out and retches, or becomes irritated and annoyed, which ends in vomiting. Handling, playing with, or merely talking to after feeding. Changing a napkin after feeding.

The pernicious practice of stomach-washing and of repeated intestinal irrigation; the recourse to enemas where food should correct bowel action, set up irritability of the stomach and *pyloric spasm*, and as an epiphenomenon, nervous susceptibility, which only the most conservative, gentlest management can allay. As a result of a misconception, pyloric spasm is designated pyloric stenosis.

### Management.

Food: When acidulated at about 98½° to 100° F., the proteid constituent must form light, feathery flocks, which readily emulsify on stirring.

A nurse whose necessary handling does not induce, but ameliorates, nervous susceptibility. No handling

or moving except to change diaper. This to be done before feeding—never after. No bathing. Clothing not to be changed except when very necessary. Feed in crib to obviate changing position after feeding, or if fed on lap to remain there until next feeding is due. Absolute seclusion in a quiet, moderately darkened room. Nurse to occupy an adjacent room.

Restlessness and nervous irritability in exceptional instances make demand for bromide. 5 or 10 grs., according to age, of bromide of potassium in one teaspoonful of water, given by rectum once in four or six hours according to necessity, will allay nervous irritability and vomiting.

A large nipple may titillate the palate and cause nausea and retching—use a two-ounce bottle with a small neck and a nipple not larger than a medicine dropper. It may even be necessary to feed with a dropper. Feeding with a spoon or with a dropper allays vomiting which sucking induces.

Cold milk may agree when hot (98½° to 100°) does not. This is a matter of the palate. Never give water to a very young infant between feedings.

A thoughtful, observant, gentle nurse, guided by a practical physician brings the case to a successful issue.

*Suitable attention to physical behavior of proteid, with management adapted to individual attributes, would eliminate gastroenterostomy—a mere subterfuge in feeding faults.*

## Refusal of Food.

A bottle-fed child must never be given water from a bottle. Refusal of food ultimately ensues. When water is required, it should be given from a spoon. A nipple with a hole so small as to necessitate strong

suction, may end in refusal to draw the bottle. This was explained to a mother and nurse, and assurance was given that this condition did not obtain. The child continued to take but one or two ounces. A trained nurse put in charge, at once discovered this to be the fault. This corrected, the child took eagerly the entire feeding.

A smeary, water-soaked gum nipple may create distaste for and refusal of food. After the nipples are sterilized by boiling, they should be dried and wrapped in sterilized gauze—never in cotton. A thread of cotton adhering to a nipple, by titillation may cause refusal to nurse.

Absolute quiet should be maintained during feeding. Conversation, playing of children, talking to, or anything that diverts, will stop some children in the middle of a feeding and often they will not take the bottle again.

### Pasteurization.

Animals in whom milk is a sufficient food, die of inanition when fed on milk in which the chemical union of proteid and mineral is broken up.

These constituents cannot form tissue, they cannot maintain life, when not in organic union.

The organic union of proteid and mineral in milk is light and easily dissolved. Pasteurization dissolves or loosens this chemical union. Milk in which the chemical union of proteid and mineral has been dissolved does not sustain life; milk in which this chemical integrity is impaired only half sustains life. The half-starved, rachitic, mournful little old men and women, fed on pasteurized milk from public milk stations, are sad examples of this. Numerous obscure, unanalyzable, undefinable, unrecognizable morbid states are encountered in the wake of pasteurized milk, which are the

aggregate expression of the individual cells—a general disease of every part. Prolonged use of pasteurized milk is always injurious.

## Infant Foods.

Of one thousand children fed on various infant foods, 430 *more* die in the first year of life than of one thousand milk-fed children. Of those who survive, 400 will be in bad or indifferent health.

Of those who live to the adult period, almost none are able for military service. The diminutive chest, the narrow contracted cranium, ultimate irreparable stigmata of vicious feeding, adequately explain the low status of usefulness.

Perfect feeding has as its greatest, grandest eventuality, the maximum of lung (engine) power and of nerve (brain) force.

There are more boys than girls born into the world. In consequence of the much higher death-rate in boys, there are more women than men.

These facts are of national importance. They justify a physician in declining to participate in the feeding of a child where a mother, through specious, colorable advertisements, insists on the use of any proprietary infant food.

A child fed on any one of the so-called infant foods, in a battle with acute disease, almost invariably succumbs.

These foods are all advertised as substitutes for milk. Milk is secreted from the blood, and is closely allied to it in composition. A substitute is as impossible as artificial blood.

Every proffered substitute for milk there is, has been, or will be, is baneful before the sixth month.

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