

Hazards of scoop measurements in infant feeding

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SUMMARY. Mothers attending infant welfare clinics were asked to measure milk powder from a standard packet with the scoop provided by the manufacturers. Wide variations were found in the weight of powder obtained, with the highest scoop weight (5.6 g) being double the lowest (2.8 g). It is suggested that the scoop method of measuring milk powder is so inaccurate that the manufacturers should present their product in small pre-measured packets.

Introduction

THE use of dried powdered cow's milk in the artificial feeding of infants is accompanied by many well recognized difficulties and dangers, not only nutritional, but also immunological and bacteriological. One hazard, though easy to prevent and well documented,¹⁻³ has been neglected. This relates to the accuracy of the scoop method of measuring by which a standard amount of milk powder is measured in a small plastic cup, and mixed with a specified volume of water to give reconstituted milk of presumably the correct strength.

In watching patients prepare feeds in their homes, it became obvious to the author that very variable amounts of powder were scooped up, and the milk powder to water ratio varied considerably from one mother to another. This study aimed to determine the amount of variation.

Method

Two infant welfare clinics were visited in Chester, one situated in the centre of a large council estate, and the other in an area of mixed council and private housing. Mothers who were attending that day were given an opened packet of milk powder with the scoop provided by the manufacturers. Each mother was asked to scoop in exactly the same way as she did at home three times, the first two in the normal way, and the third as if she were in a hurry. After each mother's turn, the packet was shaken to ensure the milk powder had not become compressed. A knife for levelling was provided for those mothers who normally used one. The powder was measured to 0.01 g.

Results

Table 1 shows the wide variation in weight of powder obtained by the mothers. Those mothers who did not use a knife or finger to level the powder, but thought they were wiping the excess powder off by pulling the scoop up the inner side of the packet, consistently obtained higher weights of powder. They were in fact compressing the powder into the scoop and down the handle. One mother actually used the knife to press the powder into the scoop.

The heaviest weight of powder scooped (5.64 g) was double the smallest (2.75 g). The quantity scooped was unaffected by the depth from which it was obtained in the packet or whether levelled by the finger or the knife. Scooping in a hurry sometimes resulted in much more or much less powder being obtained. For

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Table 1. Mean weights of a scoop of milk powder for 19 mothers who used a knife or finger to level powder and nine mothers who did not.

	Number of scoops	Weight of powder (g)	
		Mean	Range
Levelled with knife or finger	57	3.55	(2.75-5.20)
Not levelled	27	4.51	(3.95-5.64)
Total	84	3.86	(2.75-5.64)

other mothers it made no difference. The main factor then in determining the quantity of powder obtained was the method of scooping — the force used and the compression applied. Rarely was less than a scoopful measured, and, especially with those who did not use a knife to level off, the scoop was generally overfilled.

Discussion

It is interesting to note that all the mothers said they had read the instructions on the packet, and all thought they were measuring correctly. The wide variation in amounts measured suggest, however, that, even having read the explicit instructions on the packet, few mothers obtain the correct amount of milk powder by the means provided. Loose powder and a scoop is therefore a very unsatisfactory commercial presentation. To make matters worse, some mothers said they add an extra scoop to 'satisfy' the baby. One mother was giving her infant eight scoops in five ounces of water.

The effects of feeding concentrated milk to infants must, at the least be undesirable and possibly harmful. With the over-concentration of the milk the infant would receive a huge excess of protein, immunologically foreign to it and without the protection of IgA normally present in breast milk, large excesses of carbohydrates and fats,³ and also of sodium, though this is not as great a problem with the newer milk formulae.

The solution to the problem is for the manufacturers to present the powdered milk not as loose powder and a scoop but as small pre-measured packets to be reconstituted with a measured amount of water to make milk of the correct strength. This idea, suggested as long ago as 1973,¹ would have the added benefit of improved sterility.

References

1. Wilkinson PW, Noble TC, Gray G, Spence O. Inaccuracies in measurement of dried milk powders. *Br Med J* 1973; 2: 15.
2. Smith BAM. Feeding overstrength cows' milk to babies. *Br Med J* 1974; 4: 471.
3. Oates RK. Infant feeding practices. *Br Med J* 1973; 2: 762.

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Symphysis—fundus charts: corrigendum

Symphysis—fundus charts (A4 size) are no longer available from Titan Press Ltd (February *Journal*, p.48). They can now be obtained from Trustmark, Merches Place, Grangetown, Cardiff CF1 7RD (Tel: 0222 221501).