

Weaning practices in rural and urban Vava'u, Tonga Island

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Introduction

Nutritional studies that have been conducted in Tonga in the past years have presented an incomplete picture of the feeding or weaning practices. In 1952, Langley described feeding practices of three infants.¹ Thirty years later, studies of the nutritional status of children between zero and five years old in both rural and urban areas^{2,3} concluded that rural children were nutritionally better off than their urban counterparts. At about the same time in 1983, Engleberger⁴ determined weight for age value for 273 children between one and two years old, and reported that four and eight percent of these infants were malnourished respectively.

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The weaning period, when breast feeding is replaced with other foods, is most critical in an infant's life in terms of vulnerability to malnutrition⁵. The vulnerability of infants to malnutrition is attributed to three main conditions. First, the mothers' breast milk alone is insufficient to meet the nutritional requirements of the child after 6 months and so supplementation is required. Second, the foods chosen by mothers may not be nutritionally adequate. Third, the weaning process may be abrupt or introduced more rapidly than is normally recommended. Contributing factors to the risk during weaning includes customs, beliefs or taboos, socio-economic status, size of the family, and the level of parents' education, especially that of the mother.

This study determined the weaning practices in Vava'u, Tonga Island. The study examined the following hypotheses:

- weaning foods in rural areas consist of traditional foods whereas in urban areas they consist of non-traditional food products; and
- supplementation begins earlier in life for infants of wage earning mothers.

Background information about the study areas

Vava'u is one of the major groups of the islands in Tonga. The three study areas were:

Ovaka

This is the most remote inhabited island of the Vava'u group. Travel to and from this island is mostly by small outboard motor boats and canoes. There is only one village on this island with a population of 180 individuals of which, three were infants aged between 7 and 8 months. However, only two of these infants were included in the present study. Cassava is the main food on the island. Some farmers go to other nearby islands to plant the other crops they need. There was one shop on the island selling the most frequently used goods (kerosene, sugar, flour, tinned meat, etc.) Milk formulae, cereals, sweet biscuits and other processed food products were not available because the people bought these items from Neiafu, the capital town of Vava'u. There is no health centre on the island. Thus, medical attention was sought from a nearby clinic in the island of Falevai or from Neiafu. A nurse visits Ovaka on a monthly basis depending on the weather conditions and transport availability.

Leimatu'a

This is one of the biggest villages on the main island of the Vava'u group. It is about 16 kilometres from Neiafu the main town. The only airport for Vava'u is at the outskirts of the village of Leimatu'a. The villagers have more gardens than the residents of Neiafu. The villagers are also engaged in vanilla cash cropping. Leimatu'a (population 1,500) is linked to Neiafu by a regular bus service.

There are 6 shops in the village. These sell practically the same products as found in Neiafu, namely, hard biscuits, flour, sugar, tinned meat, toiletries, cigarettes, tea etc. Baby foods and milk formulae were not sold in these shops, the reason being that the shop owners found the latter products too expensive to buy in bulk, and customers can buy them cheaper from Neiafu. There is no health centre in Leimatu'a but a staff nurse visits the village at least once a month. Other health complaints are referred directly to the main hospital in Neiafu.

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Neiafu

Neiafu is the main town. It is the centre for all commercial and government departments. The main hospital (Ngu Hospital) is in Neiafu. It has 61 beds. In different parts of the town nurses meet with the mothers and children for growth monitoring and immunisations.

There are five large shops in the town centre and approximately fifteen small-size retail shops spread throughout the town. Cargo and passenger boats visit Vava'u frequently. These bring the goods for the shops. The main local food market is also in Neiafu. Farmers bring and sell their produce here. Fresh and frozen fish could be bought from fishermen or the market. A few homes have small vegetable gardens in their yards. Neiafu residents mostly travel out of town to plant their crops. Some rely mainly on the food supply available at the local food market.

Method

The birth data for this study were collected from the Justice Department in Neiafu. It was originally planned to collect the records of child birth from the hospital. However, the nurse in charge of the children and mothers section advised that the hospital records were inaccurate, especially for babies not born in the hospital. This was confirmed by the clerk at the Justice Department. All the babies born December 1985 to December 1986 in Ovaka, Leimatu'a and Neiafu were included in the study.

A questionnaire was administered by three interviewers to mothers or an adult female member of the family. The questionnaire was in the Tongan language. It covered the weaning practices and infant's health. Mothers were asked to indicate the weaning food that had been used for their children. Height measurements were taken using two pieces of flat wood placed at the end of the head and feet. The distance between these pieces of wood was measured using a tailors measuring tape. The weight was measured using a Detecto beam balance.

The above measurements were analysed using the WHO Anthropometric Reference Values⁶ (weight for height, weight for age and height for age) to determine the nutritional status. The values within two standard deviations (2SD) above or below the median were regarded as normal. The values more than 2SD from the median were regarded as high. Low were the values 2 SD below the median. The WHO standards were used to interpret the weight height and age ratios.⁵

Results

Fifty four babies were studied, 27 males and 27 females (Table 1). The average of the current age of the mothers in Neiafu and Ovaka were thirty years and 28 years for the mothers at Leimatu'a. The age range of the mothers at the birth of their first child was 17-28 years (average 23) for

Village/ Island	Sector	Male	Female
Ovaka	rural	2	0
Leimatu'a	semi-urban	12	10
Neiafu	urban	13	17

Leimatu'a and 17-32 years (average 24) for Neiafu.

The employed mothers in the study were all from Neiafu. These employed mothers were on the average twenty-seven (27) years and had weaned their babies at the age of three months.

The rest of the mothers, not in paid employment from the three study areas had an average age of thirty (30) years. They had weaned their babies at the age of four months (see Table 2). The rest of the babies not completely weaned were still being breastfeed and had also been receiving supplementary feeds.

The fathers from Ovaka, Leimatu'a and Neiafu averaged 30, 29 and 33 years of age respectively. Both the fathers in Ovaka and 90% of the fathers in Leimatu'a were farmers. In Neiafu, 67% of the fathers were employed. The rest of the men (23%) relied on cash crops for their income. In addition, half of the employed men had food gardens.

Weaning foods

In general six categories of foods were used for weaning. Table 3 shows the categories of weaning foods as well as the

Age groups	Number of infants	Number of children completely weaned
<i>Ovaka</i>		
7 - 9 months	2	0
<i>Leimatu'a</i>		
0 - 3 months	1	1
4 - 6 months	6	2
7 - 9 months	7	4
10 - 12 months	8	8
<i>Neiafu</i>		
0 - 3 months	1	0
4 - 6 months	8	2
7 - 9 months	8	5
10 - 12 months	13	3

Food category	Rural	Urban	Total
Root / Tree crops	18	18	36
Meat, poultry, fish	3	3	6
Cereals	5	9	14
Flour products	11	10	21
Fruits/ vegetable	11	9	20
Milk/ Milk formulae	6	7	13

Note: Ovaka has been combined with Leimatu'a because of small numbers

number of mothers who claimed to have used them. Because of small numbers, the Ovaka and Leimatu'a data were combined to rural and Neiafu categorised as urban.

Nutritional status and health records of the infants

The determination and interpretation of their nutritional status were based on the WHO Anthropometric Reference value ⁶. (See Table 4).

Table 5 shows the general appearance, health records (as reported by the mothers) and the nutritional status of all the babies who had shown symptoms of ill health during the survey. Table 6 shows the characteristics of the infants that had normal nutritional status and the frequency of use of different types of weaning foods.

Interpretation of nutritional status	Rural	Urban	Total
Normal	15	17	32
Tall, normal nourished	5	0	5
Currently underfed	2	4	6
Currently overfed with past history of malnutrition	0	3	3
Overfed but not necessarily obese	2	3	5
Total	24	27	51

** Three infants from Neiafu did not have all the information needed so they are not included in this table.*

Baby	Appearance at the time of the survey	Health status (as reported by the mother)	Nutritional Status
A	Big eyes but very active	Had very high fever when she was younger	Normal
B	Thin and pale	Slight flu and cough	Currently underfed
C	Thin	Lack of appetite repeated diarrhoea	Currently underfed
D	Thin	No appetite	Normal
E	Slight flu	Had pneumonia when young	Normal
F	Pale but fat	Very sick at the age of 4 months. Anaemic. Lack of appetite	Normal
G	Slight flu	Solids were introduced at the age of 2 months	Currently overfed with past history of malnutrition
H	Skinny and had sores	Pneumonia at the ages of 6 months	Normal
I	Sores	Weaned at birth (adopted)	Normal

*Note: Five cases (A - F) were the ones reported from the rural area
Three cases (G - I) were the ones reported from the urban area*

Discussion

The weaning process seems to begin earlier for wage earning mothers. All the mothers in this category were from Neiafu and the supplementary foods were given to their babies at the age of three months compared to four months for the babies of non-working mothers. However the rural children were completely weaned much earlier than those from urban Neiafu. Breast feeding tends to be more prolonged in Neiafu. The most frequent reason for a mothers choice of a weaning food was availability. Other reasons like nutrition and advice from someone came second and third respectively. Premastication of food was the predominant method used to prepare the baby's food. An alternative method used involved the mashing of food in a little bit of the stock left over from cooking.

Some mothers had reported that they wished they had used some other foods for weaning but were not able to do so. For instance, the mothers at Ovaka had wished for a variety of vegetables. Some mothers from Leimatu'a wished to feed their babies on biscuits, tinned baby foods and fish. Money was the main constraint in getting the food

Table 6: Characteristics of babies and the frequency of food types used for weaning in the nutrition 'Normal' group

Characteristics	Rural	Urban
Average age of the babies (months)	8	9
Average age when solids were introduced (months)	4	4
Average age of babies not weaned at the time (months)	7	8
Average age of babies completely weaned at the time (months)	6	4.6
Types of foods used in the weaning process:	<i>Total number n=20</i>	<i>Total number n=14</i>
<i>Root/Tree crops</i>	13	11
<i>Meat/Poultry, Fish</i>	3	1
<i>Cereals</i>	4	5
<i>Flour products</i>	7	5
<i>Fruits/Vegetables</i>	11	4
<i>Milk /Milk formulae</i>	5	6

they had desired for. Only one mother from Neiafu had wished her baby was fed on more local food especially kumara and yam.

The use of root/tree crops for weaning predominate in both areas. The usual practice was to roast half ripe plantains (big bananas), breadfruit or young yams. The mother or an adult woman in the family pre-masticated these before feeding the baby. The feed portions were usually just as much as the tip of the index finger can take. At the early stages of introduction of solids, the root of the tree crop was chewed alone. Other food stuffs like meat, fish, chicken, pele and taro leaves were added a little later when the baby was able to chew. Flour products were becoming important weaning foods for both urban and rural areas. These were mainly in the form of bread, biscuits and dumplings. White flour was perceived as a convenient food because it can be easily be stored and prepared in the home. Fruits such as bananas and papaws were used more in the rural areas than in Neiafu.

Milk formulae were used by some mothers in both areas. However, there were more varieties of milk formulae used in Neiafu. Only one variety was used in the rural areas. Milo was frequently reported from Leimatu'a as being used in place of milk formulae for bottle feeding. In 1958, Spillus⁷ reported that artificial feeding was high in Nuku'alofa. She believed that it was mainly due to the ability to get powdered milk rather than any emotional factor or urbani-

sation. This suggests that a very high price on milk substitutes will decrease their use.

The infants in the normal group (see Table 6) had solids introduced at approximately fourth months of age, with prolonged breast feeding and with a variety of foods used in the weaning process. The normal group of children in Neiafu were completely weaned earlier than their rural counterparts. The latter seemed to be better off in the variety of food selections used in the weaning process. Two factors that may have contributed to this were: the high income received from vanilla and the bush allotment for gardens were close to the homes. The results discussed above suggest that children who were introduced to solids much earlier than four months and were also completely weaned at about the same time were more prone to nutritional problems. The children who were completely weaned earlier but were shown to have had a fairly balanced selection of food for weaning were better of nutritionally than the group above. Perhaps a contributing factor to this is the use of milk formulae to supplement the breast milk. If the children who were introduced to solids at about four months old and were still breastfed for longer periods they seemed to be better off nutritionally.

Conclusion

This study has generally supported the hypotheses it set out to test. It has indicated that the infants in the urban area of Vava'u (Neiafu) are more vulnerable to nutritional problems. This has been brought about by combination of several factors such as a low income, increased dependency on imported products, unavailability of traditional food products, lack of a food garden and other social factors such as illegitimacy or adoption.

Some of the traditional weaning practices still prevail such as the pre-mastication of food and prolonged breast feeding. However the choices of weaning foods were often limited to carbohydrate rich diets. Generally a good proportion of the rural dwellers in Vava'u were receiving good income from vanilla sales and with the increased interactions between the rural sector and the urban area, the rural dwellers are bound to be influenced by some of the weaning practices of the urban dwellers. Consequently, there should be more nutritional programs to emphasise the advantage of the use of a variety of traditional food products in the weaning process.

High income seemed generally to be inversely related with the usage of traditional food? There is still a possibility that people in Vava'u can be convinced through nutritional programs to grow and eat the right type of foods. The importation of non-traditional foods will probably increase in Vava'u in the coming years. This is why there should be more nutritional programs in Tonga to promote the usage of a variety of traditional products in the weaning of children. These programs should aim at motivating the

urban dwellers to grow such foods around their homes and encourage rural dwellers to keep gardening.^{8,9}

There is a synergistic relationship between malnutrition and infection. Therefore, children need a good solid nutritional foundation early in life. Since children at very early ages have no real choice of what they are fed on, it should be the concern of parents, guardians and development planners as a whole.¹⁰ We need to bank on these children for a more fruitful and brighter future.

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