Breast-feeding and weaning practices in Venda, 1990

E. ZÖLLNER, N. D. CARLIER

Abstract **A stratified random cluster survey, using a structured interview schedule, was performed to determine the prevalence, frequency and duration of breast-feeding among Venda mothers as well as the foods that Venda children commonly ate in their first 2 years of life. Nearly all children under 2 years old were being breast-fed and virtually all of these were fed on demand. Approximately 60% of infants under 3 months of age and virtually all others under 2 years old received supplementary foods daily. A further 30% of infants under the age of 3 months were given supplementary water daily. Forty per cent of infants under 3 months old and virtually all in the other age groups were given carbohydrates daily. Protein foods, vitamin/mineral and high-energy sources were given less frequently. Only 12% in the 6 - 11-month age group and 21% in the 12 - 23-month age group received a balanced diet daily. A significant proportion of children in all age groups received only carbohydrates over and above breast-milk. Traditional mixes were infrequently given. More research is needed to assess actual breast-milk production by mothers whose children are being fed supplementary foods. The effect of socio-economic status on weaning practices and that of weaning practices on nutritional status need to be investigated. Food supplementation and nutrition education programmes need to be intensified.**

S Afr Med J 1993; **83:** 580-583.

Venda is a small but fertile homeland of about half a million inhabitants, situated in the north-eastern corner of the Transvaal. Most Vendas live in rural villages. Their income is derived from migratory labour, and supplemented by subsistence farming.[1]

In 1985/86 an unpublished nutrition survey by the Regional Health Organisation of Southern Africa (RHOSA) revealed that Venda had the highest proportion of underweight children under the age of 5 years of all the areas surveyed (16% compared with 8% in South Africa). Protein energy malnutrition (PEM) was most prevalent in the 1 - 2-year age group (24%), although a significant proportion (12%) of those under 1 year old was found to be malnourished. A hospital-based study, performed in 1988, revealed that approximately a quarter of all infants under 6 months of age presented with PEM, while the corresponding figure for 7 - 12-month-old and 13 - 24-month-old children was 40%.[2] This finding could be explained only in part by low-birth-weight babies who had not regained normal weight at the time of the survey. It may well reflect poor breast-feeding and weaning practices, which compound the disadvantages of deprived socio-economic circumstances (Venda's personal per capita income was R52 — the lowest of the TBVC states). This observation has also been made in other parts of the world, e.g. in Gambia.[3] This prompted us to investigate breast-feeding and weaning practices in Venda.

The objectives of the study were to determine the prevalence, frequency and duration of breast-feeding, as well as the foods Venda children were most commonly fed in their first 2 years of life during the dry season, 1990.

Definitions

Children under 2 were all 23 months of age or younger at the time of the survey.

Weaning denotes a 'gradual withdrawal of breast-milk and introduction of other foods', including water, fruit juice and milk other than breast-milk.[4]

Supplementary foods are all foods, whether liquid, solid or semi-solid, other than breast-milk (excluding water).

A balanced diet consists of at least one 'carbohydrate food', at least one 'protein food', at least one 'vitamin/mineral source' and a 'high-energy source', excluding breast-milk.[5]

A 'carbohydrate food' is a low-density calorie food.

A 'protein food' is a food that is a good source of protein.

A 'vitamin/mineral source' is a term used collectively for all vegetables and fruit.

A 'high-energy source' is a high-density calorie food, i.e. all oils and fats.

A traditional mix, as used in Venda, usually consists of maize or a vegetable mixed with peanuts (usually ground), i.e. 'tshigume', 'tshidzimba', 'tshidamba', 'tophi', 'dovhi'.

Subjects

The sampling method used was based on Kok's modification of the WHO-EPI vaccination coverage survey methodology.[6] In each of 45 randomly selected clusters in Venda, 2 children under 2 were selected from each of the following 4 age groups: 0 - 2 months, 3 - 5 months, 6 - 11 months and 12 - 23 months, i.e. 360 in all. If a household had more than 1 eligible child, e.g. in the case of twins, only 1 was selected by means of a coin toss. If household members refused to co-operate with the survey, another child of the same age group was selected in that cluster. The household was revisited if no one had been home at the time of the first visit. The age of each child was determined from the Road-to-Health chart.

Methods

A structured interview schedule with closed and open-ended questions was used. The person responsible for feeding the child (usually the mother) was interviewed. If this person was not available another person in the household, usually the grandmother (who traditionally looks after young children when the mother is not at home), was interviewed. She was asked whether the child was being breast-fed at the time or, if not, what the duration of breast-feeding had been. A qualitative dietary evaluation was performed: for each item on a list

Tshilidzini Hospital, Venda and Red Cross War Memorial Children's Hospital, Cape Town
E. ZÖLLNER, M.B. CH.B., D.C.H. (S.A.), D.T.M. & H., D.P.H.
Donald Fraser Hospital, Sibasa, Venda
N. CARLIER, M.B. B.S., M.P.H., F.R.A.C.G.P. (Present address: Box 170, Ceduna, Australia)

Accepted 4 Jan 1993.

of 50 different foods, the mother had to indicate whether the child had ever eaten that food and if so, how frequently (Tables I-III). For logistical reasons portion size was not established and dietary calculations were not performed. Each food was included in only 1 food category (e.g. milk was classified as a protein food).

TABLE I.
Frequency of intake of different carbohydrates daily by age group (percentage of total per age group)

	Age group (mo.)			
Type of food	0 - 2	3 - 5	6 - 11	12 - 23
Cereal (grouped)*	35,6	95,2	100,0	100,0
Bread (brown)†	1,1	—	57,3	70,9
Potato	—	2,4	41,6	5,6
Sweet potato	—	—	31,4	2,2
Rice	—	—	10,1	—
Pasta	—	—	12,3	—
'Empty calories'‡	—	—	29,2	2,2
Jam, syrup, honey	—	—	7,9	9,0
Sugar	7,7	14,3	41,6	62,4

*Comprises 5 different maize porridges of different textures with or without added herbs as well as commercial cereal and, in the case of 1 patient, oats porridge.
† No white bread was eaten.
‡ Puddings/biscuits/rusks/chips/sweets/chocolates.

TABLE II.
Frequency of intake of different protein foods daily by age group (percentage of total per age group)

	Age group (mo.)			
Type of food	0 - 2	3 - 5	6 - 11	12 - 23
Milk (grouped)*	21,1	31,0	30,0	27,0
Eggs	—	7,1	46,1	23,5
Chicken	—	1,2	23,6	—
Peanut butter	—	3,6	20,2	20,0
Liver	—	—	20,2	—
Fish	—	—	18,0	—
Legumes	—	—	18,0	—
Nuts	—	—	16,9	1,2
Non-dairy creamers†	—	—	5,6	4,7
Traditional protein sources‡	1,1	—	3,4	2,4
Internal organs	—	—	3,4	2,4
Meat	—	1,2	—	3,5

* The most common types of milk used were highly modified, modified and partially modified milk formulas. Other milks used were fresh cow's milk, condensed milk, soya milk and Ultramel. Skimmed milk was not used.
† Not strictly a protein food, but included here for purposes of comparison.
‡ Insects, hairy caterpillars.

TABLE III.
Frequency of intake of other foods daily by age group (percentage of total per age group)

	Age group (mo.)			
Type of food	0 - 2	3 - 5	6 - 11	12 - 23
Water/cooldrink*	66,7	69,0	85,4	64,7
Citrus fruit/juice	2,2	49,4	86,5	25,9
Other fruit/juice†	—	20,2	49,4	17,6
Spinach	—	—	32,6	9,0
Other vegetables‡	—	—	27,0	9,0
Oil/margarine§	4,4	3,6	22,5	45,9
Soup/gravy	—	—	28,0	23,6
Tea/coffee	1,1	1,2	11,2	17,6
Traditional mixes (grouped)	—	—	4,5	11,8

*Cooldrink was rarely given; more common in the older age groups.
† Banana, avocado, pawpaw, apple, guava.
‡ The five most common vegetables were cabbage, 'delele' (wild vegetable), tomato, 'mutshaeni' (form of spinach), onion.
§ No butter or fat was used.

Permission was obtained from the relevant authorities. Community co-operation was sought before the commencement of the survey. The questionnaire was piloted several times. Three pairs of nurses administered the questionnaires. Each pair visited approximately one-third of the clusters in the survey. The majority of interviews (82%) were conducted by female nurses. The survey, which started at the end of August 1990, took approximately 8 weeks to complete. Seven interviews were repeated by another interviewer on a separate visit to test reliability. The analysis was done by means of the Epi Info 5 statistical package.

Limitations of the survey

1. Although a reliability test was performed, the sample retested was too small to permit many conclusions. However, our impression is that information on foods given weekly or monthly was less reliable than information on foods given daily. The information as to how often a specific food was given each day was also assessed as unreliable. These data were therefore not analysed separately.

2. As with any survey of this kind, it was difficult to assess validity. It was not possible to observe families preparing meals or feeding their children. It is possible that some women exaggerated the variety of foods they fed their children. Observation of Venda custom, however, confirms that this survey is certainly valid for commonly used foods, e.g. cereals, bread.

3. The survey was performed at the end of the dry season. This may have reduced the availability of some foods, especially wild and home-grown vegetables and fruit; the study would therefore reflect a worse situation than may pertain at other times of the year.

Results

Altogether 359 children under 2 were sampled. During the survey 4 had to be excluded and replaced (as they fell into the wrong age group). Eleven children had to be excluded from the analysis for various reasons. Three hundred and forty-eight children or 97% of the sample were analysed (Table IV).

TABLE IV.
Age groups analysed in weaning survey

Age group (mo.)	No.
0 - 2	90
3 - 5	84
6 - 11	89
12 - 23	85
Total	348

As shown in Fig. 1, virtually all children under 2 were being breast-fed at the time of the survey. In the 12 - 23-month age group this figure dropped to approximately 80%. The mean duration of breast-feeding of those who had stopped in that age group was 11 months. Nearly all the children were being breast-fed on demand (between 91% and 97% depending on age group). Of the remaining breast-feeders, the mean frequency was 3 times a day (range 1 - 10). Only 2 infants under 3 months of age were not breast-fed. Both babies were being fed on demand with a highly modified breast-milk substitute.

Fifty-eight per cent of infants under 3 months old and virtually all in the other three age groups were being fed supplementary foods daily (Fig. 1). A further 30% of infants under 3 months were given water daily in addition to being breast-fed.

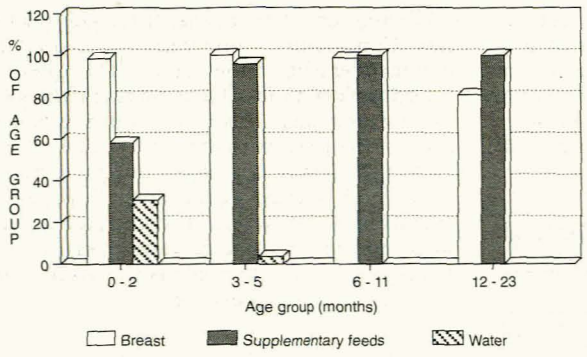

FIG. 1.
Daily breast-feeding and daily supplementary feeding.

Forty per cent of infants under 3 months of age were given carbohydrates on a daily basis (Fig. 2). This figure increased to 95% in the 3 - 5-month age group and to a maximum of 100% in the other two age groups, with virtually all children on maize porridge. Similarly, with increasing age the proportion of children under 2 on daily protein foods increased, starting at 23% and reaching a maximum of 61% in the 12 - 23-month age group. The most common protein food was milk, which accounted for 20 - 30% of all foods given. Daily vitamin/mineral sources and daily high energy sources showed a similar pattern with a maximum of 49% and 46% respectively in the 12 - 23-month group.

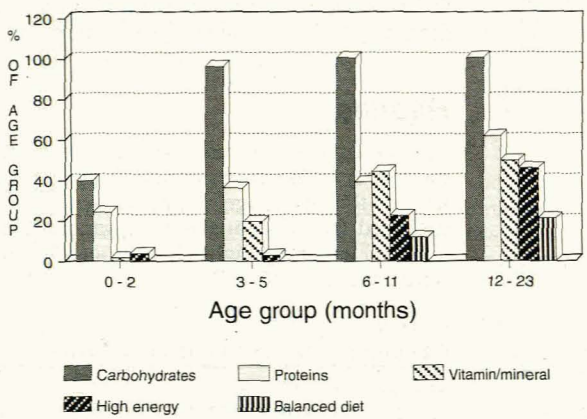

FIG. 2.
Food group, by age group.

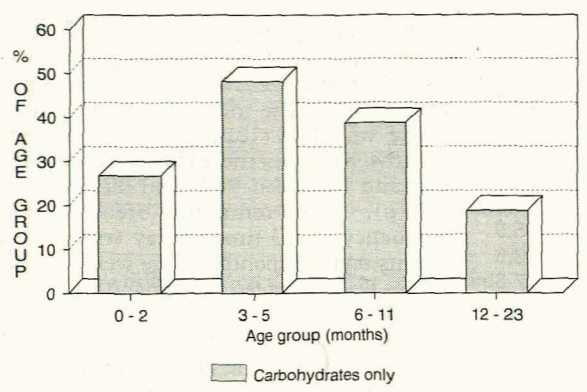

FIG. 3.
Carbohydrates only, by age group.

Only 12% in the 6 - 11-month age group and 21% in the 12 - 23-month age group received a balanced diet daily at the time of the survey (Fig. 2). As shown in Fig. 3, many children in each age group were fed on carbohydrates only (not counting breast-milk). This figure was highest in the 3 - 5-month age group (49%) and lowest in the 12 - 23-month age group (19%).

Traditional mixes, with one exception, were not given to children in the first two age groups (Fig. 4). Twenty-four per cent of infants in the 6 - 11-month age group received traditional mixes. These were given most commonly in the 12 - 23-month age group (68%). However, only 5% and 12% respectively received them on a daily basis.

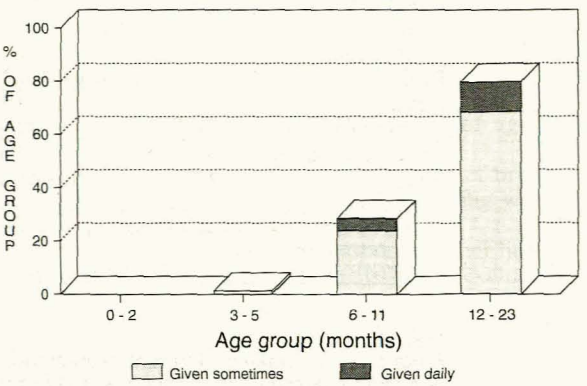

FIG. 4.
Traditional mixes, by age group.

Discussion

Virtually all the children investigated were being breast-fed. This compares favourably with breast-feeding practices in Sudan, where only 24% of rural Sudanese children were being breast-fed at the end of their second year.[7] Closer to home in Gelukspan, 75% of 12 - 17-month-old and 47% of 18 - 23-month-old children were being breast-fed.[8] Breast-feeding patterns in the Western world differ. In Denmark only 10% of mothers were breast-feeding their infants at 1 year.[9] In all the areas mentioned, virtually all children under 3 months of age were being breast-fed (Denmark had the lowest proportion with 94%). Venda mothers traditionally breast-feed for long periods. The breast-feeding guidelines laid down by the Venda Department of Health, UNESCO and the WHO are thus automatically enforced by tradition.[10]

Nearly all children under 2 were being fed on demand. This was also the rule in Sudan.[7] Apart from being a traditional practice, demand feeding has a distinct advantage over schedule feeding. Demand-fed infants suckle more frequently than infants fed according to schedule.[5] This stimulates breast-milk production. Provided that mothers of suckling infants are not undernourished, their increased milk production should result in adequate growth of their offspring.

Fifty-eight per cent of infants under 3 months of age were on supplementary foods. Another 30% in the same age group were on supplementary water. By contrast, in Sudan only 9% and in Gelukspan only 11% had begun to be weaned before the age of 3 months. In Malawi this figure was higher at 21%.[11] Early introduction of supplementary foods causes a decreased frequency of suckling.[5] Theoretically, a decreased supply and intake of breast-milk would therefore be the consequence. This will become more apparent with time, as the child is introduced to more and more foods. Anecdotal evidence

indeed suggests that in many instances the breast functions as a pacifier only. This theory, however, needs to be assessed scientifically.

Early weaning (i.e. before the age of 3 months) also has many other dangers, i.e. aspiration of a feed, infection due to contamination and the development of allergy from the introduction of foreign proteins. Nutritionally, early weaning is not a problem provided the child is weaned onto a balanced diet. In developed countries this is available in the form of commercially prepared weaning foods which follow the guidelines of the Codex Alimentarius Commission of the WHO/FAO.[4] However, in a developing country, such as Venda, these foods are often unaffordable and not readily available. Only a small proportion (3,5 - 9% depending on age group) of Venda children under 2 were given a commercially prepared weaning food daily. Because these are so expensive, Cameron and Hofvander[5] have proposed a home-made multimix. It consists of four basic ingredients: a staple (usually a cereal), a protein source, a vitamin and mineral source (fruit or vegetable) and an energy source (fat, oil or sugar). Traditional mixes in Venda conform closely to these requirements. However, they do not form part of a Venda child's typical weaning diet as can be seen from this study (Fig. 4). Our observation is that many Venda mothers are reluctant to mix certain kinds of food. We were therefore interested to see what proportion of Venda children under 2 were receiving a balanced diet without the ingredients being mixed. No child under 6 months of age was receiving a balanced diet daily. For a child weaned between the ages of 4 months and 6 months, as is normally recommended, this would be acceptable.[4,5,10,12,13] However, if weaning starts at birth (as in 88% of under-3-month-old Venda infants), all food types should be introduced earlier in order to make up for the loss of 'balanced diet' in the form of breast-milk. The highest proportion of children receiving a balanced diet daily was 21% in the 12 - 23-month age group. This study shows that early weaning is common and that it is not usually accompanied by the introduction of a balanced weaning diet. It is conceivable that failure to thrive (FTT) and overt PEM can develop under these circumstances. A study in Gambia has shown that there was indeed 'an overall tendency for subsequent growth in weight to be adversely affected in children who began to be weaned before 3 months'.[3] A community-based case control study therefore needs to be performed to look at the effect breast-feeding and weaning practices have on the nutritional status of Venda children.

It has been estimated that approximately 80% of Venda's population live below the poverty datum line.[14,15] The fact that 79% of 12 - 23-month-old Venda children are not on a balanced diet may well be a reflection of such poverty. However, data on socio-economic status and nutrition knowledge of Venda mothers have not been collected in this study. Further research is needed.

The proportion of children fed on carbohydrates only is highest in the 3 - 5-month age group (49%) and drops thereafter. This is a reflection of the current weaning process in Venda. Virtually all the children are on supplementary feeding in this age group (Fig. 1). Mothers are usually taught to introduce cereals first.[12,16] This advice is followed closely in Venda (95% of children in this age group are on cereals). Other types of food are introduced after cereals. The proportion of children fed on carbohydrates only therefore drops in the older children (Fig. 3). However, it is unfortunate that 19% of 12 - 23-month-old children are still being fed carbohydrates only.

There are two possible reasons for the observed weaning pattern — poverty and lack of knowledge. Given the dire poverty of most of the population of Venda, every effort should be made to uplift them economically. The limited food supplementation that has been initiated should be extended to all children at risk.[17] More attention needs to be paid to nutrition education, and the importance of a balanced diet must be emphasised. Further aspects of nutrition intervention have been discussed elsewhere.[17]

We would like to thank Dr M. Bac for providing the Gelukspan questionnaire, which we adapted and modified to local circumstances. We thank Dr D. Yach and others at the SAMRC, as well as Mrs A. van Middelkoop from the Department of National Health and Population Development, for their help. The following nurses walked many kilometres and without them the survey could never have been conducted: A. A. Dzialwa, C. Davhana, M. Ntsandeni, R. Moshapo, E. Muelelwa, M. B. Maumela, V. E. Maphaha. Their help is greatly appreciated. We thank Martin Staudt, Ursula Schloh, Marion Schmidt and Kerstin Dauth for data entry, Medical Informatics of Red Cross Hospital for drawing the graphs and all others who contributed in any way. Finally, we would like to thank Dr J. McCutcheon of the Department of Health (Venda) for permission to publish and Mrs A. Leu for typing the manuscript.

REFERENCES

1. McCutcheon IP, Carlier ND. Primary health care in Venda — policy and strategy. *S Afr J Cont Med Educ* 1989; **7:** 1369-1377.
2. Zöllner E, Gear I, Maritz G, *et al.* Protein energy malnutrition and its recognition in outpatient departments in Venda Hospitals. *S Afr Med J* 1992; **81:** 210-212.
3. Rowland MGM. The weanling's dilemma: are we making progress? *Acta Paediatr Scand Suppl* 1986; **323:** 33-42.
4. Wharton B. Weaning and child health. *Annu Rev Nutr* 1989; **9:** 377-394.
5. Cameron M, Hofvander Y. *Manual on Feeding Infants and Young Children.* Oxford: Oxford University Press, 1983: 117-118.
6. Kok PW. Cluster sampling for immunization coverage. *Soc Sci Med* 1986; **22:** 781-783.
7. Omer MIA, Suliman GI, Mohamed KA, *et al.* Breastfeeding and weaning in the Sudan. Contemporary patterns and influencing factors. *J Trop Pediatr* 1987; **33:** suppl, 1-12.
8. Den Besten L. *Weaning Practices in the Gelukspan Health Ward, Bophuthatswana, June 1988.* Den Haag, Netherlands: Department of Nutrition and Dietetics Haagse Hogeschool.
9. Weile B, Rubin DH, Krasilnikoff PA, Kuo HS, Jekel IF. Infant feeding problems during the first year of life in Denmark: factors associated with the discontinuation of breastfeeding. *J Clin Epidemiol* 1990; **43**(12): 1305-1311.
10. *Facts for Life. A Communication Challenge.* UNICEF, WHO, UNESCO. Benson, Oxfordshire: P & LA.
11. West KP, Chirambo M, Katz I, Sommer A (Malawi Survey Group). Breastfeeding, weaning patterns, and the risk of xerophthalmia in southern Malawi. *Am J Clin Nutr* 1986; **44:** 690-697.
12. Department of Health and Welfare. *The Basis of Infant and Toddler Feeding.* Pretoria: Government Printer.
13. Cooke R, McDonald MA. *The Scientific Basis of Breastfeeding.* 1st ed. Cape Town: Institute of Child Health. University of Cape Town, 1979.
14. Wilson F, Mamphela R. *Uprooting Poverty. The South African Challenge.* Cape Town: Creda Press, 1989: 17.
15. Van Deventer WV. *Poverty and a Practical Ministry of Liberation and Development Within the Context of the Traditional Venda Concept of Man.* Unpublished, Masters Thesis, University of the North, 1990: 4-6.
16. King M, King F, Morley D, Burgess L, Burgess A. *Nutrition for Developing Countries.* Nairobi: Oxford University Press, 1980.
17. Zöllner E. Nutrition intervention in Venda — a proposed system of active case finding and food supplementation. *S Afr J Fam Pract* 1991; **12**(3): 93-98.