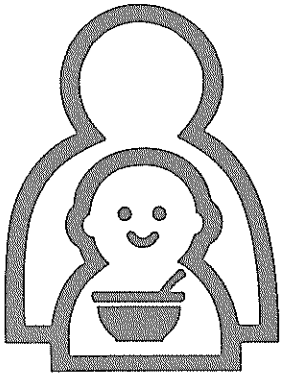
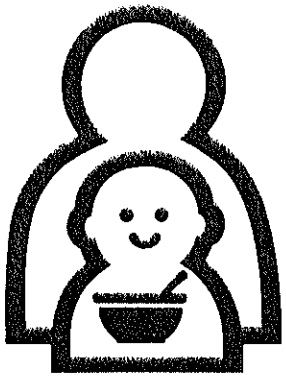


THE WEANING PROJECT

IMPROVING YOUNG CHILD FEEDING PRACTICES IN SWAZILAND: PROJECT OVERVIEW

MANOFF GROUP INC.



THE WEANING PROJECT

IMPROVING YOUNG CHILD FEEDING PRACTICES IN SWAZILAND: PROJECT OVERVIEW

Swaziland National Nutrition Council
and
The Manoff Group

1992

Under contract number: DAN-1010-C-4102-00
Agency for International Development
Bureau for Science and Technology/Office of Nutrition
and the Africa Bureau

MANOFF GROUP INC.

AUTHORS: Marcia Griffiths and Juliet Aphane

ORGANIZATIONS AND PERSONNEL

Project Management Group/Board of Directors (inter-Ministerial)

Juliet Aphane, Project Research Director, and later, Project Director, MOAC
Nomakhosi Mlambo, Project Coordinator (initial phase), MOAC
Lena Nilsson, Nutrition Advisor, UNICEF
Thoko Sibiya, University of Swaziland, President of SNAN
Dr. Qhing Qhing Dlamini, Deputy Director, Public Health Unit, MOH
Christabel Motsa, Head, Home Economics, MOAC
Angela Mbuli, Project Coordinator for UNICEF (later phase)
Marcia Griffiths, Director, The Weaning Project, The Manoff Group

Project Research Team (in addition to Ms. Aphane, Ms. Mlambo, and Mrs. Nilsson)

Lombuso Nxumalo, Health Education Unit, MOH
Thandi Mndzebele, Public Health Nurse, MOH
Mapule Masuku, Public Health Nurse, MOH
Zake Hlanze, Sociologist, MOAC
Zanele Mpama, Public Health Nutritionist , MOH
Nyamile Manana, Project Administrative Assistant, UNICEF

Ministry of Agriculture and Cooperatives (MOAC)

Frank Buckham, Deputy Principal Secretary
Robert Twala, Under Secretary
Magalela Ngwenya, Chief Projects Coordinator and Chairperson NNC
Cristabel Motsa, Head of Home Economics
Peter Dlamini, Audiovisual Unit
Nenekazi Zwane, Home Economics Section

Ministry of Health (MOH)

Dr. James J. Thuku, Director of Health Services
Dr. Qhing Qhing Dlamini, Director, Public Health Unit
Dr. Rhodes C. Mwaikambo, Medical Officer, Public Health Unit
Matron Edith Ntiwane, Public Health Unit
Pitnera Methembu, Health Education Unit
Elizabeth Mndzebele, PHC Program Matron
Thandi Dlamini, Head of Public Health Nursing
Dr. Tentile Shulubane, Director, Diarrhoea Treatment and Training Center

Lombuso Nxumalo, Health Education Unit,
Thandi Mndzebele, Public Health Nurse
Mapule Masuku, Public Health Nurse

USAID

Dr. Charles DeBose, Regional Health/Population Development Officer
Alan Foose, Regional Population Development Officer
Mary Pat Selvaggio, Regional Population and Nutrition Officer

UNICEF

Mark Stirling, Senior Programme Officer (initial phase)
Rodney Phillips, Senior Programme Officer (later phase)
Lena Nilsson, UNICEF Nutrition Advisor
Angela Mbuli, Project Coordinator

Swaziland Broadcasting Service/Center for Development Communications

Michael Mitshali, Coordinator

Swaziland Save the Children Fund

Lindiwe Tsabedze, Nutritionist

A.I.D./Washington

Martin Forman, former Director, Office of Nutrition
Chloe O'Gara, Cognizant Technical Officer (initial phase)
Nina Schlossman, Cognizant Technical Officer (later phase)

Manoff Group Staff and Consultants

Marcia Griffiths, President and director, The Weaning Project
Edward Green, research consultant
Benedict Tisa, materials development consultant
K. Mona Moore, communication/training consultant

ACRONYMS

A.I.D.	Agency for International Development of the United States Government
FGD	Focussed group discussion
MOAC	Ministry of Agriculture and Cooperatives
MOH	Ministry of Health
NNC	National Nutrition Council
PMC	Project Management Committee
RHM	Rural Health Motivator
SINAN	Swaziland Infant Nutrition Action Network
TWP	The Weaning Project
UNICEF	United Nations Children's Emergency Fund
UNISWA	University of Swaziland
USAID	The A.I.D. Mission in Swaziland

TABLE OF CONTENTS

BACKGROUND AND PROJECT ORGANIZATION

By the mid-1980s it had become increasingly clear within the nutrition and health communities that young child feeding and associated practices were a major cause of poor child growth in developing countries. A few pilot projects had shown that enhanced communication efforts could improve both feeding practices and child growth. To further develop methods from these promising experiences, the Office of Nutrition of the United States Agency for International Development (A.I.D.) awarded a contract for The Weaning Project (TWP) to Manoff International Inc. (now The Manoff Group) in late 1984. The contract called for in-depth investigation of young child feeding practices and the design of nutritionally sound, low-cost, and sustainable actions to improve them.

Antecedents in Swaziland

In 1983, a national nutrition survey undertaken by the Swaziland National Nutrition Council (NNC) clearly documented a child nutrition problem and indicated several factors and family characteristics associated with infant and young child undernutrition. Forty-two percent of the 18-24 month olds were found to be stunted, and the infant mortality rate was 113/1,000 live births, indicating a worse situation than would be expected for a country of Swaziland's level of social and economic development.

At a workshop in 1985 where the results of the survey were presented, the National Nutrition Council decided to initiate new programs to address the country's nutritional problems. Two of the priority actions were protection of breastfeeding and improvement of weaning and young child feeding. The Council agreed to undertake a project to improve infant and young child feeding *practices*, primarily through education. The educational emphasis was chosen because the survey indicated that most families had some income elasticity and a basic level of food security. Also, there were educational agents available to work at the community level. A cadre of home economists from the Ministry of Agriculture and Cooperatives (MOAC) was in place and Rural Health Motivators supported by the Ministry of Health (MOH) would be available soon. Radio ownership was high, and recent popular educational programs had been successful.

Early in the development of the action plan and project idea, UNICEF expressed its willingness to support a nationwide effort to improve feeding practices. USAID offered technical assistance through the centrally funded Weaning Project. In March 1986, The Weaning Project's manager from the Office of Nutrition, A.I.D. went to Swaziland to work with members of the NNC and UNICEF to write a proposal for a jointly-funded effort.

The proposal called for the NNC to provide the staff to manage the project, UNICEF to fund local costs and provide a nutrition officer to assist in management, and A.I.D. to support technical assistance from Manoff International's Weaning Project over the life of the project.

In September/October 1986, the first technical assistance visit was made to review overall project design with NNC members and major donors. The proposal, written by representatives of the MOAC, MOH, The Weaning Project and UNICEF, was submitted to UNICEF in June/July by the NNC. It outlined five major project phases and provided a general implementation plan. Once the general work plan was approved, in October the NNC Technical Committee prepared a detailed activity plan and budget which UNICEF agreed to fund in increments.

Thirty weeks of technical assistance (11 trips) were identified in the implementation plan for the 33-month project (October 1986 to July 1989). The budget for this assistance was calculated at $126,241. UNICEF assistance for project activities was initially calculated at approximately $140,000 over three years.

During the October 1986 technical assistance visit with the NNC technical committee numerous field trips were made to different parts of the country to interview women either individually in their homes or in groups about child rearing and infant feeding practices. Some of the findings from this informal research corroborated existing information or peoples' suspicions, but others, such as the inadequacy of the weaning food *indegane* (because of dilution) for children four months and older, were new and potentially important.

Project Organization

The project organization was unusually collaborative, an arrangement that had the potential for high effectiveness as well as for delay and unclear responsibility. At all levels and in all functions, the project required several organizations to collaborate. The project organizers, the NNC, believed that this would help ensure sufficient staff, provide training to the most appropriate people, and institutionalize project processes and results.

The lead organization was Swaziland's National Nutrition Council. This is a legally constituted intersectoral organization with members from almost a dozen agencies and projects who meet regularly to work together to address nutrition problems. Representatives of the MOAC and the MOH share major responsibility for NNC activities. The NNC group requested a weaning project, sought funding from UNICEF, and arranged technical assistance from A.I.D. The NNC was responsible for monitoring project progress and giving advice to the project coordinating group that at first functioned as a technical committee of the NNC but later was known as the Project Management Committee (PMC) and functioned autonomously.

The PMC was appointed by the NNC to implement or oversee implementation of all project activities. Members were assigned by their agencies (MOAC, MOH, University of Swaziland, and UNICEF) on either a full- or part- time basis to the project. Because the lead institution in the project under the NNC was the MOAC, it assigned the project coordinator, who was to be virtually full-time, and a research director, full-time for the duration of the assessment phase research.

To establish a local identity and an umbrella that would be inclusive of both breastfeeding and the weaning period, the project was named Umkhankhaso Wekondla Kahle Batfwana Labancane or The Project For Improved Young Child Feeding.

Synopsis of Project Phases

To avoid the mistakes of many health and nutrition education programs, the work plan was built around the use of a social marketing methodology. Social marketing requires careful consumer research prior to message design; the formulation of a strategy to avoid undertaking isolated activities that amount to less than the sum of each one; careful definition of target audiences; attention to drafting creative, well tested messages and materials; careful monitoring of activities; and coordination with other ongoing programs. Following is a synopsis of the four main project phases.

- *Assessment: February 1987 to May 1988*

The assessment began with a review of existing literature done to identify what was known and where important gaps existed. Then a series of qualitative research activities was undertaken beginning with focussed group discussions to explore general perceptions and attitudes related to children, child care health and feeding. This was followed by in-depth interviews and observations in households, and, based on the results of the initial interview, trials of new behaviors were carried out in participant households. This phase ended with a synthesis of information gathered during each step and the dissemination of the report summary to all development workers.

- *Strategy Formulation and Design: June 1988 to July 1989*

Strategy formulation began at a workshop during which the results of the assessment were shared. Later, local artists were brought together to work on the creative strategy and materials. Key products were counselling cards and a flipchart (produced using computer graphics). A project logo, song, and other materials were also designed. All materials were pretested, revised, and printed.

- *Implementation: August 1989; still ongoing*

Initially, home economists and clinic nurses were trained in the use of the materials. Later, Rural Health Motivators, male agricultural extension workers, and others were included. The first component launched was interpersonal counselling and community education. Later, radio programs were completed and other promotional materials (banners and tee-shirts) were made and distributed.

- *Evaluation*

Once the materials were being produced, a baseline survey was discussed and plans left with the PMC. A baseline was conducted by University of Swaziland (UNISWA) after the completion of The Weaning Project technical assistance. To date, there has been no formal evaluation of the program, although activities continue mainly through the MOAC, the MOH, and the local NGO (SINAN) that is responsible for breastfeeding promotion and support.

THE ASSESSMENT

Methodology

The first phase of activities in Swaziland was an assessment to understand the rationale behind existing practices that precipitate particular young child feeding problems. The emphasis in the assessment process was on obtaining an in-depth look at feeding practices within the broader household and community context. Also, it identified the major resistances to changing those practices and the important motivational factors to encourage change. The research was qualitative and multi-stepped, with each step building on the previous one, and it used a small sample.

The first step was a literature review. Here, there were some twelve major studies to review. The nutritional status situation and its causal factors were well documented. Also, the decline in breastfeeding in the recent years was documented by several good studies. However, the studies on weaning--the introduction and continuation of foods following exclusive breastfeeding--were few and not thorough. In general, there was a lack of information on why people followed certain practices and what they thought about particular "modern" and "traditional" concepts. The NNC published a summary of this literature in 1987. Major findings included the following:

- Practices promoting undernutrition begin at birth, because colostrum is generally discarded and breastfeeding sometimes delayed for three to four days.

- The period of exclusive breastfeeding is extremely short or non-existent. Non-human milk is introduced in the first few weeks of life.

- The introduction of semi-solids occurs too early. Studies indicated that the first food is usually a soft maize porridge, but little information is available on exactly how this is prepared (dilution) or how much is fed.

- Young children are fed a relatively restricted diet in terms of variety of foods. However, no detailed information was available that specifically looked at children under two years of age.

- The typical pattern is that children are fed from a single dish that contains food for all children. This makes it difficult to gauge the quantity of food consumed by a single child.

- Little information was available on what types of snacks are given to children under two years of age.

- Practices probably vary less by agro-ecological zone than by socioeconomic environment.

- Families where parents have little or no formal schooling and where incomes are low are particularly at risk for poor child feeding practices.

On the basis of this literature review, research priorities for The Young Child Feeding Project in Swaziland were determined to be the following:

- Low income households with parents with little or no education, older adults (grandparents) caring for children, and mothers who work away from home.

- Decision-making: How much does Swazi tradition influence decisions and why? How much does the concept of "modern" influence decisions (on milk formulas, bottles, commercial baby foods) and why? Who influences different decisions and who has authority to offer advice? What do people aspire for/desire for their children?

- Concepts of health: How is food related to health? How are growth, health, and food related? What is the interaction between the traditional healing systems and modern health services? How do mothers judge if their child is well nourished/satisfied with food?

- Detailed information on feeding practices of children under two years of age, including food preparation (dilution of porridge), frequency, duration of each food, nipple soreness, and effects of work patterns.

The PMC agreed that the qualitative research should follow a protocol similar to that tried in other Weaning Project countries but with question guides modified for the Swazi context. The four-step protocol that was adopted included focussed group discussions, in-depth household interviews, household trials of proposed behaviors, and a second round of focussed group discussions.

This qualitative research methodology was particularly appealing to the PMC because: (1) it does not require a large number of researchers; (2) each step can be done relatively quickly, allowing the researchers to handle their regular work responsibilities if necessary; (3) it would provide everyone with a new learning experience and make those PMC members with strong

quantitative skills better all-around researchers; and (4) they realized that the program would also have a quantitative research side that could support the qualitative research. There would be a baseline survey done prior to the program launch and a follow-up survey done after the program had been running for some time.

The research team wrote a qualitative research manual. This activity fulfilled three purposes: to train the research team, modify the research protocol for Swazi conditions, and leave a guide that could be used again for other research. The first draft discussed the theory of the methods and what should happen. Later, it was adapted for what actually happened, offering guidance on important decisions to make at each step. The manual included all of the question guides. Working with the team (primarily public health nurses and home economists) on the manual and training them in the research and analysis techniques was the primary job of the technical assistance. The Swazi research director and her colleague from UNICEF oversaw all field work and initial analysis.

The first step in the assessment was open-ended focussed group discussions (FGDs) to: (1) explore, in a general fashion, basic concepts of child health, aspirations for children, role of child feeding, "modern" and "traditional" practices, advice seeking, etc.; (2) to help generate ideas/hypotheses for further study in the in-depth household interviews; and (3) identify risk groups and assist with audience segmentation for the program. Detailed plans were made for the first round of FGDs. The major geographic areas to be sampled were: rural, remote areas (traditional values adhered to), rural but not remote, urban (periurban poor and lower middle class), and a company town. Within each type of geographic area, the following people were sampled:

- Mothers or female caretakers of mother's generation with children 0-24 months old with little or no formal education (general mothers);
- Mothers with similar characteristics (see above) but with just one (her first) child 0-24 months old (inexperienced mothers);
- Mothers with children 0-24 months old who work outside the home for more than six hours and are not accompanied by the child (working mothers);
- Fathers who have little or no education staying with children 0-60 months old;
- Grandmothers who are the principal caretakers of children 0-24 months old.

When site specifications and group characteristics were matched, a minimum of 20 FGDs were required.

The research team was trained to make decisions about the following: (1) how the focus group participants would be recruited; (2) themes and techniques to use in the sessions; (3) how to conduct the group (role of the moderator); (4) how to take notes: (5) the tasks of the supervisor; (6) the logistics of field work; and (7) how to analyze the information.

During the next several months (November 1986 to March 1987), the project research team conducted the FGDs and initiated the analysis process; struggled with and resolved some of the financial management problems; and made several presentations on the project plan and the initial phase of work. Despite the obvious progress, the first six months of activities were not easy. The FGDs took longer than anticipated, causing some problems because of the other job responsibilities of MOAC and MOH personnel. Administrative problems arose, rooted in the nature of multisectoral project implementation.

Prior to analysis, the team completed verbatim transcripts in SiSwati. They were long (some filled three notebooks) because of the custom of expressing ideas in lengthy stories and because written SiSwati is not concise. When analysis began, it was tedious because of the length of the transcripts. Midway through, the process was shortened by doing more synthesizing in each analysis step. There were three steps: summaries of each FGD by topic; summaries of each group's/segment's responses by each topic; summaries of all responses to each topic with contrasts by group mentioned when appropriate.

Because the FGD step of the assessment took much more time than expected, adjustments had to be made in the assessment plan. The process was modified in a way that would save time but not compromise the outcome. These changes, estimated to save three to four months, were to:

- eliminate the second round of FGDs (the first round had been so thorough; the second became less necessary);

- follow the analysis of FGDs with the elaboration of a list of possible practice changes, motivations for them, and resistances to them. Use the list to make the question guide for the household interviews and observations focus on the most important information.

- combine the household observation/interview segment with the intervention trials as one field activity with only a brief "rapid analysis" period between the observations and the trials. The hope was that for the rapid analysis the team might stay in the field and refine the household activity as they moved from one locale to another.

Although not all of these changes were implemented as planned, they were attempted. The household segment of the research was comprised of two main activities: in-depth interviews and observations, and household trials.

The household segment of the assessment was designed to explore in detail the practices of mothers and other caretakers related to child feeding. Some topics such as rural social organization, status of women, agriculture and gardening were not included as the team felt these were covered well in other studies.

The sample for household interviews, observations and trials was taken from areas with the following characteristics: rural, remote; rural, not remote; and periurban. The criteria for deciding eligibility of a household were:

- a child equal to or less than two years on the day of the recruitment visit;
- a female child care taker who had been with the child for more than a month;
- a socioeconomic status that appeared low as compared to surrounding homesteads;
- a child with nutritional status as needed by the plan. The idea was to look at homes with both well and undernourished children. The distribution per site was:

age	well nourished	undernourished (<2SD)
0-3	3	
4-6	1	2
7-12	1	2
13-17	1	2
18-23	1	2

The total sample of households was 45. They were carefully selected through a special recruitment activity.

A team of five ethnographers, home economists from the districts, were trained in open-ended interviewing techniques, diet recalls, morbidity histories and structured observations, including inventories. The team of supervisors and ethnographers moved to the research areas for the duration of the field work. The ethnographer visited the homestead for either one full day or on three occasions covering the time equivalent to a full day. During the visit, participant and structured observations and in-depth interviews were carried out. In some cases a sample of the porridge fed to the child was collected.

In each area, roughly ten key-informants, from whom the community received health/nutrition advice or who provided a health service for the community, were recruited for short interviews. The appropriate persons to be interviewed were defined during the field work and differed between the areas. Most of the interviewees were traditional healers, traditional birth attendants, Rural Health Motivators, home economists, and clinic nurses. These key-informants were asked mainly about child rearing/health practices within their own communities.

Following the first phase of field work, a small team tabulated, collated and summarized the information contained in the ethnographers' notebooks. Great care was taken to use all of the information and to consider the comments and judgments of the ethnographers. For each child, a diet history and recall sheet was completed. This contained the child's age, nutrition and health status, and whether or not the mother was present full-time in the home. On each sheet, the age at which foods were introduced and a rating of the current diet was given. These diet sheets allowed great flexibility in the analysis of many variables.

In the final stage of analysis, well nourished and undernourished children were compared by age group, according to practices, diet histories, illness histories and general child care. This comparison was intended to reveal the constraints to good nutrition, practices or factors which seemed to protect against undernutrition, and the degree of variance in the practices where they occurred in the same environment.

Immediately following the analysis of the household interviews planning began for the trials. For each age group, actual and ideal practices were contrasted and acceptable compromises between the actual and ideal situations were sought. Investigators enumerated points of resistance on the part of the mothers to changing practices, and reasons that could persuade them to adopt new practices. Using this information, a "menu" of practice changes was drawn up. From these practice changes, one or two were chosen for trial by the mother according to the needs of the child. The ethnographers were trained in the principles behind each of the changes and in how to introduce them to the mother. They were also trained to demonstrate to the mothers the use of malt[1] in the children's porridge.

The ethnographers who did the initial household interviews returned to the same households for the trials. They reviewed with the caretaker any changes in the child between the two visits and then repeated the dietary recall. Based on the recall, the ethnographer and mother together reviewed the "menu" of possible practice changes and decided which the mother would try during the next week. After the week, the ethnographer returned to discuss the new practices with the mother. Did she try them? Did she like them? What, if anything, did she change? Would she continue with them? The results and the mother's comments were noted.

The results of the trials were analyzed by age group. Firstly, a list of the most frequently selected practices was compiled. Following this, the practices which had or had not been continued for a week were noted along with the reasons for and against continuing the practices. This analysis, basic tallying of practices and review of diet recalls, allows a judgment

---

1 Malt, germinated sorghum, used in beer brewing contains amylase, an enzyme that will break down starch. Adding amylase to, for example, the family's corn porridge (which is made so thick it can be cut), will thin and soften it. Reducing the viscosity preserves the caloric density while transforming the porridge to a consistency appropriate for young children.

to be made as to whether the change in practices is possible and will effect an increase in nutrient intake.

Because information from each assessment phase had been compiled and synthesized during the process, the final compiling of the information was done quickly. The results of all of the assessment activities were published by the National Nutrition Council with funding from UNICEF. The reports were distributed to most program managers and decision-makers affiliated with the Council. The Summary Report, however, was distributed, in addition, to all health, agriculture, and community development workers in Swaziland. Following are some of the assessment results from the Summary Report.

Summary Results

What Are the Characteristics of the Families?

- Most households/homesteads were extended families, although one-third did not have an adult male present. The exception was in peri-urban areas where it is more common to find a "nuclear" family.

- Generally, the adult female-to-child ratio favored the adult females. The exception is the peri-urban area. However, in rural areas there can be as many as six children under five to care for in a homestead.

- Literacy levels generally were low. Three quarters of the mothers either had no education, were primary school dropouts, or were attending adult literacy classes. (The National Nutrition Survey indicated a strong link between mothers' low literacy levels and young children's stunting.)

- Both environmental and household hygiene were found to be poor. (The absence of a pit latrine was highly correlated with undernutrition both in the study and in the National Nutrition Survey.) Other hygiene problems were: water storage, refuse disposal and pest control.

- Many of the households of undernourished children were classified as having very low food availability (research was done in the months before harvesting). However, in general there was some resource flexibility. Only about 8 percent of the households that participated in the trials could not comply with at least one recommendation for improving child feeding practices because of the lack of food/resources.

- Very few of the mothers are members of organized groups.

Therefore

Resource constraints do not appear to be absolute in the vast majority of households so it seems that an educational program to improve practices is appropriate. However, constraints of resource availability and literacy must be considered if the program is to be useful for its intended purposes.

General hygiene is a problem for everyone. This program should strengthen the links with water and sanitation programs to spread their messages and direct their resources to the most vulnerable households.

The program should make an effort to reach remote homesteads.

What is the maternal role?

- Motherhood begins early--in some cases by fourteen years of age.
- Most children were cared for by their mothers but some were in the full-time custody of their grandmothers.
- Generally, mothers were around the house. Many were thought to be "not busy" or "moderately busy" when their days activities were reviewed. However, the mothers' perception was that they are busy. They welcomed time-saving suggestions.
- About half the mothers had someone who assisted with child care. This was much more common among undernourished children even though only one half of the mothers of a malnourished child worked outside the home for eight hours or more.

Therefore

Time availability does not appear to be a serious hindrance to changing feeding practices. The exception is the minority of women who work outside the home and feel they have a problem with obtaining child care.

Providing the appropriate child care could be a critical intervention in the peri-urban areas to improve child feeding. This could be a low-cost program since many women already pay something for child care and would continue to pay for the "peace-of-mind" of good care. In the rural areas mothers must be encouraged to do the feeding themselves or to be sure instructions about child feeding are clear for other caretakers.

How Do Parents View Life in General?

- Views of:

  - The Past — Better than nowadays because people had economic independence. Life was also viewed as healthier with fewer diseases.

  - The Present — Financially, life today is a struggle. People have to depend on a job/husband/employer for their financial security and this is considered undesirable. It is also said to be expensive to feed children nowadays.

- Major shifts over time related to child-rearing, are recognized:

  - This generation relies more on commercial products for infant feeding: formulas, milk powders and instant baby foods, while the previous generation used cows milk, *inembe*, *emasi* and other "family foods".

  - Fathers noted that in the past only mothers were responsible for the care of young children. Nowadays, fathers are also concerned about child welfare and nutrition to the extent that they buy milk formulas and other foods.

  - Today, illness is treated by a combination of modern and traditional methods. For diarrhea and vomiting, parents specifically noted that the first referral is the hospital, whereas in the past it was the traditional healer. For some illnesses, such as a sore throat, traditional therapies such as "*kugeza lishashati*" are still used.

What Are Parents' Aspirations for Themselves and Their Children?

- Parents aspired to build a house and to have land–"*ekhaya*".

- A happy home was seen as one where financial independence has been gained, both parents are present, and the home is clean.

- Parents hope that their children will:
  - be healthy, live long, and have luck;
  - receive education and become financially independent
  - comply with social norms of good conduct (both Christian and Swazi).

- Parents are happy for their child to live in a rural or urban area but there was a clear preference for rural areas, town being only an economic compromise. Most parents felt that it is important that the child at least have links to the rural area and that he help with development of the area.

Therefore

Appeals should be made with people's view toward a better future in mind. Traditional and "modern" views and values should be mixed, the good aspects of the previous generation's practices carried forward but altered by "modern" knowledge.

Concern over the cost of living today and a desire for financial independence are almost universal and should be considered if any "new product/practice" is to be promoted.

The role of fathers in child rearing, as recognized by themselves, should be utilized.

Generally, What Do Parents Think About Child Health and Nutrition?

- "A house might be rich, but the parents careless" summarizes what parents thought about what is needed to ensure the health of their child--money, but also caring and "cleverness".

- Awareness of feeding a child well to maintain good health was high. Milk was a universally recognized good food.

- Complaints of children having poor appetites were common. Appetite medicines, enema or force feeding are remedies.

- Both traditional and modern practices were thought to be important to maintaining the health of the child. Immunizing or protecting the child in the first months of life by traditional means was widely practiced. But, also, BCG vaccine was recognized.

- Few mothers had objective criteria such as weight gain that they used as a sign of good health. Many undernourished children who were not growing were thought by their mothers to be growing.

Therefore

The concept of looking after the children and of caring as it relates to feeding and other practices should be emphasized. The key to many of the problems is lack of awareness and supervision of the child. This should be an underlying project theme.

Any authority figure associated with child health and nutrition should be someone knowledgeable about both modern and traditional health practices.

The link between illness, appetite loss and growth-faltering needs to be strengthened. These signs can be used to trigger specific changes in feeding practices.

Where Do Mothers Get Their Information About Child Health?

- Mothers were very eager for advice on child feeding and were willing to try new practices. During the trials of new practices not one mother declined to participate.
- The most common source of information on child feeding was a family member, usually an older woman. Fathers were mentioned as people who sanction certain child health and feeding practices.
- Mothers have learned lessons from the clinic nurses even if the advice is not always practical, current or applied correctly: they give milk with *indengane* (corn porridge), they have stopped giving sour porridges, and they use ORS/SSS for a variety of illnesses and have adapted its use for prelacteal feeding.
- Grandmothers were the only participants who attended organized groups.
- Working mothers seemed to be the most isolated.
- Most mothers said they would like to receive information from their home economist, Rural Health Motivator or clinic nurse.

Therefore

Face-to-face contact offers promise. Home economists, nurses, Rural Health Motivators, and other individuals (perhaps Red Cross, Save the Children Fund field officers, or church organizations) who come into contact with mothers of small children, should be well versed in the various aspects of child nutrition. It is important to explore informal channels and going to places of employment because many vulnerable mothers are not members of organized groups.

A radio campaign also may be effective since most homes have a radio in working order. Radio may be a good way to reach men who may not have access to many of the professionals and groups offering advice on child feeding. Also, an attempt to discuss child nutrition in men's organisations may prove worthwhile.

Do These Families Differ in Their Views or Practices?

- In general, no large differences between families from the different places were seen, nor did ideas about children, health and nutrition vary much between peri-urban and rural settings. The one exception was work and child care patterns: peri-urban mothers are more likely to work away from home for long periods during the day, and they were less likely to have other family members to care for their children.

- There were no marked differences in mothers' attitudes. However, inexperienced mothers tended to follow more traditional practices because they get their advice from the older generation. Other mothers with more confidence relied less on their mothers/mothers-in-law for advice. Working mothers, while sharing the same attitude as other mothers, complained about the inadequacy of maids in providing child care.

Therefore

It seems that no major audience segmentation need occur based on ecological zone or level of urbanization. Segmentation, probably, should occur only based on the concerns of mothers for their children of different ages and when they are ill or recuperating. Working women may be the exception, and may require special materials.

HOW DO MOTHERS FEED THEIR CHILDREN?

At Birth

- Water with sugar was slightly more prevalent than breast milk as a fluid offered at birth.

- Women who deliver at home generally discarded colostrum and gave water. In the hospital, use of water and breast milk were practiced equally.

- Giving water was thought to be important before breastfeeding because it cleans the throat and stomach.

- A few mothers thought that colostrum was dirty milk, but generally it was not given because the mother was told not to give it.

First Three Months of Life

- Breast milk was given but only a few children were exclusively breastfed past the first month of life.

- Mothers introduced other milks by the first month of life because: they felt their breast milk was not sufficient and the child cried for food; the child got sick and needed something else; they got milk from the clinic or father; or, they had a problem breastfeeding--usually sore or cracked nipples or inadequate milk supply.

- Mothers usually had good breastfeeding "style" while the baby was still young (0-3 months) but slightly favored one breast.

Three to Six Months

- Children continued to be breastfed, but often less than six times per day. Positioning was not always correct and preference for one breast increased.

- Virtually all children were receiving supplements (formula and powdered milks) plus cereals, usually in a liquid and fed via bottle. By the fifth or sixth month, the cereal was prepared as a soft porridge (*indengane*).

- Well nourished children were more likely to have milk and/or sugar added to their porridge than were undernourished children.

- *Incwancwa* (sour porridge) was not given to young children because mothers thought it caused heartburn and made the child thin even though it was eaten by about half the adults.

- By six months, half the children were receiving *liphalishi* (stiff corn porridge) with gravy or *emasi* (sour milk).

- During this period all young children's food was considered to be either liquid or thin.

- Although children were fed frequently, the amount of food they received was not satisfactory.

Six Months to One Year

- Breastfeeding declined in frequency and was of very short duration (less than four minutes/feed). The preference for one breast was strong by this age.

- During this period more and more children received *liphalishi*. By ten months, almost all children were eating it at least once a day.

- Although *liphalishi* was given to the child, there was still a reliance on thin porridges. No child of this age had a diet considered to be of the appropriate consistency.

- There was not much variety in the types of foods offered to children. Often they did not receive much relish.

- Mothers withheld some foods. The foods varied from mother to mother but the reasons were the same: child will become greedy; child will get a stomach ache, heartburn or constipation. Mothers of malnourished children withheld many more foods than mothers with well-nourished children.

- Mothers fed their children four to five times per day, but gave very small quantities of food at each feeding. Appropriate quantities were eaten only about twice per day.

- Generally, the mean solid content of the *indengane* was 13% compared to 27% for *liphalishi*.

<u>One to Two Years</u>

- By fifteen to eighteen months of age most children had stopped breastfeeding.

- Food consistency was seldom suitable for these children, which seemed to affect nutritional status. Three-quarters of the undernourished children had a diet classified as liquid or thin while all the well-nourished children had diets classified either medium or suitable. (Mothers of undernourished children offered the breast more than food to their child when they cried.)

- The frequency of feeding remained between four and six times per day. Mothers of these children could not report accurately how often they had been fed.

- The amount of food given varied between well and undernourished children. Well nourished children received 2-3 meals and 1-2 "snacks" (small feedings) per day while undernourished children got 1-2 meals and approximately two "snacks" per day.

<u>Children Who Are Sick</u>

- During the household observations about one-third of the children were ill and another third had been seriously ill in the recent past.

- Breastfeeding was continued and often ORS was given.

- Force-feeding of semi-solid foods was practiced when the child did not want to eat (more common among mothers of well-nourished children).

- When children suffered from respiratory infections *emasi*, fruits, and *indengane* were favored foods.

- Enemas were given regularly to all children for a variety of problems or as a preventive measure.

- *Timbhita* were given for problems such as poor appetite, colds, crying, digestive upset and coughing.

- No special feeding took place during the first weeks after a child had been ill.

Other General Practices and Observations

- Mothers did not increase breastfeeding frequency if they were not producing enough milk.

- Generally, young children had their own food dish or shared with one other child. However, as they got older there was a tendency for them to eat from the common plate.

- Older children were not carefully supervised by caretakers when they ate.

- Mothers did not measure food for their children.

- Mothers (especially those with undernourished children) did not always encourage them to eat if they had poor appetites.

- Hygiene was generally ignored.

- Mothers said the constraints to increasing feeding frequency or amount were cost, time, scarcity of food, wastage of food, or fear of the child becoming obese.

Therefore, the major problems are:

1. At birth: Infants were not placed on the breast immediately and most were given water.

2. First months of life: Infants were not being exclusively breastfed. Supplements, usually formula milks were given much too early, often in a bottle.

3. By four months: The cereal that was supplementing breast milk was too diluted for the caloric needs of the child.

4. Six months to one year: As children were incorporated into the family diet they did not receive the family food. The food remained too diluted: not enough *liphalishi* and not enough relish was given. Serving sizes were small and breastfeeding frequency and duration declined.

5. Second year of life: Children were not fed enough food. For these children the amount per meal and the consistency of the food were still not satisfactory.

6. Children who are or have been ill: The incidence of illness was high. There is no concept or practice of recuperative feeding.

7. Mothers did not measure their child's food and thus had a limited idea of how much their child was eating.

8. Mothers did not supervise their children as they ate nor did many of them encourage the children to eat when they had a poor appetite.

9. Hygiene was ignored.

What can be done?

In terms of the potential success of different practice changes, it seems that:

- Prenatal and postnatal counselling on various breastfeeding techniques is vital to discouraging the initial use of bottles. Although it seems possible to encourage women to breastfeed more frequently, and perhaps for longer periods if their babies are under about fifteen months, it is extremely difficult to ask a mother to stop bottlefeeding her child. In all of the cases where a mother was asked to stop bottlefeeding completely, she could only decrease the frequency. The emphasis must be placed on preventing the use of the bottle.

- The concept of mothers introducing an "enriched" or energy-dense soft porridge when the child is four months old (the child is in the fifth or sixth month) holds tremendous promise. In the *malt* trials, only one trial out of ten was negative. The trials to mix *emasi* and milk powder with *liphalishi* were also successful. It is also encouraging that with the introduction of the semi-solid porridge the more liquid feeding was stopped in all five cases where it was tried. Use of sour porridge (*incwancwa*) was not successful because of strongly held beliefs about it causing heartburn (a concept introduced in the last generation as Swazis traditionally gave incwancwa to their infants).

- Increasing the energy density of older children's food with anything other than the family relish plus some oil will be difficult. It does seem possible to increase relish consumption from its current level, but this seems to be one area that touches on resource constraints. The popularity of feeding from the family pot because it is cheaper, quicker, easier and involves no special cooking for the child should be emphasized.

- Increasing frequency of feeding does not have to be separated from increasing the amount per serving. It seems mothers are able to do one or the other and, in many cases, both. However, few achieved the ideal we were seeking, especially in terms of amounts of food per meal. The mothers underfed by about a quarter of a cup compared to what was expected on total volume per meal. Children from seven to 11 months ate about half a cup per meal. The older children were able to increase their intake by about half a cup per "meal" or by about one and a half cups per day. It seemed that mothers were able to increase frequency by about two more times per day--either in snacks or meals and achieved a total frequency of four to five feedings per day. Mothers will need precise information about frequency and quantity.

- Introducing the idea of measuring the child's food by separating the food into his own bowl was well received where families had enough utensils. This practice should fit well with an overall effort to encourage mothers to be conscientious about child feeding.

Appendix A contains more detail on the results of the household trials as presented in the Summary Report.

STRATEGY FORMULATION AND THE COMMUNICATION PROGRAM

The Overall Strategy

In June 1988, preparations began for a strategy formulation workshop. Invitees included representatives from ministries or agencies who would play a role in project implementation. Prior to the workshop, the project team developed a list of project objectives and a list of priority areas for interventions. These were shared with the NNC and the project board of directors and then revised for presentation at the workshop. At the workshop, participants:

- shared and discussed the results of the assessment;

- established a strategy and identified the priority activities to undertake to correct the major problems affecting young child feeding;

- set specific objectives for the communication and training program;

- defined the participation of each agency in managing and implementing priority activities; and

- specified the role of the project implementation group in coordinating and supporting implementation activities.

The project goal and objectives, including behavior-change objectives that were endorsed by participants follow:

Project Goal

To improve young children's (0-24 months) nutrient intake and thus reduce growth faltering and early childhood stunting.

Project Objectives

1. To launch an information effort to create awareness about the importance of child feeding and general child care.

2. To train and support all principal suppliers of information on child feeding in their efforts to encourage the practices specified in no. 5 below.

3. To promote specific products to facilitate particular practice changes:

   - - powdered malt;
   - - a bowl for the child 0-24 months with the amounts to be fed at different ages marked on the side of the bowl and the number of times per day depicted graphically.

4. To effect changes in attitude and knowledge critical to achieving the practice change.

5. To effect changes in child feeding practices:

   0 to 4 months

- Mothers should initiate breastfeeding immediately after delivery.

- No water, formula or other milks, or bottle should be fed to newborns (nor should bottles be used with children of any other age).

- Mothers should exclusively breastfeed their children for the first four months of life. They should breastfeed fully:
  - on demand, at least eight times during the day;
  - both breasts be used equally;
  - children suckle for five minutes on each breast.

  Note: Working mothers should consult breastfeeding counsellors on how to express, store and feed breast milk.

4 to 6 months

- A soft, energy dense porridge should be introduced only when the child has completed four months. This porridge should be fed twice/day and introduced gradually until the child is eating about one-fourth cup per feeding at five months of age. The porridge should be either:
  - thick, *indengane* with milk powder; or *sitfubi*;
  - *liphalishi*, thinned with malt or *emasi*.

- The child should continue breastfeeding fully, i.e. about six times during the day from both breasts and for five minutes each breast.

6 to 10 months

- From six months of age (beginning the child's seventh month) until 10 months, the child's food should come from the family pot. It should be given at least four times/day, 1/2 cup of liphalishi per feed. The food must be nutrient dense. It should be:
  - *liphalishi* thinned with malt and mashed with the family relish, e.g. bean soup, groundnut relish or *emasi*.

- The child should also continue breastfeeding fully from both breasts and for five minutes per breast.

10 to 18 months

- From ten to eighteen months, children should be fed all adult foods. They should be fed five times per day.
  - A meal should consist of 3/4 cup: of *liphalishi* plus plenty of relish from the family pot.
  - Extra oil should be added to the child's relish.
  - Full breastfeeding should be continued.

18 to 24 months

- From 18 months through the child's second birthday, he should eat more of the family foods but - - at least five meals per day. Each meal should consist of one cup *liphalishi* plus relish with extra oil or other "good" foods.

Illness

- During illness, children should be fed more frequently with their usual food or their favorite foods. If the child prefers soft food, *liphalishi* should be thinned with malt and *emasi.*

  Note: Children with no appetite must be encouraged (mothers persist) and feed sour foods, e.g. *emasi* and *incwancwa.*

Recuperation

- When the child feels better or when the symptoms have gone, he should receive special foods and more food for at least one week: - - margarine, oil, peanut butter; - - an extra bowl of *liphalishi* plus relish.

Own bowl

- From the time soft porridge is introduced the child should have his own bowl to enable the mother to measure his food.

Hygiene

- Domestic and personal hygiene standards should be raised to ensure that the child's environment is as disease free as possible. This includes covering the child's food, cleaning the utensils and building pit latrines, rubbish pits and keeping surroundings as clean as possible.

Caretaker

- Mothers will take responsibility for child feeding, but if she delegates to a child caretaker, specific instructions should be given.

Based on the priority activities outlined by workshop participants, the project team identified six areas of activity and presented them to workshop participants. The participants' comments and commitments for each of the six areas formed the basis of the overall strategy and action plan.

1. **Education and public information:** This area should include a general awareness of child feeding and child care, the project and the project's "agents" and "products", and specific information on changes in practices with "how to" instructions.

   - men and teenagers are important audiences in addition to mothers;

   - The major needs are for general orientation materials to use with groups, counseling materials, and mass media materials, especially for promoting breastfeeding.

   - Strong commitments came from the water and sanitation project to collaborate on any materials of mutual benefit (e.g., household hygiene); from the Development Communications Project (DevCom), which works with 27 technical specialists who produce radio shows each week, to carry project messages (DevCom producers could also help with other project radio materials); and from Sebenta, which agreed to print literacy materials on child feeding.

   In general, workshop participants recognized that their own program's resources were limited, so they looked to the project to produce the core educational materials for their programs.

2. **Training:** This area should include in-service training on general concepts and how to communicate messages; changes in preservice curricula for nurses, rural health monitors, home economics colleges, traditional healers and traditional birth attendants, and formal school curricula.

   - Preservice training for a variety of health professionals and the home economists was recognized as needing modification to become more relevant for Swaziland's young child feeding problems. The major users of a preservice module would be the RHM program, program and training institutions for nurses and home economists. The RHM and nursing training coordinators were particularly interested in modules on how to communicate with mothers and counsel on breastfeeding and child feeding.

   - In-service training was described as a need for a variety of service providers, including RHMs, school headmasters, clinic nurses, NGO field workers, sanitary inspectors, and home economists.

   Offers of help in developing preservice materials came from 1) SINAN for the development of a breastfeeding promotion and counseling curriculum for hospital and clinic personnel; 2) the Swaziland Nurses Association and the nurses working in each teaching hospital to develop a curriculum module on child feeding; and 3) the Ministry of Education to begin on basic curriculum reform in home economics and in other subject matter to include child feeding.

In-service training was more problematic. Almost every group wanted something, generally, for a representative of the project to give a lecture or two on child feeding. Thus, the project was given the responsibility to develop two brief modules, one on child feeding and a second on the project, that could be used easily by a variety of presenters with different audiences.

3. **Food/utensil provisioning:** introduction of malt and a bowl for young children.

   - The introduction of malt as a way to soften *liphalishi*, so that children can eat this calorie-dense food, was presented to the workshop by the project team. The participants raised many reservations due to its use in beer brewing and recommended that the project team should do another, lengthier test of the product.

   - The introduction of a bowl to assist mothers with food quantities was accepted without reservations by the participants, but none felt that their agency was in a position to assist with its manufacture or marketing.

4. **Legislation:** regulation of breast milk substitutes and bottles.

   - There was a need to follow up legislation already being written to regulate the promotion of breast milk substitutes as well as to work with the MOH on a directive to encourage breastfeeding promotion in clinics.

   - No group was eager to work on these activities. SINAN indicated that it had made its contribution by working on the draft legislation. However, they also recognized that it was within their mandate to follow up on the draft legislation.

5. **Child care:** support for mothers working full- or part-time.

   - The growing need for child care, especially in urban areas, was recognized by all participants. The need to train maids in child care with an emphasis on feeding was also considered to be a priority.

   - The only participant group currently interested in child care was Save the Children. It would try to set up a day care program in Mbabane for young children of women who want to breastfeed and work. Once, this center is established and working well, Save might be interested in doing more in this area.

6. **Sanitation infrastructure:** latrine construction, domestic hygiene.

   - The MOH's water and sanitation unit agreed to work with the project and to share materials.

- The home economists wanted to reinstate their home inspection program to promote better household hygiene but needed new resources to do this.

The strategy formulation workshop concluded with the project team agreeing to inform every agency of the final project plans and to call on them to help with the various activities at the appropriate time.

Because the project team would coordinate the basic education and public information component, a second workshop was held with "creative" people (local artists, song writers, musicians, dramatists, and radio producers) to discuss and make general decisions about the media and message strategy. The major agreements emanating from this workshop were:

- to put major emphasis on men and teens in addition to mothers;

- to use a patron who represented traditional Swazi custom combined with a spokesperson who is a well-known authority on health and nutrition or a grandmother with experience raising/feeding children;

- to test as a project logo the Swazi three-legged cooking pot because an essential message is to use family food for child feeding;

- to test as a slogan to unite the program, "Yondlani Sive Sakusasa" (Feed the Nation of Tomorrow);

- to prepare a variety of promotional print materials for each audience:

  - men: posters (at butcher shops, in *shibens*), promoting that they buy other foods in place of milk formula, billboards at soccer games, key rings, and newspaper advertisements;

  - mothers: posters, printed fabric, comics or soap operas in the newspaper, newspaper advertisements, a question and answer column and materials to aid community workers in their discussions with mothers.

  - teens: comic strip in newspapers; special newspaper supplements, school readers, and materials for guides and scouts;

- to prepare audio materials, including an identification song, a drama for live plays and radio, stories for radio, interviews, short vignettes of family life, and spots; and

- to prepare television spots.

Following the workshops, the project team compiled the suggestions into an overall strategy matrix and assigned priorities to particular activities.

The Communication Program

The enthusiasm generated by bringing a variety of creative people together led to the drafting of a number of materials that over time, as they became more refined, were never produced. However, the concepts for all materials that were produced also came from the workshop with artists. It was a critical event for the project.

The communication program was developed to fulfill several roles: advocacy for attention to improved child feeding; project promotion; changing behavior and helping institutionalize better communication techniques. Following is what was accomplished for each.

Advocacy: The project director developed a presentation with slides on child feeding in Swaziland and proceeded to give talks whenever possible on the problems and their solutions.

Project promotion: The project team developed a logo (the three-legged black porridge pot found in all Swazi homesteads); a slogan: "Yondlani Sive Sakusasa" (Feed the Nation of Tomorrow); and a project theme song--traditional singing written and performed by a male *Umbuloho* group. Newspaper articles were written.

Project logo with slogan: *"Yondlani Sive Sakusasa"* (Feed the Nation of Tomorrow)

Behavior change: A drama was written and produced by a local theatre group; a large flip chart with the key messages was developed for community development agents, counselling cards were designed for health workers and home economists to give precise information to families and a series of radio vignettes was designed, but not recorded. In addition, feasibility studies were conducted on producing a plastic bowl for mothers and marketing malt from a local producer of malt for beer brewing. (The activities related to the bowl and malt are discussed in more detail under implementation.)

Institutionalizing communications: For each step in the process a Swazi-specific procedures manual or in the case of communications, a detailed strategy was written. Links were made with appropriate local institutions and individuals to ensure that capacity building was being done with those who would benefit most: the people working in the programs and those with a commitment to this type of endeavor.

The production of the two key print materials merits special mention. At the outset, the PMC looked for an artist who could draw the required images but no one with experience was available. Photographs were considered but there was difficulty both with obtaining crystal clear pictures and with finding people to pose as mothers and fathers and families who would let their child be used in a photograph. The consultant who was working with the project team on materials development noted that the MOAC had several Apple computers donated for another project. They were already in use for some extension education materials. The artist working with the MOAC was eager to improve his computer graphics capability and so dedicated a great deal of extra time, along with the PMC to developing a comprehensive computer graphic capability. A scanner for photographs was purchased and then the artist and team worked to create an image bank. While this took a lot of time and patience, it paid off. The images in the materials are realistic and very clear. The project now has an image bank that they can use for other purposes, they can modify and make new materials easily. Plus, the MOAC has this capability for other projects. Appendix B contains an article that was written about the computer graphics component of the project.

On the following pages are samples of the materials. First, a page from the flip chart (original 30"x 14") "Know How to Feed Your Baby" focusses on the need for children to have their own plate and that the amount to feed at each meal should increase with age. On the next pages of this report is a series from the counselling card set. It shows the cards for four to six month old children: first, for a child who is healthy--general feeding advice; second, for a child who is not gaining weight or who is recuperating from an illness--feeding advice including calorie-rich, "good" foods; and third, for a child who is currently sick or who has not gained weight for three months--feeding advice plus reference to the health services.

In March/April 1989, the draft set of materials was reviewed for technical accuracy and focus on the major priorities identified by the qualitative research. The print materials (flip chart and counselling cards) were pretested.

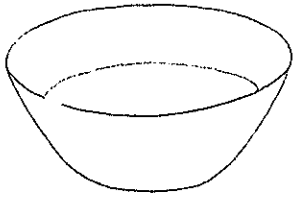
Muphe Kudla Lokwenele Yena
Ngendishi Yakhe
6–24 Wetinyanga

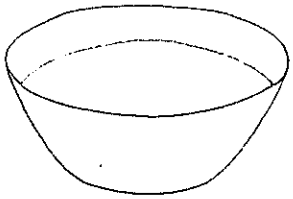
"FROM SIX MONTHS, CHILDREN SHOULD HAVE THEIR OWN PLATE"
AS THE CHILD GETS OLDER, THE AMOUNT OF FOOD MUST INCREASE.

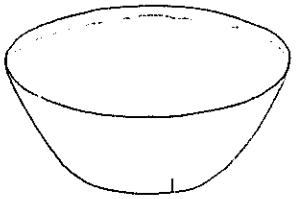
6 - 12 wetinyanga

12 - 18 wetinyanga

18 - 24 wetinyanga





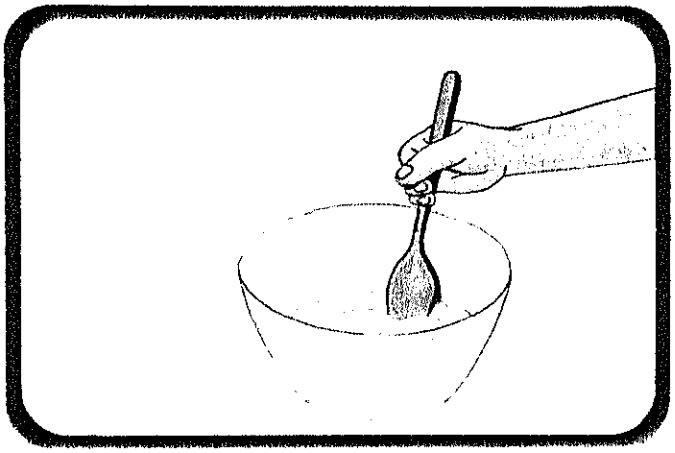


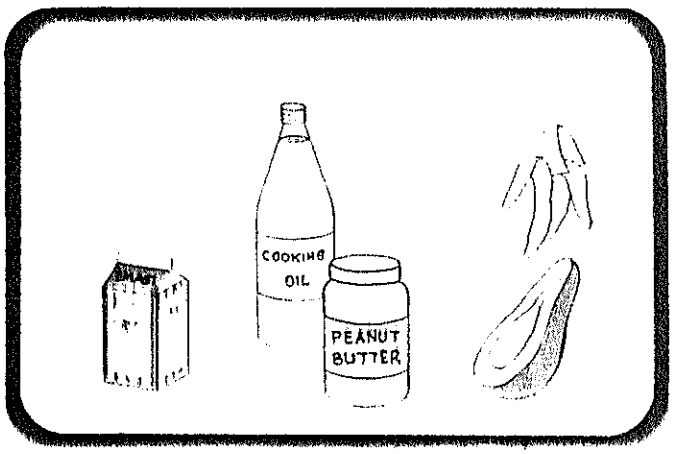
4–6 Wetinyanga

4-6 Months - Gaining weight and healthy

4–6 Wetinyanga

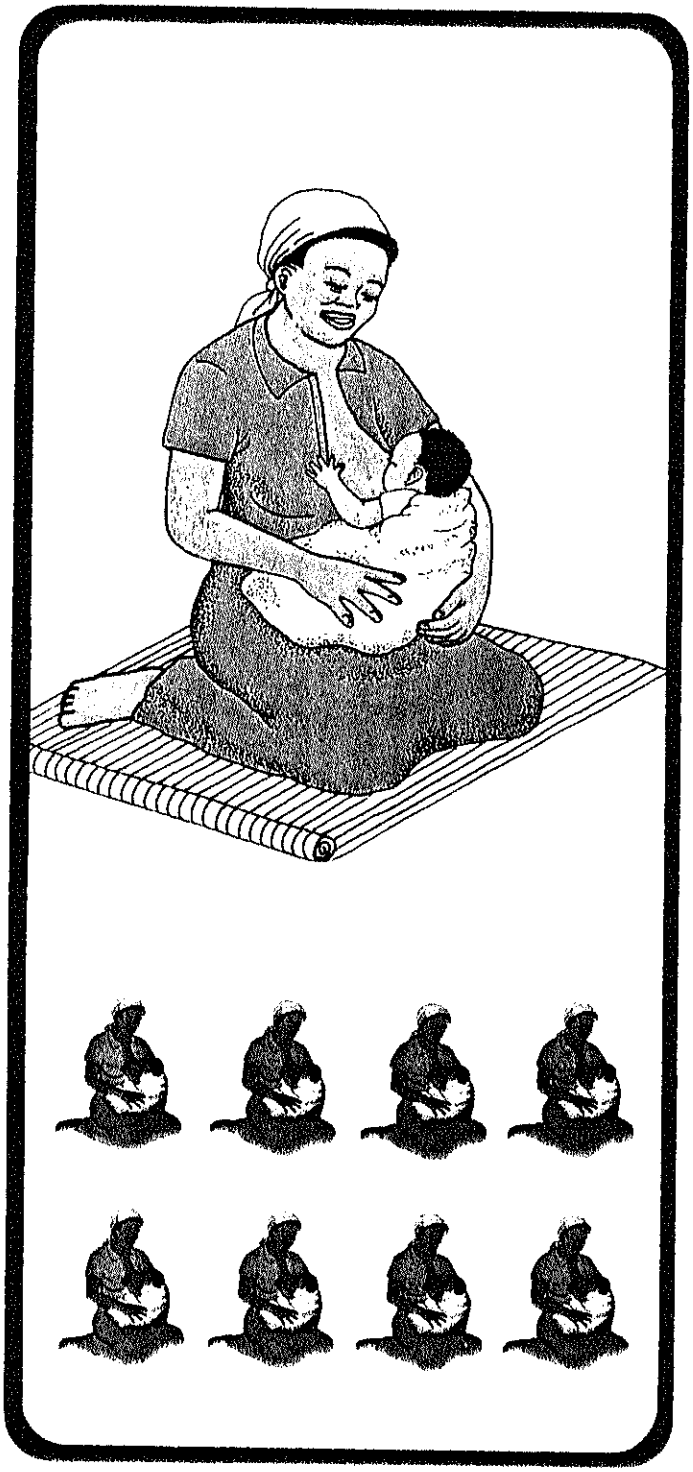
4-6 Months - Not gaining weight and/or recuperating from an illness

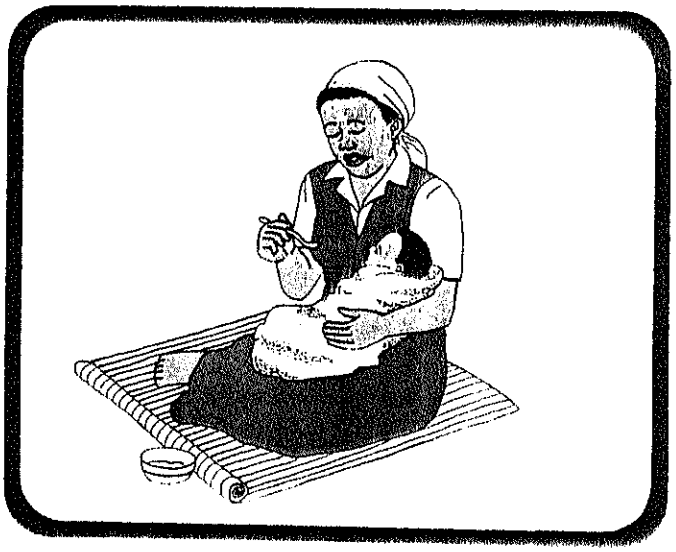


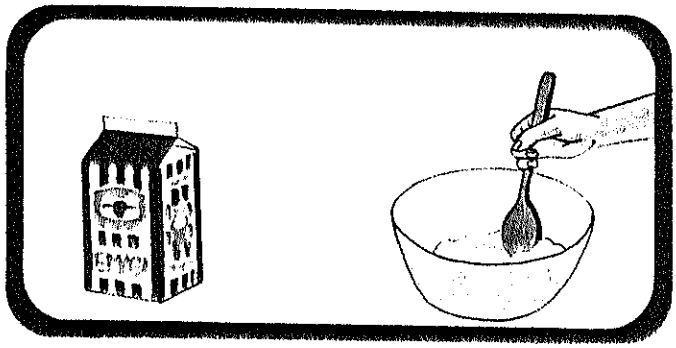


4–6 Wetinyanga

4-6 Months - Not gaining weight and/or currently ill







Besides the many specific changes that emerged from the pretesting, the pretests in general showed:

- the overwhelming preference for the use of SiSwati language for the text on both cards and flip charts;
- recognition of many of the images as urban and therefore as "unusual";
- surprise at the deliberate inclusion of fathers assisting mothers with child feeding tasks in many of the images in the flip chart;
- lack of recognition of "incomplete" body images, such as a breastfeeding woman with her legs tucked under her in a sitting position--women thought it was interesting to see a disabled person breastfeeding.
- a strong preference for using red for sick children; a less definitive color preference for healthy or recuperating children, possibly due to a lack of differentiation among colors inherent in SiSwati cultural and linguistic tradition;
- recognition of several "un-Swazi" characteristics of images, such as cooking pots placed directly on mats, types of bowls and cooking utensils, and furniture;
- children depicted not looking ill or the age stated in the text.

Several additional design concerns, although not included in the pretesting, were also addressed by project staff. These included creation of a time line or age graph on each counselling card to clarify the age of the child the message is intended for and continuity of image and text throughout all materials. All of these changes were made and the materials were printed and laminated. Following is a list of the elements in the flip chart and the cards in the counselling set.

Flip Chart: **Know How to Feed Your Baby**

- **From Birth through Four Months Infants Need Breast Milk Only**
  Mothers Need to Eat and Drink More; Breastfeed Frequently and Seek Advice for Problems
- **Introduce the Infant to Soft Foods From 4-6 Months**
  Mothers Continue Breastfeeding; Soft Foods Are Mashed Fruit or Vegetable in Indegane
- **From Six Months Children Get Food from the Family Pot**
  Feed Family Foods Five Times/Day and Continue Breastfeeding

- **Feed Your Child Other Foods in Addition to the Meals**
  Continue Breastfeeding, Give Gmasi, Offer Snacks

- **From Six Months Children Should have their Own Plate**
  As the Child Gets Older, the Amount of Food Must Increase

- **The Sick and Recovering Child Needs Special Attention**
  Continue Breastfeeding, Give More Frequent Meals and Offer Special Foods

- **Pay Attention to Cleanliness**
  Wash Hands, Cover Food and Sweep Away Debris

Counselling Cards

- Initiation of Breastfeeding
- Complaint of Not Enough Milk
- General Hygiene
- ORS Recipe
- Birth to 4 Months - Healthy
  Not gaining weight or recuperating from illness
- 4-6 Months - Currently ill
  Healthy
  Not gaining weight or recuperating from illness
- 6-12 Months - Healthy
  Not gaining weight or recuperating from illness
- 6-24 Months - Currently ill or no weight gain for 3 or more months
- 12-24 Months - Healthy
- 12-18 Months - Not gaining weight or recuperating from illness
- 18-24 Months - Not gaining weight or recuperating from illness

In addition to the print component, a radio component was designed to reinforce key child nutrition messages. A signature tune using a popular musical style was developed and recorded. The plays, short stories, and vignettes prepared in late 1988 needed revision to

assure that the key messages were in fact transmitted in a standardized and technically correct manner. The MOAC person responsible for the radio component had many other assignments during this time and was unable to complete this work when it was scheduled.

IMPLEMENTATION

Implementation began in August 1989 with in-service training for home economists and clinic nurses. The training for Rural Health Motivators (RHMs) was postponed and made into a second phase because the PMC wanted to be sure clinic nurses were well versed in the use of the materials before they were introduced to the RHMs. The one-week training consisted of an update on the latest concepts in infant and young child nutrition, preparation in counselling and communication techniques, and the use of the actual materials.

With the initial training and a short burst of publicity about the project, it was launched. Since September 1989 (the end of the A.I.D.-supported Weaning Project), the in-country team has continued training community-based workers and putting materials in their hands. The home economists have taken on young child feeding as one of their major activities. Male agricultural extension workers, much to the surprise of many people, are enthusiastic about using the materials and discussing the messages. All nurses from all regions and some RHMs have been trained. SINAN, the NGO supporting breastfeeding, was also trained and is using the counselling cards. T-shirts have been printed for community workers from the computer images with the project logo and messages. By 1991, the radio spots were produced and were being aired regularly. This completed the implementation of the planned basic package of communications activities.

Two other activities that were key elements of the original strategy were two products that were to be marketed as part of the project. The first, a plastic child feeding bowl, has never been implemented. There were no project funds to buy utensils currently in the market and convert them to what the project had in mind. The manufacturer of plastic products in Swaziland initially was interested in the idea of the bowl but later went out of business.

The second product, the malt to thin the family porridge for a young child, was taken over by another project but never developed. Later, the director of the Swaziland Young Child Feeding Project incorporated parts of the original plan for developing the malt into food security work that has British support.

Implementation, like the development of the project strategy, has proceeded slowly but steadily. Through the dedication of a few individuals in Swaziland and multiple donor support, activities to improve young child feeding practices have become an important part of development programming in Swaziland.

EVALUATION

In the standard methodology of TWP, an impact evaluation of the project consists of a baseline survey scheduled just prior to launching public education activities and a follow-up survey approximately 18-24 months later. The Swaziland project team studied examples of surveys from other TWP sites in planning its own evaluation.

In discussions about the evaluation, there was agreement that it would have to be extremely simple. There was a limited budget ($15,000) and the project team and their collaborators felt they could not undertake another major research activity.

Since the project was to be implemented nationwide, there could not be project and control areas but only a pre and post comparison. Both families and health workers/home economists would be interviewed. The initial plan was that the sample be drawn from each of the four districts and be large enough to give the statistical power needed for comparisons (an estimated 400 to 600 household with children under two years of age). The following indicators were proposed for the evaluation:

- program participation: both coverage and intensity of participation or contact:
- change in knowledge and attitude related to specific program messages;
- change in practice related to those behaviors targetted for change;
- change in dietary intake; and
- change in nutritional status.

The project board of directors and other members of the National Nutrition Council considered this plan to be too complicated and at a minimum wanted to eliminate the last two measures. Several alternative approaches were considered: contracting out the evaluation (which would require more money), using a cluster survey technique that could reduce the sample, or relying on spot monitoring surveys and not undertaking a large evaluation study.

The final choice was to contract with the University of Swaziland to conduct the baseline survey. This was done with collaboration from the project director in the MOAC. Plans for a follow-up survey have not been determined.

DISCUSSION AND LESSONS LEARNED

This project was extremely successful in increasing technical understanding of young child feeding and strategies for improving it in Swaziland. The level of understanding among nutritionists and public health officials was clearly enhanced. There is now a program plan

for young child feeding that integrates breastfeeding and first foods and weaning food and weaning practices. In addition to improved understanding of young child feeding, social marketing and communications skills were enhanced including new capabilities in qualitative research, communications, and computer-generated graphics.

By design, the Swazi project was a collaborative one. By virtue of the fact that it was a National Nutrition Council project, it involved several implementing agencies. It also combined funding from several donors. While the collaborative nature of the project was at times problematic and often caused delays, in the long-run it was probably the best way to work to ensure broad understanding and support for child feeding, ownership of the project and a chance for its continued funding beyond the life of The Weaning Project's technical assistance.

It must be noted that there was a lead agency and in that agency, a leader. The Ministry of Agriculture was the backbone of the project and its nutritionist the leader. The Swaziland project can serve as an example of what can be done by a Ministry of Agriculture for young child feeding. However, the MOAC's strength in calling on other ministries and groups resided in its leadership position on the National Nutrition Council. The MOAC has been farsighted in its inclusion of nutrition concerns in its programming.

One of the principal problems encountered in development and implementation was the delays at every stage. This was due in large part to the fact that project personnel were only part-time. They had many other responsibilities. For the MOH nurses, these other responsibilities included clinic work. The bright side of the picture is that a high percentage of those who worked on project development had important roles in implementation, and they were committed to the project's success because they were well informed about its development.

The collaboration between two donors--UNICEF and A.I.D.--worked well. UNICEF provided project support for in-country activities and assisted with day-to-day management. Initially, its nutritionist spent much of her time on the project and later a local public relations/journalist was hired to assist. The A.I.D.-supported Weaning Project offered technical assistance when the PMC felt it needed it. At the outset, the project plan was reviewed and the Swazi team indicated where they wanted skills development. The assistance from UNICEF was critical to project continuity during some of the delays and to enabling the Swazis to produce the type of high quality reports and materials that they felt the development process merited. This collaboration was ideal and built a stronger partnership than usually occurs in these projects because all the money for local costs was given directly to the Swazi team. It should be a prototype for other countries.

REFERENCES (chronologically)

Griffiths, Marcia. Project Preparation and Assessment Design. Staff trip report, 29 September - 17 October 1986. Washington, DC: Manoff International (TWP).

Griffiths, Marcia. Focus Group Analysis and Project Monitoring. Staff trip report, 16 March - 2 April 1987. Washington, DC: Manoff International (TWP).

Green, Edward. Ethnography Preparation. Consultant trip report, 26 October - 13 November 1987. Washington, DC: Manoff International (TWP).

Griffiths, Marcia. Focus Group discussion Report, Household Interview Report, and Household Trials Implementation. Staff trip report, 11 February - 9 March 1988. Washington, DC: Manoff International (TWP).

Griffiths, Marcia. Concluding the Assessment Phase and Planning Communications Strategy. Staff trip report, 8 June - 1 July 1988. Washington, DC: Manoff International (TWP).

National Nutrition Council--Swaziland. Literature Review. Project for Promotion of Improved Young Child Feeding. Mbabane: NNC and UNICEF, 1988.

National Nutrition Council--Swaziland. Focus Group Discussions. Project for Promotion of Improved Young Child Feeding. Mbabane: NNC and UNICEF, 1988.

National Nutrition Council--Swaziland. Household Observations and Trials. Project for the Promotion of Improved Young Child Feeding. Mbabane: NNC and UNICEF, 1988.

National Nutrition Council--Swaziland. Summary Report. Project for Promotion of Improved Young Child Feeding. Mbabane: NNC and UNICEF, 1988.

Tisa, Benedict. Project Preparation and Materials Design. Consultant trip report, 20 June - 15 July 1988. Washington, DC: Manoff International (TWP).

Tisa, Benedict. Materials Design and Production. Consultant trip report, 10-29 October 1988. Washington, DC: Manoff International (TWP).

Moore, Mona and Marcia Griffiths. Project Monitoring and Materials Pretesting. Staff trip report, 28 March-15 April 1989. Washington, DC: The Manoff Group (TWP).

Aphane, Juliet. The Promotion of Improved Young Child Feeding in Swaziland. Presentation at the XIV International Nutrition Congress, Seoul, South Korea. August 1989.

Tisa, Benedict. "Picture Perfect: Generating Graphics Electronically". Development Communication Report, Vol. 73, 1991, pp. 10-11.

APPENDIX A

Summary of Household Trials

WHAT CAN BE DONE TO IMPROVE YOUNG CHILD FEEDING

AGE SPECIFIC BEHAVIOUR CHANGES RECOMMENDED DURING INTERVENTION TRIALS

BIRTH - 4 MONTHS

PROBLEM	RECOMMENDATION	INFORMATION MOTIVATION	RESULTS OF TRIAL
Mother does not initiate breast-feeding immediately after birth, discards colostrum and gives water.	• Initiate breastfeeding immediately, even if colostrum has not started flowing. • Give colostrum--not water.	• Child will thrive until colostrum comes in • It is beneficial to the child. • The very first milk is like an immunisation. It will protect the child. • Baby's sucking makes milk come more quickly.	• Mothers in hospital maternity wards agreed to give breast milk at delivery and no water.
Mother is giving non-breast milks/ cereal to her child	Exclusive breastfeeding: stop all milk and liquid feeds: stop all bottlefeeds: increase breastfeeding frequency.	• Breast milk is the best. • Breast milk alone will satisfy the child. • Other feeds may be contaminated by germs that cause diarrhoea and other illnesses. • Breast milk will increase if feedings are more frequent.	• Mothers could not stop other foods/bottle-feeding--only decrease frequency. They said the child cried too much.

BIRTH - 4 MONTHS

PROBLEM	RECOMMENDATION	INFORMATION MOTIVATION	RESULTS OF TRIAL
Mother complains of having insufficient breast milk. --Mother is using only one breast at each feed or favors one breast. --Mother is nursing child less than five minutes per breast --Mother is not breastfeeding her child often enough.	● Breastfeed on demand 8-10 times during the day ● Breastfeed completely: --both breasts at each feed or alternate breast; --empty breasts; --wind the child	● Frequent breastfeeding will help to produce more milk ● If the mother feels she is not producing enough milk then encourage her to drink more fluids ● Full breastfeeding for longer periods and emptying breasts completely will leave the child more satisfied, he will cry less often and mother is freer. ● Frequent, complete breast-feeding means better contraception	● Mothers were able to breastfeed for longer duration, but complained that it took time.

4-6 MONTHS

PROBLEM	RECOMMENDATION	INFORMATION MOTIVATION	RESULTS OF TRIAL
Mother is not breastfeeding often enough (less than 6 times during the day) or is not fully breastfeeding the child and complains of having insufficient breast milk.	• Breastfeed: -- 2-3 times more each day (at least 6 times) -- Fully breast feed: empty both breasts -- Breastfeed before giving food • Mother should drink more fluids • Always give breast milk before offering other foods	• Breast milk is the best food and is still important for the child • Full breastfeeding will satisfy the child and so mother will be freer. • Enough milk is produced with frequent breastfeeding • Frequent, complete breastfeeding means better chance of contraception	• No trials of breastfeeding
Child's food is too thin	• Give less watery food: thicker *indengane* with milk and sugar. • Give family foods: soften *liphalishi* with: --gravy, *ligusha* or mashed avocado --1/4 tsp. malt*	Child gets family food so there is no extra work. • Family food is less expensive than specially bought food. •Family food can be made soft. • Family food is good food and is needed to make children strong.	• Trials with *liphalishi* and malt were successful. • Mothers stopped more liquid foods. • Mothers also gave milk powder, *emasi* and bean soup with *liphalishi*.

* Germinated Sorghum (Malt)

The addition of germinated sorghum (malt) to *liphalishi* (thick porridge) transforms it to the consistency of *indengane* (thin porridge) but with the energy content of *liphalishi* (2-3 times that of *indengane*.) A small amount of the malt (about 5% or 1/2 teaspoon to one cup of *liphalishi*) makes a consistency acceptable to the mother and child.

This softening action is achieved by enzymes formed in the sorghum during germination. The enzymes break down the starch molecules of the *liphalishi*, thus reducing its stiffness.

The malt is readily available and the small amounts of malt involved here mean that the costs are affordable by most households.

4-6 MONTHS (continued)

PROBLEM	RECOMMENDATION	INFORMATION/ MOTIVATION	RESULTS OF TRIAL
Child is not getting semi-solids.	● Mother begins soft foods: --takes food from the family pot and to begin with feeds a few spoonfuls twice/day. --At five months. 1/4 cup 2-3 times/day	● The child needs to learn new tastes: he is growing and will soon need food to grow more ● The child can swallow and digest soft food at this age. ● Begin gradually and with patience. ● The amounts of food are small.	● No trial--all children receiving foods.
Mother is feeding milk/ *indengane* from a bottle	● Stop bottlefeeds and give food in a cup with a spoon.	● Feeding with a cup and spoon is cleaner than with a bottle. ● With a cup and spoon the child will not run his teeth.	● Mothers unsuccessful in stopping feeding.

PROBLEM	RECOMMENDATION	INFORMATION/ MOTIVATION	RESULTS OF TRIAL
Mother is not breastfeeding often enough	• Breastfeed at least four times during the day • Both breasts at each feed or alternate breasts for each feed • Empty breasts completely at least four minutes per breast	Breast is still important for child to stay healthy • Breast milk protects child from diseases like diarrhoea • Breast milk is food for the child, not just a pacifier	• No trials on improving breastfeeding • Most trials to stop bottle and give food in a cup were successful
Child is not receiving sufficient nutrients for his needs (food no nutrient dense-- too dilute)	• Give *liphalishi* mashed with one of the following -- Relish, not just gravy (2 tablespoons) -- Peanut butter (2 heaped teaspoons) -- Oil or margarine (1 tsp) plus relish • Give *liphalishi* thinned with 1/2 tsp malt and add one of the following -- peanut butter (2 heaped teaspoons) -- relish, not just gravy (2 tablespoons)	• Child must learn to eat everything that the family eats. • Child is now able to swallow thick food • Child must learn how to chew	• All trials with malt were successful. • Trails with adding relish to *liphalishi* were successful because mothers thought it important to teach their children to eat family food. • A few mothers could add oil and only one could add peanut butter.

6-12 MONTHS (continued)

PROBLEM	RECOMMENDATION	INFORMATION/ MOTIVATION	RESULTS OF TRIAL
Child is not receiving enough food at each meal for his meals	• Increase the amount the child eats by 1/4 cup per feed (total amount 3/4 cup or up to the amount of <u>at least</u> 4 cups per day • Mother must remember how much the child is eating during a day	• Child needs a lot of food to grow well • When child loses interest he can still be encouraged to eat more	• Most mothers were able to increase amount of food to a half cup per serving or by one to one and a half cups per day
Child is receiving too few meals	• Increase feeding to five times per day	• Child's stomach is small and fills up before child has had enough for his needs	• Mothers were able to increase frequency by two times/day. Some mothers reached six feedings per day.

12-24 MONTHS

PROBLEM	RECOMMENDATION	INFORMATION/ MOTIVATION	RESULTS OF TRIAL
Child is not receiving the right quantity of food	• Every time child eats he should get one full cup of food (5 cups per day) • Child should eat from his own bowl and mother compare amount of food offered to amount eaten • Mother to remember how much food the child gets over the day	• Child is growing so he needs to eat lots of food • Mothers are not aware of quantity--difficult to estimate and remember so measure to be sure • Persist with child if he loses interest	• Over half of mothers were able to increase amount per meal to half a cup. Those that did not were concerned with wastage • Most mothers found a bowl for their child and tried to measure the food
Child is not eating sufficient variety of food	• Child should eat *liphalishi* mashed with whatever relish the family eats or with peanut butter	• Child needs to get used to all different foods eaten in the family • Cooking becomes simpler if child eats family foods mashed up	• Almost all mothers were able to increase the amount of relish • Several mothers increased oil added to relish
Child is not having enough meals a day	• Increase feeding to five times per day	• Child's stomach is small so it gets full before the child has eaten enough for its needs	• Majority of mothers able to increase feeding frequency by at least one time/day. Most reached 4 meals. Other mothers able to increase snacks by two per day.
Child is not being breastfed often enough	• Breastfeed at least three times during day • Both breasts at each feed or alternate breasts for each feed • Empty breasts completely--at least four minutes on each breast	• Breast milk is important for child to keep fresh, healthy • Breast milk is food, it is not a pacifier	• Mothers could increase breastfeeding duration but not frequency because they said they were too busy.

SICK AND RECUPERATING CHILDREN OF ALL AGES

PROBLEM	RECOMMENDATION	INFORMATION/ MOTIVATION	RESULTS OF TRIAL
Child needs increased fluid and must continue to eat	(Mother breastfeeding) ● Increase frequency to 3-4 more times than is currently practiced--or as often as child wants if more frequent (Child is four months or not being breastfed) ● Give a cup of ORS/SSS every time the child has diarrhoea or vomits. Give ORS/SSS in a cup, not a bottle	● A child who is sick needs food so that he will not become weak ● Breast milk is easily digested and will not aggravate the illness, even serious diarrhoea ● Sick children, especially those with diarrhoea, need a lot of fluid to replace lost fluid and to prevent them from becoming weak and dehydrated ● Breastfeeding may calm a fussy, sick child ● The child needs fluid but because of illness may not want to drink. Encourage the child to drink for his own sake	● No trial

SICK AND RECUPERATING CHILDREN OF ALL AGES (continued)

PROBLEM	RECOMMENDATION	INFORMATION/ MOTIVATION	RESULTS OF TRIALS
Mother not encouraging child to eat or to eat enough	(Child is eating but has little appetite) ● Give smaller, more frequent feeds--as often as 6 times a day ● Give the child soft food: change to *incwancwa* or *indengane*. ● Give what the child likes ● Give sour foods: --*emasi* and *liphalishi* ● Sit with the child and feed the child	● This child must continue to eat to maintain strength and to prevent weight loss. All efforts must be made to persuade the child to eat. ● Children often refuse food because they do not feel well, but that does not mean they do not want or need it. ● Children will often look and feel better if they eat something ● Sour foods are known to increase appetite ● For your child's sake ● It is worth spending extra time on feeding your child. He will get better more quickly and not lose weight.	● Trials with giving *incwancwa* not successful. Mothers did not like it. ● One trial with *liphalishi* was successful.

SICK AND RECUPERATING CHILDREN OF ALL AGES (continued)

PROGRAM	RECOMMENDATION	INFORMATION/ MOTIVATION	RESULTS OF TRIAL
Mother is not aware that the child needs more food to "catch up" after illness.	● <u>During recuperation</u>: --follow recommendations for each age group ● If feeding according to age group "standards" -- add one more meal for one week ● offer the child "special" energy-rich foods: --peanut butter; -- oil; -- meat; --relish●	● The child has been ill & must regain his strength and weight ● It is important to begin feeding more immediately the child begins to feel better ● Special attention should be given to the child's food esp. the quantity and frequency ● If any special food can be purchased or used for the child, this is the most important time to do it.	● No trial

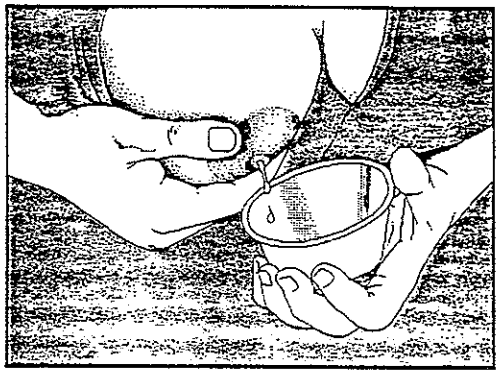
Picture Perfect: Generating Graphics Electronically

by Benedict Tisa

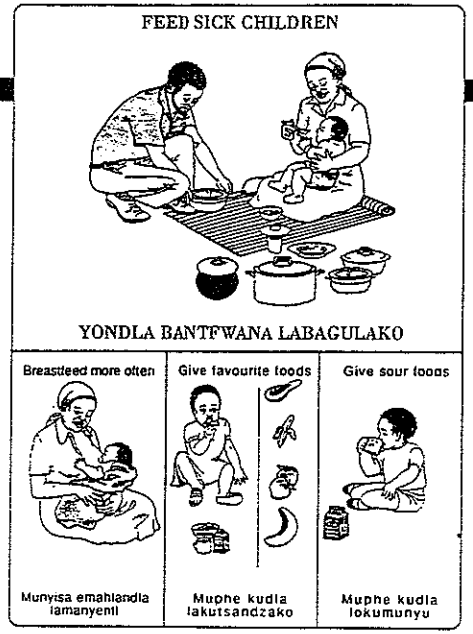
Educators who prepare printed educational materials for use in Third World countries commonly encounter difficulty in preparing art work. Over the years, some attempts have been made to supply visual models which might make the job of drawing easier for project workers with limited training. However, these models have not proven to be very effective when "camera-ready" materials – that is, ready in size and quality for the printing process – are needed. It has also proven difficult to adapt materials which have been successfully used in one region or country to one which is ethnically or culturally different, because the models may not easily lend themselves to change. Instead, project workers usually are forced to start from scratch. This is not only time-consuming, but also costly.

Faced with many of these problems, the Swaziland Project for Promotion of Improved Young Child Feeding found a solution by using a MacIntosh computer and modest graphic software. The project, which began in 1986, was implemented by the Swaziland Ministries of Health and Agriculture, with technical assistance from UNICEF, U.S. Agency for International Development and the Manoff Group. During the project design stage, we decided to produce various printed materials to promote good child feeding practices, including flip charts and counseling cards. Faced with time constraints, lack of graphic materials and people to produce them, we resorted to using MacIntosh computers at the Ministry of Agriculture. There were several advantages to using computer-generated graphics:

- Any revisions needed could easily and quickly be done on the computer screen. There was no need to make entirely new drawings or to re-photograph.
- The images were realistic and contained detail that is usually only captured in photographs.
- Time and money spent in graphic preparation were saved, since the computer print-outs were taken directly to the printer for mass production.
- The same images could be enlarged or reduced for a variety of formats.
- The image bank was made available to both the Ministry of Agriculture and the Ministry of Health.



The illustrations on these pages were generated by computer for the Swaziland Project for Promotion of Improved Young Child Feeding.



Simpler and More Flexible

There were several steps involved in creating visual materials by computer. First, we decided on the form, context, and use of visuals based on an understanding of the audience's attitudes and practices. Then an artist at the Ministry of Agriculture was trained to use the new computer graphics equipment and scanners. The scanner operates somewhat like a copy machine, except the images are converted into electronic codes which appear on the computer screen. On screen, the images can be changed and adapted as needed using the computer graphics programs. Images could be turned into line drawings or half-tones (which use a dot pattern to create variegated shades, as in a photograph) and generated through computer print-outs.

At this point, we collected images that were needed, drawing on already existing images and photographs taken specifically for the project. The images were scanned, adapted and draft copies were generated. The drafts were reviewed and pre-tested, and adapted as needed. The revised images were printed on a laser printer, which makes a very detailed image and delivered to the printer as camera-ready. Colors were assigned when the offset negatives were produced. There was no need for outside graphic services and little paste-up work required.

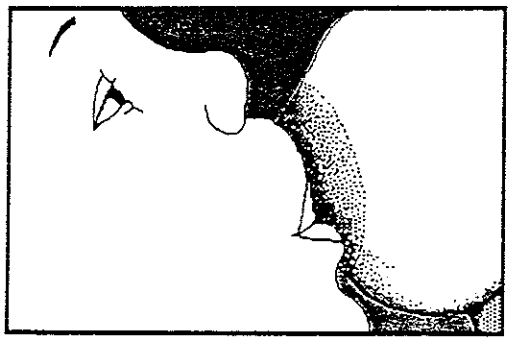
During the life of the project, materials in several formats were developed. In addition to a flipchart, poster and hand outs, the project also used computer graphics to experiment with various other media forms such as rubber stamp images, children's coloring pages, and crossword and activity pages for the schools. All materials were produced at a cost lower than using traditional graphics. In addition, the project could produce new materials using the same images, as needed, thus reinforcing the messages.

More Than a Word Processor

It is now common for projects and programs of all sizes to have a computer. It is also important to remember that computers can be used for tasks other than word processing and data storage. As our project demonstrated, the use of computer graphics to produce project support materials has simplified a sometimes costly and complex task.

Aside from saving time and money, using the computer also allows the production of specialized audiovisuals from the image bank. Handouts and flyers can be produced from images in the bank and copied in small numbers on the photo copy machine. High quality editions of trained materials can be produced easily and quickly in small quantity for workshops and seminars. Materials tailored to the special needs of a situation can be made by the field workers themselves, since the program is both simple and economical to use. The potential of the system is just being recognized. ■

Benedict Tisa is a communications consultant who has worked with computer graphics for the production of educational materials in Swaziland, Tunisia, Niger and Haiti. For further information, contact him at 45 Haddon Ave., Westmont, New Jersey 08108, USA. Telephone and fax: (609) 854-6983. Electronic mail: Compuserve 71650,23.



Price Tags

How much does computer graphics equipment cost and is it a worth-while expenditure? In Swaziland, we had access to equipment used by the Ministry of Agriculture and personnel that could be trained. But for most projects, it might be difficult to justify purchase of equipment solely for production of print materials. A purchase would be more cost-effective if the equipment is also used for word processing, data collection and desktop publishing.

Minimum equipment and software for start-up would include:

- a personal computer with 8-megabyte Random Access Memory (RAM), 60 megabytes of hard-drive storage, a keyboard, a "mouse," and floppy disk drive (cost – approximately US $4,300);
- a dot matrix printer for drafts and data ($250-$650), and a laser printer ($2,500-$4,000);
- a scanner for copying illustrations and text ($300-$2,000);
- various software ($500); and
- filters, breaker cables ($80-$1,000) and supplies such as diskettes, toner, paper, etc. ($1,000).

Depending on whether there is a need for technical assistance, the total cost for start-up would run between $10,000 and $30,000. There would also be the additional cost of hiring and training personnel to operate the system.

–B.T.