

# The Midwife.

## Percentage Feeding of Infants.

Laboratory feeding for infants is scientific, but it is within the reach of few; it necessitates a fairly elaborate plant, is expensive, and has not the educative value of home feeding. The problem of how the intelligent mother or nurse may modify cow's milk so that its exact composition is known is solved by an American method—percentage feeding. This is admirably and clearly explained in detail by Holt in his book on the Diseases of Infancy and Childhood. It is first of all necessary to know the percentage composition of human and cow's milk; these differ considerably, but the following table is based on the latest analyses.

	Human	Cow's
	Average.	Average.
Fat .....	4	4
Sugar .....	7	4½
Proteid (Casein and Lactalbumin) 1½	...	3½
Salts .....	½	¾
Water .....	87½	87½
	100	100

The fat is equal in cow's milk, the sugar is deficient, and the salts and proteids are in excess. As it reaches the consumer it is acid and contains micro-organisms, whereas human milk is alkaline, and practically sterile. The method of adding water in varying proportion aims at reducing the quantity of the proteids—the most necessary of all modifications—but the fact of the difference in the quality of the proteid in cow's milk is often ignored; it contains five times as much casein as lactalbumin, whereas human milk contains more lactalbumin than casein; this accounts for the difference in the character of the curd.

If water be added to cow's milk, the fat proportion is unduly reduced. This is usually compensated by the addition of cream. It is a common error among even well educated people to think that cream is the fat of milk; it is most accurately described as milk with an excess of fat; a good cream obtained by skimming usually contains about 20 per cent. of fat. The percentages of proteid and sugar are very little lower than in milk. In adding cream, therefore, proteid salts, and sugar are increased in the mixture. It would be a complicated matter for anyone to say exactly what the baby is really having. It is urged that he thrives upon it, but this method can only be described as haphazard, unscientific,

and empirical, whereas percentage feeding is approximately accurate, scientific, and adjustable to the varying needs of the individual infant.

The midwife and monthly nurse are chiefly concerned with the infant for the first few weeks of its life. This paper deals with the preparation of feeds by the percentage method for a normal baby during that period; but while the formulæ will be found for the most part suitable it cannot be too often reiterated that fixed rules for infant feeding are absurd and impracticable; the increase in the strength and quantity of the food must depend upon the individual baby; if he sleeps well, is satisfied, finishes his bottle with good appetite, does not vomit or regurgitate excessively, has normal stools, gains steadily in weight, he may be regarded as a model. Any departure from these conditions are indications that the baby and food are not in perfect harmony; careful and judicious increase or decrease in the percentages must then be made.

Human milk contains roughly three times as much fat as proteid. In modifying cow's milk this is the ratio desirable for the early months. This is obtainable by the following method:—Take a quart of fresh, clean milk, with a fat percentage of four. This latter point is important, as it is the basis of the calculations; the average of fat in mixed milks is four per cent., but the milk of Jersey cows often contains 5 to 5½ per cent. (The percentage of fat may be approximately determined by means of a cream gauge. The tube is filled with fresh milk up to the zero mark, corked, and left for 24 hours, the temperature of the room being about 65 degs. The percentage of cream is then read off; the ratio of this to the fat is about 5 to 3; thus five per cent. of cream indicates 3 per cent. of fat; 6½ per cent. of cream 4 per cent. of fat.) Stand the quart of milk for four hours; nearly all the fat will rise to the surface; take off the top third, preferably by means of a siphon, failing that a dipper or spoon may be used; this top milk will contain 10 per cent. of fat. If all the fat had risen it is simple to calculate that it would contain 12 per cent. of fat, the extra 8 per cent. being derived from the lower two-thirds; analysis, however, shows that it contains only 10 per cent. The amount of proteid in the top milk is almost as much as that in ordinary milk, i.e., 3½ per cent.; thus we have now ob-

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