Mrs. M. G. Yocum,

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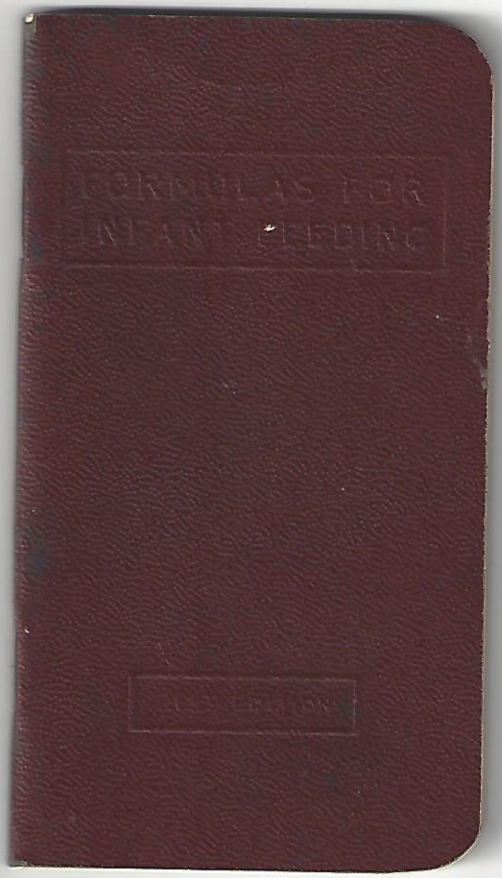

Miss
Ruby, E. Modesh
Etna Green,
Indiana.
R. R. #2.

MELLIN'S FOOD is a pure product of definite composition made especially for the purpose of modifying milk to meet the nutritive needs of infants deprived of human milk, and no matter what kind of milk is employed in preparing an infant's diet — certified, pasteurized, dried or evaporated — its digestibility and its value as nourishment for the baby is enhanced by the addition of Mellin's Food. In other words, any form of milk is better borne, is more completely utilized and its nutritive elements are more appropriately balanced if properly modified with Mellin's Food.

This is the 21st Edition
of
Formulas for Infant Feeding.

The first edition appeared in 1897.

Formulas
for
Infant Feeding
based upon
The
Mellin's Food Method
of
Milk Modification

PHYSICIANS MAY OBTAIN COPIES OF THIS BOOK AT ANY TIME, UPON REQUEST

Mellin's Food Company
Boston, Mass.

PRINTED IN U. S. A.

Mellin's Food is a soluble, easily digestible, dry extract, made from wheat flour, wheat bran, malted barley and bicarbonate of potassium. During the process of manufacture all of the starch in each of the cereals is transformed by the natural enzyme—malt diastase—into the soluble carbohydrates, maltose and dextrins. The proteins of the wheat flour, wheat bran and malted barley, as well as the salts that form a part of the content of these grains, are retained and the bicarbonate of potassium is added. By further manipulation and subsequent evaporation the whole is reduced to a dry powder which consists of maltose, dextrins, proteins and salts in definite proportions, as given in the analysis on page 74.

Mellin's Food is offered to the medical profession as a modifier of milk for the feeding of infants deprived of their natural nourishment, and its use as a milk modifier is consistent with the evidence

accumulated since the beginning of the study of the science of infant feeding.

No argument should be necessary to support the statement that cow's milk forms the true foundation of artificial feeding, nor should it be necessary to state that cow's milk must be modified in order to furnish a diet answering chemically and physiologically to the needs of an infant, for scientists who have made a study of infant nutrition and physicians who have had practical experience in the field of infant feeding unanimously concur in these views.

Mellin's Food fills a very important place in the modification of milk, for it not only materially assists in the digestion of cow's milk, but adds certain elements that favor a better balanced diet, resulting in a modification more in keeping with the actual nutritive requirements of the infant.

When Mellin's Food is used as the modifier, protein digestion

proceeds with less interruption for, as the casein portion of the milk protein is coagulated, which is the beginning of the process of the digestion of milk, a part of the Mellin's Food is occluded in the casein coagulum, thus changing the physical condition of the casein of the milk, making the curd soft, flocculent and sponge-like, easily permeated by the digestive juices and incapable of forming in tough, tenacious masses.

Mellin's Food also furnishes carbohydrates, an extra supply of which are always needed, for this food element is already deficient in cow's milk and made more so by necessary dilution. The carbohydrates in Mellin's Food are maltose and dextrins in a proportion well adapted to the needs of the sick infant as well as the normal baby.

Mellin's Food adds to cow's milk an amount of potassium calculated to supply the deficiency of this salt in diluted cow's milk, together with phosphatic salts and

iron; all very necessary for a well-balanced diet.

An infant's diet properly prepared from cow's milk, water and Mellin's Food contains the essential food constituents for maintenance and for growth; a diet adequate in amount and character of nitrogen-containing food together with heat and energy-giving elements and inorganic salts.

All formulas in this book and the analytical work in relation to each are based upon the analyses of Mellin's Food, whole cow's milk, skimmed milk and top milk which appear on pages 74, 75 and 76.

Whole Milk Formulas
(For Normal Infants)

The amount of whole milk in each of the formulas in the following whole milk modifications is usually sufficient for a normal infant of the indicated age and weight. The quantity of Mellin's Food directed in each formula is the minimum amount for the purpose intended. These statements

may be verified by a study of the percentages of food elements given in the analyses, by noting the daily intake of total solids expressed in grams, the Caloric value of the 24-hour mixture together with the source of the heat units and the amount of protein furnished in relation to the weight of the baby.

Infants that are smaller than the average and who weigh less may not require as much milk daily, but of this the physician will determine, being assisted much by having the above mentioned details immediately before him.

It is often advisable to increase the quantity of Mellin's Food, particularly if the baby is one with a large frame and rather thin in flesh, for such infants have a relatively greater surface area and require more heat and energy-giving food. If the baby does not digest the milk well, or if his feet and hands are persistently cold, the amount of Mellin's Food should be increased. While individual conditions will guide the physician in regard to the extra quantity of Mellin's Food needed, it is well to bear in mind that the predominating carbohydrate in Mellin's Food is maltose, which has the highest point of assimilation of any of the sugars and may be given in liberal amounts without danger of nutritional disturbance. The greater tolerance for maltose, together with its quick assimilation, makes Mellin's Food especially valuable as a source of body heat.

Directions

In preparing the following mixtures, simply dissolve the Mellin's Food in the water, and then add the milk. No cooking is required.

Prepare the modification two or three hours before using, so that the Mellin's Food may have sufficient time to soften the curd of the milk, as already explained.

Milk that is fresh, clean and of a good quality should always be used with Mellin's Food. The mixed milk from Holstein or Ayrshire cows or from a herd of ordinary grade cows is generally the most suitable. The milk from Jersey and Guernsey cows is too rich in fat to be used in infant feeding without first removing 2 or 3 ounces of the topmost cream.

Whole Milk Formulas

For Infants about One Month Old or Younger

(Average weight 8½ pounds)

Mellin's Food	*5 level tablespoonfuls*
Whole Milk	*9 fluidounces*
Water	*15 fluidounces*

(This amount is sufficient for 24 hours.)

Give the baby 3 ounces every 2½ hours; 8 feedings in the 24 hours.

Increase the quantity of milk one ounce every seventh day until the amount of milk is 13 ounces; then prepare the modification according to the formula for an infant two months old.

Details relative to the nutritive value of the above modification will be found on the opposite page.

Analysis of the Foregoing Mixture

Fat			1.36
Proteins	milk	1.27	1.74
	cereal	.47	
Carbohydrates	lactose	1.71	5.32
	maltose	2.67	
	dextrins	.94	
Salts			.45
Water			91.13
			100.00

Weight in Grams of Food Elements in the Foregoing Mixture

Fat	10.20	Grams
Proteins	13.12	"
Carbohydrates	39.96	"
Salts	3.38	"

A total of 66.66 grams of well-balanced nourishment.

Calories Contributed by Food Elements in the Foregoing Mixture

Fat	95	Calories
Proteins	54	"
Carbohydrates	164	"

Total Calories in mixture = 313
Calories per fluidounce = 13
Energy-quotient, or Calories per pound of body-weight = 36.8

The amount of protein in the foregoing mixture equals the protein in 1.45 ounces of whole milk to each pound of body-weight.

Whole Milk Formulas

For Infants about Two Months Old

(Average weight 10¾ pounds)

Mellin's Food	*5½ level tablespoonfuls*
Whole Milk	*13 fluidounces*
Water	*15 fluidounces*

(This amount is sufficient for 24 hours.)

Give the baby 4 ounces every 3 hours; 7 feedings in the 24 hours.

Increase the quantity of milk one ounce every tenth day until the amount of milk is 16 ounces, and increase the quantity of water one-half ounce every fifteenth day until the amount of water is 16 ounces; then prepare the modification according to the formula for an infant three months old.

Details relative to the nutritive value of the above modification will be found on the opposite page.

Analysis of the Foregoing Mixture

Fat			1.68
Proteins	milk	1.59	2.03
	cereal	.44	
Carbohydrates	lactose	2.12	5.51
	maltose	2.51	
	dextrins	.88	
Salts			.50
Water			90.28
			100.00

Weight in Grams of Food Elements in the Foregoing Mixture

Fat	14.71 Grams
Proteins	17.73 "
Carbohydrates	48.39 "
Salts	4.38 "

A total of 85.21 grams of well-balanced nourishment.

Calories Contributed by Food Elements in the Foregoing Mixture

Fat	137 Calories
Proteins	73 "
Carbohydrates	198 "

Total Calories in mixture = 408
Calories per fluidounce = 14.6
Energy-quotient, or Calories per pound of body-weight = 38

The amount of protein in the foregoing mixture equals the protein in 1.55 ounces of whole milk to each pound of body-weight.

Whole Milk Formulas

For Infants about Three Months Old

(Average weight 12¼ pounds)

Mellin's Food	*6 level tablespoonfuls*
Whole Milk	*16 fluidounces*
Water	*16 fluidounces*

(This amount is sufficient for 24 hours.)

Give the baby 4½ ounces every 3 hours; 7 feedings in the 24 hours.

Increase the quantity of milk one ounce every sixth day until the amount of milk is 21 ounces, and decrease the quantity of water one ounce every fifteenth day until the amount of water is 14 ounces; then prepare the modification according to the formula for an infant four months old.

Details relative to the nutritive value of the above modification will be found on the opposite page.

Analysis of the Foregoing Mixture

Fat			1.81
Proteins	milk	1.70	2.12
	cereal	.42	
Carbohydrates	lactose	2.29	5.54
	maltose	2.40	
	dextrins	.85	
Salts			.52
Water			90.01
			100.00

Weight in Grams of Food Elements in the Foregoing Mixture

Fat	18.10	Grams
Proteins	21.28	"
Carbohydrates	55.39	"
Salts	5.17	"

A total of 99.94 grams of well-balanced nourishment.

Calories Contributed by Food Elements in the Foregoing Mixture

Fat	168	Calories
Proteins	87	"
Carbohydrates	227	"

Total Calories in mixture = 482
Calories per fluidounce = 15.1
Energy-quotient, or Calories per pound of body-weight = 39.3

The amount of protein in the foregoing mixture equals the protein in 1.63 ounces of whole milk to each pound of body-weight.

Whole Milk Formulas

For Infants about Four Months Old

(Average weight 13¾ pounds)

Mellin's Food	*6½ level tablespoonfuls*
Whole Milk	*21 fluidounces*
Water	*14 fluidounces*

(This amount is sufficient for 24 hours.)

Give the baby 5 ounces every 3 hours; 7 feedings in the 24 hours.

Increase the quantity of milk one ounce every fifteenth day until the amount of milk is 23 ounces, and in the meantime decrease the water one ounce; then prepare the modification according to the formula for an infant five months old.

Details relative to the nutritive value of the above modification will be found on the opposite page.

Analysis of the Foregoing Mixture

Fat			2.16
Proteins	milk	2.04	2.46
	cereal	.42	
Carbohydrates	lactose	2.74	5.94
	maltose	2.37	
	dextrins	.83	
Salts			.58
Water			88.86
			100.00

Weight in Grams of Food Elements in the Foregoing Mixture

Fat	23.74	Grams
Proteins	26.97	"
Carbohydrates	65.26	"
Salts	6.38	"

A total of 122.35 grams of well-balanced nourishment.

Calories Contributed by Food Elements in the Foregoing Mixture

Fat	221	Calories
Proteins	111	"
Carbohydrates	268	"

Total Calories in mixture = 600
Calories per fluidounce = 17.1
Energy-quotient, or Calories per pound of body-weight = 43.6

The amount of protein in the foregoing mixture equals the protein in 1.84 ounces of whole milk to each pound of body-weight.

Whole Milk Formulas

For Infants about Five Months Old

(Average weight 15 pounds)

Mellin's Food	*8 level tablespoonfuls*
Whole Milk	*23 fluidounces*
Water	*13 fluidounces*

(This amount is sufficient for 24 hours.)

Give the baby 6 ounces every 3 hours; 6 feedings in the 24 hours.

Increase the quantity of milk one ounce every seventh day until the amount of milk is 27 ounces, and decrease the quantity of water one ounce every seventh day until the amount of water is 9 ounces; then prepare the modification according to the formula for an infant six months old.

Details relative to the nutritive value of the above modification will be found on the opposite page.

Analysis of the Foregoing Mixture

Fat			2.28
Proteins	milk	2.15	2.65
	cereal	.50	
Carbohydrates	lactose	2.89	6.69
	maltose	2.81	
	dextrins	.99	
Salts			.64
Water			87.74
			100.00

Weight in Grams of Food Elements in the Foregoing Mixture

Fat	26.01 Grams
Proteins	30.15 "
Carbohydrates	76.24 "
Salts	7.24 "

A total of 139.64 grams of well-balanced nourishment.

Calories Contributed by Food Elements in the Foregoing Mixture

Fat	242 Calories
Proteins	124 "
Carbohydrates	313 "

Total Calories in mixture = 679
Calories per fluidounce = 18.9
Energy-quotient, or Calories per pound of body-weight = 45.3

The amount of protein in the foregoing mixture equals the protein in 1.89 ounces of whole milk to each pound of body-weight.

Whole Milk Formulas

For Infants about Six Months Old

(Average weight 16 pounds)

Mellin's Food	***8 level tablespoonfuls***
Whole Milk	***27 fluidounces***
Water	***9 fluidounces***

(This amount is sufficient for 24 hours.)

Give the baby 6 ounces every 3 hours; 6 feedings in the 24 hours.

Details relative to the nutritive value of the above modification will be found on the opposite page.

The above formula is of sufficient strength to meet the requirements of normal infants for the remaining period of bottle feeding. Therefore the following formulas contain the same proportions of milk and water and the same relative amount of Mellin's Food. As the baby grows older, additional nourishment is provided by gradually increasing the quantity at each feeding and increasing the total amount for the twenty-four hours.

Analysis of the Foregoing Mixture

Fat			2.67
Proteins	milk	2.52	3.01
	cereal	.49	
Carbohydrates	lactose	3.38	7.17
	maltose	2.80	
	dextrins	.99	
Salts			.71
Water			86.44
			100.00

Weight in Grams of Food Elements in the Foregoing Mixture

Fat	30.52 Grams
Proteins	34.42 "
Carbohydrates	81.97 "
Salts	8.10 "

A total of 155.01 grams of well-balanced nourishment.

Calories Contributed by Food Elements in the Foregoing Mixture

Fat	284 Calories
Proteins	141 "
Carbohydrates	336 "

Total Calories in mixture = 761
Calories per fluidounce = 21.1
Energy-quotient, or Calories per pound of body-weight = 47.6

The amount of protein in the foregoing mixture equals the protein in 2.02 ounces of whole milk to each pound of body-weight.

Whole Milk Formulas

For Infants about Seven Months Old

(Average weight 17 pounds)

Mellin's Food	***9 level tablespoonfuls***
Whole Milk	***30 fluidounces***
Water	***10 fluidounces***

(This amount is sufficient for 24 hours.)

Give the baby 6½ ounces every 3 hours, 6 feedings in the 24 hours.

Details relative to the nutritive value of the above modification will be found on the opposite page.

Note:—Occasionally normal infants over six months of age and particularly during the hot summer season may develop a slight digestive disturbance from a temporary inability to take care of the amount of cream in the mixture. This difficulty is easily and quickly overcome by reducing the amount of fat by removing an ounce or two of the topmost cream from the milk. In order to make up for the loss in Caloric value from this temporary removal of the cream another level tablespoonful or two of Mellin's Food should be added. The most common symptoms that indicate this procedure are regurgitation of sour vomitus an hour or more after feeding, irregularities of the bowel movements and an ammoniacal urine. If fat intolerance persists and symptoms become more pronounced it would be advisable to use one of the modifications suggested in the series of "Skimmed Milk Formulas" which will be found further along in this book.

Analysis of the Foregoing Mixture

Fat			2.67
Proteins	milk	2.52	3.02
	cereal	.50	
Carbohydrates	lactose	3.38	7.21
	maltose	2.83	
	dextrins	1.00	
Salts			.71
Water			86.39
			100.00

Weight in Grams of Food Elements in the Foregoing Mixture

Fat	33.91	Grams
Proteins	38.32	"
Carbohydrates	91.68	"
Salts	9.03	"

A total of 172.94 grams of well-balanced nourishment.

Calories Contributed by Food Elements in the Foregoing Mixture

Fat	315	Calories
Proteins	157	"
Carbohydrates	376	"

Total Calories in mixture = 848
Calories per fluidounce = 21.2
Energy-quotient, or Calories per pound of body-weight = 49.9

The amount of protein in the foregoing mixture equals the protein in 2.11 ounces of whole milk to each pound of body-weight.

Whole Milk Formulas

For Infants about Eight Months Old

(Average weight 18 pounds)

Mellin's Food	***9½ level tablespoonfuls***
Whole Milk	***32 fluidounces***
Water	***10 fluidounces***

(This amount is sufficient for 24 hours.)

Give the baby 7 ounces every 3 hours; 6 feedings in the 24 hours.

The energy-quotient of the above mixture, or Calories per pound of body-weight = 50.1.

The amount of protein in the above mixture equals the protein in 2.13 ounces of whole milk to each pound of body-weight.

For Infants about Nine Months Old

(Average weight 19 pounds)

Mellin's Food	***9½ level tablespoonfuls***
Whole Milk	***32 fluidounces***
Water	***10 fluidounces***

(This amount is sufficient for 24 hours.)

Give the baby 8½ ounces every 4 hours; 5 feedings in the 24 hours.

The energy-quotient of the above mixture, or Calories per pound of body-weight = 47.5.

The amount of protein in the above mixture equals the protein in 2.01 ounces of whole milk to each pound of body-weight.

As the two formulas given above are identical, further details relative to the nutritive value given on the opposite page are applicable to both.

(See "Note" on page 20.)

Analysis of the Foregoing Mixtures

Fat			2.71
Proteins	milk	2.56	3.06
	cereal	.50	
Carbohydrates	lactose	3.43	7.28
	maltose	2.85	
	dextrins	1.00	
Salts			.72
Water			86.23
			100.00

Weight in Grams of Food Elements in the Foregoing Mixtures

Fat	36.17	Grams
Proteins	40.81	"
Carbohydrates	97.25	"
Salts	9.60	"

A total of 183.83 grams of well-balanced nourishment.

Calories Contributed by Food Elements in the Foregoing Mixtures

Fat	336	Calories
Proteins	167	"
Carbohydrates	399	"

Total Calories in mixtures = 902
Calories per fluidounce = 21.5

Whole Milk Formulas

For Infants about Ten Months Old

(Average weight 19¾ pounds)

Mellin's Food	*10 level tablespoonfuls*
Whole Milk	*34 fluidounces*
Water	*11 fluidounces*

(This amount is sufficient for 24 hours.)

Give the baby 9 ounces every 4 hours; 5 feedings in the 24 hours.

The energy-quotient of the above mixture, or Calories per pound of body-weight = 48.4.

The amount of protein in the above mixture equals the protein in 2.06 ounces of whole milk to each pound of body-weight.

For Infants about Eleven Months Old

(Average weight 20½ pounds)

Mellin's Food	*10 level tablespoonfuls*
Whole Milk	*34 fluidounces*
Water	*11 fluidounces*

(This amount is sufficient for 24 hours.)

Give the baby 9 ounces every 4 hours; 5 feedings in the 24 hours.

The energy-quotient of the above mixture, or Calories per pound of body-weight = 46.6.

The amount of protein in the above mixture equals the protein in 1.98 ounces of whole milk to each pound of body-weight.

(See "Note" on page 20.)

Whole Milk Formulas

For Infants about Twelve Months Old

(Average weight 21 pounds)

Mellin's Food	*10 level tablespoonfuls*
Whole Milk	*34 fluidounces*
Water	*11 fluidounces*

(This amount is sufficient for 24 hours.)

Give the baby 9 ounces every 4 hours; 5 feedings in the 24 hours.

The energy-quotient of the above mixture, or Calories per pound of body-weight = 45.5.

The amount of protein in the above mixture equals the protein in 1.93 ounces of whole milk to each pound of body-weight.

As the formulas for infants 10 and 11 months old on the preceding page and the formula for a baby 12 months of age given above are alike, the analysis and other details relative to the nutritive value given on the following page apply equally to each of these three formulas.

(See "Note" on page 20.)

Analysis of the Foregoing Mixtures

Fat			2.69
Proteins	milk	2.54	3.03
	cereal	.49	
Carbohydrates	lactose	3.41	7.20
	maltose	2.80	
	dextrins	.99	
Salts			.71
Water			86.37
			100.00

Weight in Grams of Food Elements in the Foregoing Mixtures

Fat	38.43	Grams
Proteins	43.29	"
Carbohydrates	102.82	"
Salts	10.17	"

A total of 194.71 grams of well-balanced nourishment.

Calories Contributed by Food Elements in the Foregoing Mixtures

Fat	357	Calories
Proteins	177	"
Carbohydrates	422	"

Total Calories in mixtures = 956
Calories per fluidounce = 21.2

Skimmed Milk Formulas

(For Infants with Fat Intolerance)

Some infants cannot take care of the amount of cream that is usually present in mixtures made from whole milk and this inability to digest milk fat necessitates a different procedure from that suggested in preparing whole milk modifications. Simply substituting skimmed milk for whole milk might seem to be all that would be required to meet the condition, but considering the loss of one of the sources of body heat by removing the fat of the milk and the diminished total Caloric value, it is evident that something further must be done to solve this problem properly. Here again Mellin's Food is of assistance, for the principal carbohydrate in Mellin's Food is maltose, a most economical source of heat and energy, and well suited to make up for the Calories lost through the absence of fat.

In suggesting the following formulas of skimmed milk and

Mellin's Food, careful thought has been given to the condition to which they may be applied, and the amount of skimmed milk, water and Mellin's Food in each formula is based upon considerable experience in the feeding of babies with retarded development due to fat intolerance.

In nutritional disturbances commonly known as marasmus or malnutrition these low-fat, high-carbohydrate mixtures are particularly well suited, for infants in this condition have much difficulty in digesting fat, yet need an abundance of heat-producing food. Marasmic infants respond very well indeed when this method is consistently carried out, and the results are extremely gratifying.

Other symptoms that indicate the advisability of employing skimmed milk modifications are repeated regurgitation of food material an hour or more after several of the daily feedings, an ammoniacal urine, eczema, and

that form of constipation where the stools are light gray in color and greasy or soap-like in consistency.

It should be emphasized that the purpose of skimmed milk modifications is to overcome some difficulty that appears to interfere with an infant's progress, and after this is accomplished a gradual return to whole milk modifications should be made by removing less and less cream from the milk used. An exception to this general rule of temporary procedure is in cases of marasmus, where it will be found necessary in most instances to continue the low-fat, high-carbohydrate formulas throughout the entire period of bottle feeding, for these babies seldom develop any considerable capacity for digesting cream.

To obtain the skimmed milk employed in these formulas, proceed in the following manner: Let a quart of whole milk stand for 4 or 5 hours, or until the cream line is well defined. Remove all of the cream with a cream dipper or pour off slowly the upper 16 ounces. The milk left in the bottle will contain about one per cent fat.

Skimmed Milk Formulas

Formula No. 1

*For Infants Two or Three Months Old

(Weighing about 7 pounds)

Mellin's Food	***8 level tablespoonfuls***
Skimmed Milk (1% fat)	***9 fluidounces***
Water	***15 fluidounces***

(This amount is sufficient for 24 hours.)

Give the baby 3 ounces every 2½ hours; 8 feedings in the 24 hours; or 3½ ounces every 3 hours; 7 feedings in the 24 hours.

As a baby's weight is of particular importance in adjusting the diet in conditions requiring skimmed milk modifications, this factor has been considered in submitting the above formula and the three that complete this series. A study of the nutritive value of the mixtures, details of which are given on the page opposite each formula, will show that these formulas meet the protein need and the Caloric requirements of infants of the stated weights.

For babies of the same age weighing about nine pounds, the modification that follows (Formula No. 2) is suggested.

*Babies less than two months old rarely develop symptoms that necessitate the employment of skimmed milk, for whole milk modifications used in these early months of life are so well diluted that the amount of cream present is not enough to cause fat disturbances.

Analysis of the Foregoing Mixture

Fat			.37
Proteins	milk	1.28	2.01
	cereal	.73	
Carbohydrates	lactose	1.72	7.32
	maltose	4.14	
	dextrins	1.46	
Salts			.56
Water			89.74
			100.00

Weight in Grams of Food Elements in the Foregoing Mixture

Fat	2.84	Grams
Proteins	15.54	"
Carbohydrates	56.61	"
Salts	4.32	"

Calories Contributed by Food Elements in the Foregoing Mixture

Fat	26	Calories
Proteins	64	"
Carbohydrates	232	"

Total Calories in mixture = 322
Calories per fluidounce = 13.4
Energy-quotient, or Calories per pound of body-weight = 46

The amount of protein in the foregoing mixture equals the protein in 2.08 ounces of whole milk to each pound of body-weight.

Skimmed Milk Formulas

Formula No. 2

For Infants Two or Three Months Old

(Weighing about 9 pounds)

Mellin's Food	***10 level tablespoonfuls***
Skimmed Milk (1% fat)	***13 fluidounces***
Water	***19 fluidounces***

(This amount is sufficient for 24 hours.)

Give the baby 4 ounces every 2½ hours; 8 feedings in the 24 hours; or 4½ ounces every 3 hours; 7 feedings in the 24 hours.

This formula is of frequent usefulness, for at this age many infants show the first signs of deferred development by having failed to add much to their birth weight. To allow these babies to continue on a diet that has thus proved to be so inadequate is to invite a chronic state of inanition. This may be avoided in a great many cases by following out the scheme of feeding of which the above formula may be taken as a starting point. The details given on the opposite page will assure the physician that this procedure is rational, and this information will also be a guide for strengthening the mixture as the baby improves.

For older infants who weigh more, refer to Formula No. 3 or Formula No. 4.

Analysis of the Foregoing Mixture

Fat			.40
Proteins	milk	1.39	2.08
	cereal	.69	
Carbohydrates	lactose	1.87	7.14
	maltose	3.90	
	dextrins	1.37	
Salts			.56
Water			89.82
			100.00

Weight in Grams of Food Elements in the Foregoing Mixture

Fat	4.09	Grams
Proteins	21.35	"
Carbohydrates	73.35	"
Salts	5.79	"

Calories Contributed by Food Elements in the Foregoing Mixture

Fat	38	Calories
Proteins	88	"
Carbohydrates	301	"

Total Calories in mixture = 427

Calories per fluidounce = 13.3

Energy-quotient, or Calories per pound of body-weight = 47.4

The amount of protein in the foregoing mixture equals the protein in 2.22 ounces of whole milk to each pound of body-weight.

Skimmed Milk Formulas

Formula No. 3

For Infants Four or Five Months Old

(Weighing about 11 pounds)

Mellin's Food	***11½ level tablespoonfuls***
Skimmed Milk (1% fat)	***17 fluidounces***
Water	***19 fluidounces***

(This amount is sufficient for 24 hours.)

Give the baby 5 ounces every 3 hours; 7 feedings in the 24 hours; or 6 ounces every 3 hours; 6 feedings in the 24 hours.

This formula is applicable to the same condition as mentioned under Formula No. 2 and may well be considered as one of the steps in the gradual building up of the previous formula to meet the baby's increasing ability to appropriate more nourishment; or it may very properly be the correct beginning of the feeding of an under-nourished infant four or five months old of the indicated weight.

This formula may also be applied as a temporary diet where a fat intolerance is in evidence, yet not so distinctly marked as to be classed as malnutrition. When thus employed, considerable latitude relative to age and weight may be allowed; for a gradual return to the regular modification would be the plan as the characteristic symptoms of the disturbance disappear.

Analysis of the Foregoing Mixture

Fat			.46
Proteins	milk	1.61	2.31
	cereal	.70	
Carbohydrates	lactose	2.17	7.54
	maltose	3.97	
	dextrins	1.40	
Salts			.61
Water			89.08
			100.00

Weight in Grams of Food Elements in the Foregoing Mixture

Fat	5.33 Grams
Proteins	26.81 "
Carbohydrates	87.38 "
Salts	7.11 "

Calories Contributed by Food Elements in the Foregoing Mixture

Fat	50 Calories
Proteins	110 "
Carbohydrates	358 "
Total Calories in mixture	= 518
Calories per fluidounce	= 14.4
Energy-quotient, or Calories per pound of body-weight	= 47.1

The amount of protein in the foregoing mixture equals the protein in 2.29 ounces of whole milk to each pound of body-weight.

Skimmed Milk Formulas

Formula No. 4

For Infants Six Months Old and Over

(Weighing about 13 pounds)

Mellin's Food ***11 level tablespoonfuls***
Skimmed Milk (1% fat) ***23 fluidounces***
Water ***13 fluidounces***

(This amount is sufficient for 24 hours.)

Give the baby 6 ounces every 3 hours; 6 feedings in the 24 hours.

The above formula is another step toward supplying the demand for more assimilable nourishment as the underweight baby progresses, and from now on it is a simple matter to meet further requirements by gradually increasing the amount of skimmed milk and decreasing the amount of water until the proportion of milk and water is that usually employed for normal infants.

These four formulas which comprise the series of skimmed milk modification are worthy of careful attention for they suggest a practical means of successfully adjusting the diet in a great many difficult feeding cases.

Analysis of the Foregoing Mixture

Fat			.62
Proteins	milk	2.18	2.84
	cereal	.66	
Carbohydrates	lactose	2.93	8.05
	maltose	3.79	
	dextrins	1.33	
Salts			.71
Water			87.78
			100.00

Weight in Grams of Food Elements in the Foregoing Mixture

Fat	7.15	Grams
Proteins	33.07	"
Carbohydrates	93.53	"
Salts	8.28	"

Calories Contributed by Food Elements in the Foregoing Mixture

Fat	66	Calories
Proteins	136	"
Carbohydrates	383	"

Total Calories in mixture = 585
Calories per fluidounce = 16.3
Energy-quotient, or Calories per pound of body-weight = 45

The amount of protein in the foregoing mixture equals the protein in 2.39 ounces of whole milk to each pound of body-weight.

Top Milk Formulas

Most infants do very well upon whole milk modifications, and it is therefore usually unnecessary to employ higher percentages of fat than arranged for in the series of formulas in the first part of this book. There are occasions, however, when very young babies may require more fat than is present in whole milk modifications, for in the very early months of life and particularly where protein digestion is weak it is sometimes necessary to dilute whole milk to such an extent that the fat content of the mixture is too low. In order to meet this condition the following Top Milk Formulas are suggested—one prepared from top milk containing 7% of fat and the other from 10% top milk.

To obtain 7% top milk, let a quart of whole milk stand for 4 or 5 hours, or until the cream line is clearly defined. Then remove with a dipper or pour off slowly the

Top Milk Formulas (*Continued*)

upper 16 ounces, which will contain about 7 per cent fat.

To obtain 10% top milk, let the milk stand as just directed, and then remove with a dipper the upper 10 ounces, which will contain about 10 per cent fat.

Top Milk Formulas

(Formula A)

Mellin's Food	*5 level tablespoonfuls*
Top Milk (7% fat)	*6 fluidounces*
Water	*18 fluidounces*

(This amount is sufficient for 24 hours.)

Give the baby 3 ounces every 2½ hours; 8 feedings in the 24 hours.

This special formula is useful for infants one month old or younger in meeting the particular condition described on page 38.

If a little higher fat is desired, increasing the top milk to 7 ounces and decreasing the water to 17 ounces will raise the fat to about 2%. To increase the fat still further without disturbing the percentage of other elements, refer to Formula B.

The nutritive value of the above mixture set forth on the opposite page will guide the physician in any other changes in the formula.

Analysis of the Foregoing Mixture

Fat			1.71
Proteins	milk	.82	1.29
	cereal	.47	
Carbohydrates	lactose	1.10	4.72
	maltose	2.68	
	dextrins	.94	
Salts			.36
Water			91.92
			100.00

Weight in Grams of Food Elements in the Foregoing Mixture

Fat	12.80	Grams
Proteins	9.67	"
Carbohydrates	35.34	"
Salts	2.70	"

A total of 60.51 grams of well-balanced nourishment.

Calories Contributed by Food Elements in the Foregoing Mixture

Fat	119	Calories
Proteins	40	"
Carbohydrates	145	"

Total Calories in mixture = 304
Calories per fluidounce = 12.7

Top Milk Formulas

(Formula B)

Mellin's Food	*5 level tablespoonfuls*
Top Milk (10% fat)	*6 fluidounces*
Water	*18 fluidounces*

(This amount is sufficient for 24 hours.)

Give the baby 3 ounces every 2½ hours; 8 feedings in the 24 hours.

The above formula contains more fat than the preceding one and a higher Caloric value, but the percentage of other elements is practically the same. This formula may therefore be considered as interchangeable with Formula A for infants of the same age, and in the condition already mentioned.

If a higher fat content is desired, increasing the top milk to 7 ounces and decreasing the water to 17 ounces will raise the fat to about 3% without materially affecting the percentage of other elements.

On the opposite page full details are given relative to the nutritive value of this modification.

Analysis of the Foregoing Mixture

Fat			2.44
Proteins	milk	.79	1.26
	cereal	.47	
Carbohydrates	lactose	1.07	4.69
	maltose	2.68	
	dextrins	.94	
Salts			.35
Water			91.26
			100.00

Weight in Grams of Food Elements in the Foregoing Mixture

Fat	18.21	Grams
Proteins	9.46	"
Carbohydrates	35.06	"
Salts	2.64	"

A total of 65.37 grams of well-balanced nourishment.

Calories Contributed by Food Elements in the Foregoing Mixture

Fat	169	Calories
Proteins	39	"
Carbohydrates	144	"

Total Calories in mixture = 352
Calories per fluidounce = 14.7

Mellin's Food and Water Formula

Mellin's Food — *4 level tablespoonfuls*
Water (boiled, then cooled) *16 fluidounces*

The above mixture is offered as a temporary diet for infants of any age or weight where a small amount of nourishment is desired to meet some particular requirement or any condition where it seems advisable to discontinue the use of milk for a few days.

The analysis of the mixture and nutritive value appear on the opposite page, thus giving an opportunity for physicians to more fully appreciate the many instances where nourishment of this sort may be applied to advantage.

Conditions that respond particularly well to the administration of nourishment in this form are intestinal disturbances commonly known as diarrhea, which will be taken up in detail beginning on page 62. The Mellin's Food and water mixture may also be used with much satisfaction in severe vomiting, and this will be mentioned again further along in this book.

Analysis of the Foregoing Mixture

Fat		trace
Proteins	(cereal)	.56
Carbohydrates	maltose 3.20, dextrins 1.13	4.33
Salts		.23
Water		94.88
		100.00

Weight in Grams of Food Elements in the Foregoing Mixture

Proteins	2.82 Grams
Carbohydrates	21.66 "
Salts	1.17 "

Calories Contributed by Food Elements in the Foregoing Mixture

Proteins	12 Calories
Carbohydrates	89 "

Total Calories in mixture = **101**
Calories per fluidounce = 6.3

Stools

Examination of the stools is of much assistance in adjusting the diet in nutritional disturbances and very helpful also as an assurance that various elements which enter into the diet are being properly digested and well assimilated. Variations in color, odor and consistency of a baby's movements should be taken seriously as possible symptoms of some disturbance in nutrition.

To examine the stools properly the solid parts should be smoothed out upon the napkin, thus exposing to view the entire fecal mass. The surface color may be misleading unless the stool be examined immediately after the movement, because all stools grow darker upon the surface after exposure to the air. The surface color may also be green and yet have no pathological significance.

The normal stools of a baby fed upon a Mellin's Food modifica-

tion are soft, smooth and homogeneous, somewhat firmer in consistency than the stools of a breast-fed baby, and free from disagreeable odor. They are brown or yellowish-brown in color.

Stools that contain firm, tough, dry masses point to protein indigestion. Such stools often have a foul, offensive odor, indicating decomposition of milk protein and a lowered protein assimilation. These casein curds are insoluble in ether and become very hard when placed in a solution of formaldehyd.

Stools that are light gray in color, greasy, shiny and soap-like in consistency, indicate a failure to appropriate all or a part of the fat of the milk. These stools are often sour in odor, but not particularly offensive. Fat stools leave a greasy stain when placed upon soft paper for a few moments. Fat curds are fairly soluble in

ether but are not affected by a solution of formaldehyd. An excess of fat in the stools is a common cause of irritated buttocks, owing to high acid reaction.

Foamy, frothy, bubbling stools, often accompanied by intestinal gas, are indicative of sugar or starch indigestion. Such stools are exceedingly rare where a Mellin's Food modification is used, for maltose and dextrins, the carbohydrates in Mellin's Food, are so readily digested and so completely assimilated that carbohydrate indigestion is very uncommon.

Constipation

The use of laxatives to overcome constipation in infancy does not appeal to the physician's best judgment, for such means afford at best temporary relief only. Therefore the ability to recognize by a simple examination of the stools the most common causes of constipation and to be able to correct the difficulty by some slight change in the food formula must be of considerable satisfaction.

Constipation may be due to imperfect digestion of the protein, or of the fat. Starchy foods often cause this condition. Less frequent causes of constipation are a diet too low in total solids, insufficient muscular contraction of the intestines due to lack of energy, and retention of the feces so long that the moisture is absorbed, leaving a dry, hard mass, difficult to expel.

Protein. If the casein portion of the milk protein is not properly

digested, constipation may result. The stools may contain firm, tough and dry masses, and the odor is foul or putrid—sometimes very offensive. Distention of the abdomen, gas, colic and general discomfort after eating frequently accompany this condition.

Infants fed upon a milk modification containing the directed amount of Mellin's Food are not likely to develop protein constipation, for Mellin's Food furnishes the means for changing the character of the casein.

This is accomplished in the following manner. In the beginning of the process of milk digestion, coagulation of the casein portion of milk protein takes place, and if Mellin's Food is present as the modifier about twenty-five per cent of it is occluded in the casein coagulum. This occluded Mellin's Food is in solution, and the resulting physical condition of the

coagulated casein is a soft, flocculent, sponge-like curd, easily permeated by the fluids of the stomach and thus made ready for a more complete protein digestion. Where the difficulty in digesting the casein is especially pronounced, it is advisable to use more Mellin's Food than suggested in the regular formulas, increasing the quantity of Mellin's Food until a soft, smooth stool results. It may also be necessary to reduce the proportion of milk temporarily.

In constipation due to a failure to appropriate milk protein, the presence of casein curds in the stools is not necessarily the outstanding symptom, for oftentimes the movements are smooth and apparently well digested. The stools, however, are always very offensive and give off an odor that is unmistakable when once recognized—foul, putrid and resembling decomposed animal matter.

Fat. Infants fed upon mixtures containing more cream than can be taken care of are often extremely constipated. In this type the stools are light gray in color, greasy, shiny and soap-like in consistency. The odor is sour, and not offensive, being quite distinct from protein stools in this respect. Usually the urine has a strong ammoniacal odor, and there is a tendency to spit up an hour or more after feeding. Eczema is sometimes associated with this disturbance.

Constipation due to fat intolerance is readily corrected by using skimmed milk as the basis of the diet with Mellin's Food as the modifier. Taking away the cream removes the cause, while the use of Mellin's Food in liberal amounts maintains the fuel value of the mixture. Mellin's Food is particularly indicated on account of its content of maltose, a carbo-

hydrate having such a high point of assimilation that it may be safely used in sufficient amount to compensate for the loss in Caloric value from the necessary employment of skimmed milk. Where fat constipation is not of long standing, the proportion of milk and water suggested for normal infants need not be changed, but the cream should be removed and the Mellin's Food increased as just stated. If this form of constipation has persisted for some time it is best to employ temporarily one of the skimmed milk formulas given on pages 30 to 36.

Starchy Foods. The employment of diluents containing starch or the use of carbohydrate compounds having a high dextrins content is frequently followed by a most stubborn constipation. It is a simple matter to correct this by preparing the diet according to

one of the formulas for normal infants given in the first series in this book. Mellin's Food is free from starch and the dextrins content is low.

Deficiency in Total Solids. A formula deficient in total solids, or a deficiency in total daily intake of food, may cause the infant to show symptoms of constipation. This is a condition where the diet should be made stronger by increasing both milk and Mellin's Food and reducing the amount of water, or by increasing the amount of daily food by giving more at each feeding.

In these cases a knowledge of the Caloric value of the total daily food is of great advantage, as it gives to the physician a means of determining whether the baby is really being underfed or not. The Caloric value of all modifications in this book is given on the page

following each formula, and by referring to this information physicians will have no difficulty in solving this problem.

Lack of Energy. Another cause of constipation is insufficient muscular contraction in the intestines from lack of energy. This condition is seen more commonly in marasmus, but is often observed in infants whose digestion is good and who are apparently well otherwise. In such conditions the fecal masses are propelled so slowly and remain so long in the intestines that the liquid part is absorbed, leaving a dry, hard residue difficult to expel.

To assist in restoring the intestinal walls to their normal activity, an increase in the energy-giving part of the diet is indicated. This extra energy is readily supplied by maltose and dextrins, which form the carbohydrate content of Mellin's Food.

Colic

Feeding too rapidly, feeding irregularly or overfeeding are the most common causes of colic. A food too weak for the baby's requirements and too long a period between feedings, usually followed in either case by much fussing and crying just before feeding time, favors an accumulation of gas in the stomach, which very naturally results in distressing colicky pains. Relief from colic due to these causes is of course readily brought about by a better management of the diet.

Another common cause of colic, often overlooked, is the rapid coagulation of the casein in the infant's stomach during the first process of digestion, resulting in the formation of tough, leathery curds difficult of permeation by the digestive juices. To remedy this, a better attenuation of the casein is required, which can be accomplished most effectually by

Colic *(Continued)*

using an increased amount of Mellin's Food.

Colic may be caused indirectly by an excess of fat in the diet, in which case some of the symptoms mentioned under fat constipation will probably be present and will also point out a way for relief.

Vomiting

This condition is often an initial symptom of serious illness, and it is well always to have this in mind, for it suggests the possibility that the cause may be other than any fault with the diet. While waiting for a clearer diagnosis, it is a good plan to discontinue the regular diet and substitute a Mellin's Food and water mixture prepared as directed on page 44. The physician will be able to determine the proper quantity to give and the frequency of feeding by noting the

Vomiting (*Continued*)

nutritive value of the directed Mellin's Food and water mixture which appears on the page opposite the suggested formula.

When it is plainly evident that the vomiting is not significant of an impending illness, it is then an easy matter to correct the trouble. If the spitting-up occurs immediately after a feeding, it is usually due to a rapid intake of food. Overfeeding or feeding too frequently may also cause regurgitation immediately after feeding.

Where spitting-up occurs repeatedly half an hour or more after feeding, it is almost invariably due to an excess of fat in the mixture. To correct this trouble, the fat should be reduced, temporarily at least.

Appetite

Lack or loss of appetite is very often due to the use of milk overrich in cream. Where this is the cause of the trouble, indication of fat indigestion may also be present, such as repeated regurgitation or spitting-up some little time after feeding, constipation with light gray, greasy, shiny, soap-like stools, or an ammoniacal urine. Of course this condition calls for a reduction of the fat, but it may also be necessary to increase the carbohydrates in order to maintain the Caloric value of the mixture.

Loss of appetite may also result from previous overfeeding, or from irregularity in feeding, even though the formula be properly balanced.

Failure to Gain

A failure to gain properly, or loss in weight, is due to a faulty adjustment of the fat, protein or carbohydrates, or to an insufficient intake of food. The latter is easily remedied. Where the former is the cause of the trouble, this will usually be manifested by some sign of indigestion that will afford a key to the solution of the problem.

An increased amount of Mellin's Food is indicated in these cases, because maltose, the predominating carbohydrate in Mellin's Food, is the most easily utilized of all sugars and exerts the greatest influence upon the weight curve.

In all cases of failure to gain, and especially with babies over three months old, the physician should satisfy himself that the difficulty is not due to an excess of cream in the diet.

With young infants, under three or four months of age, where the

Failure to Gain *(Continued)*

milk is diluted considerably, and therefore the fat is necessarily low when whole milk is used, a better gain in weight is sometimes obtained from the use of a top milk formula (see top milk formulas).

Diarrhea

The problem of nutrition in acute intestinal disorders of infants is a matter of too much importance to be overlooked, for nourishment of the right kind is as influential in obtaining satisfactory results as all other factors combined. The danger of prolonged starvation is now accepted, and while it may be advisable to withhold all food for twelve or possibly twenty-four hours, nourishment is surely needed immediately after.

Careful thought must be given to the selection of nourishment, and milk modifications ordinarily used in normal conditions are usually contra-indicated in the early part of the treatment, although very soon after fat-free milk in small amounts may form part of the diet.

Food elements that are not directly fermentable either in themselves or from contact with such

Diarrhea (*Continued*)

bacteria as are present in the intestines, and elements that are quickly assimilated and immediately utilized for nutrition, form the basis for selecting proper food for this condition.

This sort of nourishment may be obtained by preparing the diet according to the following formula:

Mellin's Food ***4 level tablespoonfuls***
Water (boiled, then cooled) ***16 fluidounces***

To be given cold, or very warm (not lukewarm), in small quantities, frequently repeated. The baby's condition will guide the physician regarding the amount to be given, and the intervals of feeding.

As soon as the stools lessen in number and improve in character, small amounts of skimmed milk should be gradually substituted for equal amounts of water, until the proper proportions of Mellin's

Diarrhea (*Continued*)

Food, milk and water, adapted to the age of the baby, are reached.

As the fat of the milk is likely to be digested with much difficulty by infants after an attack of diarrhea, it is often good judgment to continue to leave out the cream until the baby has fully recovered. The fat may be gradually replaced as soon as the baby's condition warrants, by skimming less and less cream from the milk used.

On pages 44 and 45 the above formula is given, together with complete details relative to its composition, thus enabling the physician to note the amount and character of the carbohydrates, protein and salts and how well suited these elements are for maintenance of heat and energy, for protecting the protein of the organism and for replenishing the salts that are constantly eliminated as one of the results of frequent bowel movements.

Marasmus, Malnutrition, Atrophy

It is not easy to determine the reason for the retarded development characteristic of this nutritional disorder, but whatever the underlying cause may be, the real issue in correcting the trouble is to select food material that will be appropriated for the much-needed nourishment.

The food element that plays the most important part is one that will furnish the greatest amount of heat, for all infants in this condition have cold extremities and frequently show a sub-normal temperature. It is, therefore, of the utmost importance that these babies are kept warm. The element that is first thought of for heat production is fat, but, unfortunately, infants suffering from malnutrition have great difficulty in utilizing fat, and experience has shown that it is far better to exclude milk fat, for it is not only

poorly taken care of, but interferes with the digestion and assimilation of other food elements. Carbohydrates furnish heat and may be very properly employed to replace fat, but if composed of starch are contra-indicated on account of their limited digestibility. Cane sugar or milk sugar are objectionable, as fermentation is likely to follow their use in view of the necessity of employing high percentages of carbohydrates in order to furnish the requisite amount of heat.

Carbohydrates in the form of maltose and dextrins are well adapted, particularly if the proportion of maltose exceeds that of dextrins, for maltose has the highest point of assimilation of any of the carbohydrates, and in the stated condition a relatively large amount of a heat and energy-giving element is required.

The selection of Mellin's Food for the necessary heat and energy-giving element is a practical measure, for maltose and dextrins make up the carbohydrate content of Mellin's Food, and the amount of maltose is greater than the dextrins by about three times, as you will note from the analysis of Mellin's Food which appears in the last part of this book.

It should be emphasized that there is a decided advantage in employing a liberal amount of Mellin's Food, for marasmic infants need more Calories per pound of body-weight than infants who are well and thriving. Maltose is a safe carbohydrate, and in most cases results are more pronounced by using from eight to eleven level tablespoonfuls of Mellin's Food in the 24-hour mixture. Six level tablespoonfuls daily is the minimum quantity, and the

Marasmus, Malnutrition, Atrophy (*Continued*)

results may be disappointing if a lower amount is used, for the Caloric value will then fall short of the requirements (see skimmed milk formulas).

Eczema

There is a growing opinion that infantile eczema is usually a disorder of nutrition, but whether this statement is generally acceptable or not, the matter of diet should always be considered in all cases of skin eruptions in early life, for it may have such a bearing, either directly or indirectly, that satisfactory results are impossible if attention is not given to the composition of the food mixture; also if the food is inadequate to meet the nutritive requirements the resulting lowered vitality is in itself a hindrance to good recovery. In many cases of infantile eczema all the generally recognized symptoms of fat intolerance stand out clearly, and the frequency of this association directs the attention to the possibility, at least, that a failure to digest fat may have much to do with certain types of skin eruption. Consideration should also be given to overfeeding,

which may mean that the percentage of fat, protein and carbohydrates are altogether too high for the age and weight, or the food mixture may not be excessive in amount of these elements yet too large a quantity is given during the full twenty-four hours.

In cases of eczema accompanied with constipation, with light gray stools of a sour odor and having a greasy, soap-like appearance, an ammoniacal urine and repeated spitting up of food an hour or more after feeding, it is suggested that the diet be changed immediately to one containing a minimum amount of fat with a fairly high carbohydrate content. As a general guide and in order to explain the reasons for this procedure, we give on the following page a twenty-four hour formula that would be suitable for an infant about three months of age:

Mellin's Food	***8 level tablespoonfuls***
Skimmed Milk	***16 fluidounces***
Water	***16 fluidounces***

The composition of this mixture is approximately one-half of one per cent of fat, two and one-quarter per cent of protein and six and one-half per cent of carbohydrates. The desired minimum amount of fat is thus obtained, and the larger part of heat and energy lost by the removal of the cream is made up by the carbohydrates, which may be further increased by adding another level tablespoonful or two of Mellin's Food. The usual result that follows two or three days of this modification is first a change in color and consistency of the stools, with relief from constipation; the disappearance of ammonia in the urine; less frequent spitting up and then a gradual clearing up of the skin trouble.

There is a special reason why Mellin's Food should make up a

part of the food mixture which will be appreciated at once when it is remembered that the predominating carbohydrate in Mellin's Food is maltose, which has the highest point of assimilation of any of the sugars. As stated, it is often desirable to feed high percentages of carbohydrates in the condition in question, but it is not always safe to try to supply carbohydrates with sugar of milk or cane sugar, for neither are well taken care of in the required large amounts as readily as maltose. In conditions where no marked symptoms of fat intolerance can be detected it is well to find out the composition of the food mixture and to check up the Calories per pound of body-weight, for many of these infants may have developed a skin trouble from merely overfeeding. It is obvious that the procedure here would be a reduction in total solids or a reduc-

tion of any particular food element that is found to be greatly in excess of what it should be for a normal baby.

Analysis of Mellin's Food

Fat	.16
Proteins	10.35
Maltose	58.88
Dextrins	20.69
Soluble Carbohydrates	79.57
Salts	4.30
Water	5.62
	100.00

Weight of Mellin's Food

1 level tablespoonful = 105 grains or 6.805 grams.

1 ounce (by volume) = 203 grains or 13.156 grams.

Caloric Value of Mellin's Food

1 level tablespoonful = 25.18 Calories
1 ounce (by volume) = 48.68 "
1 ounce avoir. (437.5 grs.) = 105.00 "

One level tablespoonful of Mellin's Food increases the percentage of Carbohydrates, Proteins and Salts as follows:

In a	Carbohydrates	Proteins	Salts
16-oz. mixture	1.10%	.145%	.060%
20 " "	.89%	.116%	.048%
24 " "	.74%	.097%	.040%
28 " "	.64%	.083%	.035%
32 " "	.56%	.073%	.030%
35 " "	.51%	.067%	.028%
36 " "	.50%	.065%	.027%
40 " "	.45%	.058%	.024%
42 " "	.43%	.056%	.023%
45 " "	.40%	.052%	.022%

Analysis of Cow's Milk
(Average whole milk)

Fat	3.70
Proteins	3.50
Sugar	4.70
Salts	.70
Water	87.40
	100.00

Calories Contributed by Elements in One Fluidounce

Fat	10.48	Calories
Proteins	4.37	"
Sugar	5.87	"

Total Calories in one fluidounce = 20.72
Weight of one fluidounce = 470 grains or 30.46 grams

Analysis of Skimmed Milk
(1% Fat)

Fat	1.00
Proteins	3.60
Sugar	4.83
Salts	.72
Water	89.85
	100.00

Calories Contributed by Elements in One Fluidounce

Fat	2.84	Calories
Proteins	4.51	"
Sugar	6.06	"

Total Calories in one fluidounce = 13.41
Weight of one fluidounce = 472 grains or 30.58 grams

Analysis of Top Milk
(7% Fat)

Fat	7.00
Proteins	3.38
Sugar	4.54
Salts	.68
Water	84.40
	100.00

Calories Contributed by Elements in One Fluidounce

Fat	19.75	Calories
Proteins	4.20	"
Sugar	5.65	"

Total Calories in one fluidounce = 29.60
Weight of one fluidounce = 468 grains or 30.34 grams

Analysis of Top Milk
(10% Fat)

Fat	10.00
Proteins	3.27
Sugar	4.40
Salts	.65
Water	81.68
	100.00

Calories Contributed by Elements in One Fluidounce

Fat	28.13	Calories
Proteins	4.06	"
Sugar	5.46	"

Total Calories in one fluidounce = 37.65
Weight of one fluidounce = 467 grains or 30.25 grams

Calorie—Fuel Value

The value of food as fuel, or heat-giving property, is expressed in terms of potential energy. The unit commonly used is the Calorie, which is the amount of heat which will raise the temperature of a kilogram of water 1 degree C.

The Caloric value of Protein, Fats and Carbohydrates generally adopted is as follows:

1 gram of Protein	4.1	Calories
1 gram of Fat	9.3	"
1 gram of Carbohydrates	4.1	"

In infant feeding the number of Calories required for each 24 hours varies from 35 to 50 Calories per pound of body-weight. It must always be in mind, however, that the condition of the infant, the surface area, the activity of the baby and other factors all have an influence toward a wider variation of the figures given. Another matter to consider is that fats, proteins and carbohydrates are interchangeable so far as the Caloric value is concerned, thus allow-

ing a variation of the constituents of the diet to meet the digestive ability of the individual infant. In this connection it should be remembered that fats and carbohydrates, whose chief function is that of energy giving, are more freely interchangeable than proteins, as the latter is not economical for heat and energy.

A knowledge of Calories is very useful, as it enables the physician to determine quickly two extremes — underfeeding and overfeeding — but is of doubtful value if applied as a basic principle of infant feeding or used exclusively as a method of infant feeding.

The Caloric value of Mellin's Food, of whole milk, of skimmed milk and of top milk appears on pages 74, 75 and 76.

In addition, accompanying each formula throughout the book will be found its Caloric value per fluidounce and the Caloric value of the amount suggested for a full day's feeding.

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21. 6-27

Mrs. Emma Yocum
Dr. M. G. Yocums
Wife (or) Widow
gave this to me
in Dr. (of)
Oct, 14, 1936.

The
Proportion of
Maltose and Dextrins
in
Mellin's Food
is that best suited to the
Carbohydrate needs
of
the infant