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Communication for Vitamin A:
Field Study in Macina

November 28-December 5, 1989

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NUTRITION COMMUNICATION PROJECT

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PREFACE

This study was carried out by anthropologist Katherine A. Dettwyler, Ph.D., as part of a Vitamin A Education Project being conducted by the Academy for Educational Development in collaboration with CARE. The research was conducted with the agreement of CARE/Mali officials in Macina, Bamako, and New York, and with the approval of Mr. Djibril Semega, Director of the Nutrition Service of the Division Nationale de Sante Publique, Bamako, Mali.

K. Dettwyler, assisted by Moussa Diarra, developed the questionnaire and pre-tested it in Bamako. M. Diarra served as the Bambara/English and French/English interpreter when necessary. K. Dettwyler analyzed the results and prepared the report. For the survey in Macina, CARE monitrices Daffa Diallo and Mariam Famanta helped with data collection, and Salim Traore provided transportation. CARE officials in Bamako (Kathy Tilford, Lisa Nichols, and Catherine McKaig) and Macina (Mark Chorna, Daffa Diallo, and Mariam Famanta) participated in the design of the survey, and in discussions about the in-depth study to be carried out in February and March of 1990.

EXECUTIVE SUMMARY

This report is the result of a week-long preliminary study of factors affecting Vitamin A nutrition and traditional beliefs about infant feeding in six villages participating in the CARE/Mali program in the Cercle of Macina, Region of Ségou, Mali (West Africa). This study represents the first research activity of a broader program being carried out by the Nutrition Communication Project (NCP) with funding from A.I.D.'s Office of Nutrition. The goal of the Mali Communication for Vitamin A Project is to develop culturally and environmentally appropriate nutrition communication materials to promote the consumption of Vitamin A-rich foods. The field research was carried out between November 28th and December 5th, 1989 under the direction of NCP consultant, Katherine Dettwyler, a nutritional anthropologist from Texas A&M University.

Infant feeding practices can be summarized as follows: most children begin solid foods between 6 and 12 months, most toward the latter end of that range, beginning with millet moni (porridge) as their first food. The adult staples of millet (toh) and rice (kini) are added to the diet between 12 and 18 months of age. Most children are weaned between 18 and 24 months of age, most toward the latter end of that range. A subsequent pregnancy is the only socially acceptable excuse for weaning a child "early."

Within the family, children are reported to have first access to meat and fish in the sauce, and most mothers said they decide how much food the child should eat. However, these attitudes are not manifested in observed behavior. Sick children are said to lose their appetites, and are usually offered moni if they don't want to eat kini or toh. Techniques for encouraging children to eat more food are not well-developed. Children are seldom, if ever, actively encouraged or forced to eat.

Night blindness is a well-known disease entity in the villages of Macina. It is thought to primarily affect pregnant women, but is also seen in young children and old people. Most people think that it is caused by excessive exposure to bright sunlight, and the most common cure is to eat goat liver (an excellent source of Vitamin A). The fact that everyone is familiar with the disease, and knows of actual cases suggests a level of deficiency that would be considered a public health problem if measured directly.

Very few Vitamin-A rich foods were available in Macina during the season this study was conducted, which makes it difficult to promote the consumption of these foods without also providing some means of making them available (gardens, new supply sources for markets, etc.). Most of the vitamin A-rich foods consumed during this season are eaten dried. The introduction of shade drying instead of sun drying would help preserve the Vitamin A which is available. Vitamin A-rich foods such as deep-orange sweet potatoes, carrots, spinach, nporon, hot red peppers and squash are

potential sources if they can be grown during the rainy season or in gardens watered by wells during the cool/dry seasons. Mangoes provide sufficient Vitamin A for most of the population during the hot season only (March-May/June).

Results from the preliminary study suggest that a long term solution to Vitamin A deficiency in this region is likely to require:

- 1) increased promotion of demand for Vitamin A-rich foods, particularly during pregnancy and lactation;
- 2) increased seasonal supply through trucking-in or garden incentives;
- 3) promotion of shade-drying rather than sun drying of vegetables sources; and
- 4) a combination of messages which address general improvements in infant feeding practices as well as those focused on consumption of Vitamin A-rich foods.

The in-depth study in March should focus on confirming and clarifying the infant feeding beliefs and attitudes reported here, especially with regard to actual practice, and regularity with which children are fed once they have begun solids. Additionally, food proscriptions during pregnancy need to be explored, as pregnant women are reported to suffer most from Vitamin A deficiency. More thorough market surveys and seasonal availability questionnaires will provide information on which foods might be promoted during different times of the year. The feasibility and acceptability of shade-drying of foods also needs to be thoroughly examined.

In the interim, CARE monitricers will conduct observations on several specific vitamin A-related behaviors based on Guidelines for Observations developed by Katherine Dettwyler and based on the orientation they received in December (See Appendix).

INTRODUCTION

This report is the result of a week-long preliminary study of factors affecting Vitamin A nutrition and traditional beliefs about infant feeding in six villages participating in the CARE/Mali program in the Cercle of Macina, Region of Ségou, Mali (West Africa). This study represents the first research activity of a broader program being developed by the Academy for Educational Development's Nutrition Communication Project, CARE, the MOH and HKI. The communication project is designed to develop culturally and environmentally appropriate nutrition communications to promote the consumption of Vitamin A-rich foods. The study was carried out between November 28th and December 5th, 1989 under the guidance of Katherine Dettwyler, a nutritional anthropologist from Texas A&M University.

Vitamin A deficiency has received a lot of attention from nutrition programs in the Third World for two reasons. The first is that Vitamin A deficiency can lead to permanent blindness, which is easily preventable through the increased consumption of Vitamin A-rich foods or through capsule distribution. The second is because of the apparent link between Vitamin A deficiency and increased morbidity and mortality among young children. Vitamin A plays a vital role in maintaining the health and integrity of the body's mucous membranes, which line the respiratory and gastrointestinal tracts. Children with even mild Vitamin A deficiency develop respiratory diseases and diarrhea at two to three times the rate of children with normal Vitamin A status, and mortality from these diseases is higher in deficient children as well. Studies in Indonesia claim a 34% reduction in childhood deaths as a result of a Vitamin A capsule distribution program.

Just as oral rehydration solution has reduced infant and childhood mortality rates due to dehydration, it is hoped that improved Vitamin A nutrition will reduce the number of deaths from diarrhea and respiratory illnesses, even in otherwise malnourished children. Thus, although one of the first symptoms of Vitamin A deficiency is "night blindness" the primary significance of eliminating Vitamin A deficiency lies in its potential impact on morbidity and mortality rates among infants and children.

As part of an integrated nutrition education program, information which leads to the increased consumption of Vitamin A rich foods will also result in children who are better nourished in general. Likewise, any improvements in the overall feeding strategies for children in a community will result in children who are less at risk for Vitamin A deficiency. Therefore, in addition to looking specifically at factors affecting Vitamin A consumption, this study also addressed general infant/child feeding practices in the communities, and local beliefs about the causes of malnutrition. Recommendations for the in-depth study in March 1990 and for the nutrition education program are provided at the end of this report.

OBJECTIVES

The primary objective of the study was to assess consumption practices, attitudes and beliefs in Macina relevant to Vitamin A deficiency. The findings would be used to develop a detailed research strategy and guidelines for the in-depth study to be conducted in March 1990. The secondary goal of the activity was to train two CARE monitrices in qualitative, ethnographic techniques for studying the beliefs and practices of community members relating to nutrition, so that they can help with the March 1990 study, as well as future research on other topics.

The study involved a number of different but related activities, including interviews (both focus groups and individuals), observations, market surveys, and a limited number of arm circumference measurements and screening for kwashiorkor. Specific objectives for each activity are listed below:

Interviews

1. To field-test the questionnaire (SEE APPENDIX A) in detail, so that it can be improved and revised prior to the in-depth study.
2. To briefly survey the levels of childhood mortality and most frequent causes of death in the communities studied.
3. To describe the current/traditional infant feeding practices of the communities, including:
 - a. age when solid foods are first given to infants, and the rationale for starting solids at that age
 - b. what solid foods are first given to infants, and why
 - c. age when children are first given the adult staples
 - d. what foods are considered inappropriate for young children, and why
 - e. age when children are weaned (no longer allowed to nurse), and the rationale for weaning at that age
 - f. how the child is fed (who feeds him, who decides how much he should eat, whether he eats from a communal bowl, access to protein sources)
 - g. what parents do when the child doesn't want to eat
4. To assess maternal perceptions of malnutrition, based on the traditional disease terms "fasa," "sere," "funu-bana," and "ngunam-ba," and to identify local variations of these terms.
5. To assess maternal perceptions of night blindness in the community, including its symptoms, whether it is recognized as a major health problem, its cause, and its cure.
6. To determine the usefulness of using photographs of the eyes of Vitamin A deficient people to elicit information about the prevalence of severe Vitamin A deficiency.
7. To determine the typical daily diet of community members, the seasonal availability of Vitamin A-rich foods, and the perceived relative cost of various Vitamin A-rich foods.

Observations

1. To determine the feasibility of conducting observations of children eating/being fed during a rapid ethnographic survey.
2. To observe how, and what, children of different ages were eating.

Market surveys

1. To determine when and where the local markets are held.
2. To assess the availability of Vitamin A-rich foods in the marketplace as well as their cost, in order to make appropriate recommendations for promoting available foods.
3. To determine seasonal availability of Vitamin A rich foods (when compared to the market surveys to be conducted in Feb/Mar 1990).

Arm circumference measurements/kwashiorkor screening

1. To determine quickly (and superficially) the level of malnutrition (marasmus and kwashiorkor) among young children in the community.
2. To train the monitrices to recognize marasmus and kwashiorkor among the children of the communities where they work.

METHODOLOGY

The methodology is described in detail to serve as a basis for understanding the recommendations for the methodology to be used in the in-depth study.

Selection of villages The villages were selected jointly by CARE/Macina personnel and K. Dettwyler. Three Bambara villages (Selle, Berta, Zambala) and three Bozo villages (Touara, Selleye, Konkankourou) were chosen. The specific villages were selected on the basis of ease of access (to reduce travel time), and to provide variation in size, environmental zone (several along the river, several farther from the river), religious beliefs (Islamic versus animist), participation in CARE's well and garden programs (some had wells, some did not, some had gardens, some did not), and project success ("good" villages, as well as villages where the monitrices felt they had not had as much success with their health programs).

Selection of interviewees The monitrices arranged for women to participate in both the focus groups and the individual interviews. In some cases, they asked for volunteers willing to spend the 1 1/2 hours required to complete the questionnaire. In other cases, they selected particular women in order to sample both

those who had participated in the project's health programs and those who had not, as well as some "average" women. Generally, I requested mothers with young children as the primary interviewees, but in Berta we also conducted one focus group interview with four women who were beyond reproductive age.

Market surveys Most of the villages do not have their own daily or weekly markets, but many people travel to the nearest weekly market on market day, even over fairly long distances. Two weekly markets were visited: (1) the weekly market in Saaro (Thursday); and (2) the much larger weekly market in Macina, the center of the Cercle (Saturday).

Interview form (SEE APPENDIX A) The primary survey tool was a structured interview (questionnaire) designed by K. Dettwyler and M. Diarra, and written in both English and Bambara (not official Bambara, but Dettwyler's phonetic transcription). The interview, as originally conceived, had four parts:

- Interview A: General Survey of Infant/Child Feeding Practices includes general information about the respondent, child mortality, and infant feeding practices.
- Interview B: Infant/Child Feeding Practices During Illness includes more specific questions about this topic, plus questions concerning traditional perceptions of malnutrition and dehydration.
- Interview C: Traditional Perceptions/Knowledge of Night Blindness addresses the question of night blindness specifically.
- Interview D: Vitamin A Rich Food/Availability and Use, was designed to elicit information about what sorts of Vitamin A rich foods were available and being consumed by the population.

We began each interview by introducing Dettwyler and Diarra, briefly explaining the purpose of the work, and emphasizing that we were interested in their thoughts and opinions, i.e. that there were no "right" or "wrong" answers to the questions. Each complete interview (A-D) took approximately one-and-a-half hours to administer.

In reality, the questionnaires served as guides to the kinds of information to be collected, rather than as strict question-answer schedules. It quickly became apparent that some questions were superfluous (everyone gave the same answer), others were confusing or misleading as worded (people consistently gave inappropriate answers), others involved concepts which are not part of the traditional world-view of the people (eg. the "how often" questions, and questions about the prevalence of various diseases in the village). Also, as the interviews progressed, information emerged which led to the addition of questions on other topics (eg. the typical daily diet, night blindness among pregnant

women, preparation techniques for carrots). Different disease terms were encountered than those used in Bamako, so the questions on traditional perceptions of malnutrition were modified to reflect these linguistic differences.

In order to standardize the results of a socio-cultural study, it is important that the questions be asked in the native language of the informants, and in exactly the same manner each time. The interviewer, Dettwyler, is relatively fluent in Bambara on the topics of the research, but does not know any Bozo. Therefore, all the interviews were conducted by Dettwyler in Bambara, using the questions on the interview form. If the respondents had difficulty understanding her Bambara, or if they didn't understand the question for other reasons, M. Diarra re-asked the question or reworded it. Diarra also helped translate long or detailed answers. In the Bozo villages, if the question seemed confusing or received an inappropriate answer, Mariam Famanta asked the question in Bozo, but the response was still given in Bambara. Occasionally, if women responded "I don't know" to a question, they were prompted. For example, if they said they didn't know any cures for night blindness, I asked "Have you ever heard of liver being used as a cure?" Without such prompting, some of the questions would have had "I don't know" as their only answer. The project monitrices were very helpful in suggesting when they thought women had not clearly understood a question, or were not telling all that they knew about a topic.

When the response revealed interesting information on a related topic, that topic was pursued. Not all questions were asked of all informants, depending on their interest and/or time constraints. In the focus groups, women tended to agree with whoever had spoken first - they seemed reluctant to offer alternate responses. Therefore, after the first two days, most of the interviews were conducted with individual women, in private.

Observations. Observations of children actually being fed solid foods turned out to be very difficult, for expected reasons. Primarily, the arrival of CARE personnel in the villages, especially non-Malians, is regarded as an event of some significance. Often women wanted to change into their best clothes and forego their normal activities in order to participate in whatever was going on. It was only with difficulty that we were able to convince women not to interrupt their work. The interviews were usually conducted in one compound, with individual women coming to be interviewed, then leaving. Occasionally they brought their youngest child with them, and the infants were nursed, but they were not fed solid foods. I had requested that we be allowed to share noontime meals with a family with small children, but in every village, special food was prepared for the "visitors" and we were served separately. At the conclusion of the study, I wrote up some simple guidelines for the monitrices to follow in collecting infant feeding observation data between the two studies

(see attached). Hopefully, this information is being collected, and can be incorporated into final recommendations for the nutrition communication materials development.

Market surveys. For the market surveys, Dettwyler, Diarra, and the monitrice simply walked up and down each row of the marketplace, observing and recording all potential sources of Vitamin A, their relative availability, and their cost. We emphasized to the commercants that we were interested in the "real" price, not the "toubab" price, and that we were not going to purchase anything, regardless of the price. However, because most prices are decided by bargaining, and because we had no way to accurately assess volume or weight of the "piles" of food for sale, the cost of various foodstuffs must be regarded as only approximate.

In order to increase the sample size for the infant feeding questions, specifically, "quick" infant feeding surveys were conducted in Selleye and Konkonkourou in conjunction with arm circumference/ kwashiorkor screenings. The procedure we followed was simply to walk around the village and stop to talk to women with young children wherever we found them. Usually they were pounding millet in small groups of 5 or 6 women. In Konkonkourou, the president of the women also helped gather some mothers together in one compound for the quick surveys and nutrition screenings. Mothers of young children were asked questions A7-15, concerning the introduction of solid foods and weaning. All children present in these groups were also measured/screened.

All of the arm circumference measurements were taken by Dettwyler using a plastic measuring tape marked in centimeters. They represent mid-upper arm circumferences taken on the left arm. Mothers were asked how old the child was; in addition, the number of deciduous and permanent teeth were recorded as a check on the child's age. The kwashiorkor screenings were conducted by examining the child and asking the mother if the child ever experienced swelling of the legs and feet, hands, face, and belly. If she responded yes, further questions were asked regarding the child's diet, and whether or not he seemed happy and played normally (apathy/sadness is a characteristic symptom of kwashiorkor). If, in Dettwyler's judgement, the child was suffering from kwashiorkor, we asked questions about previous treatment of the condition, and offered suggestions for increasing the protein content of the child's diet.

Kwashiorkor has fairly distinct symptoms, and Dettwyler is confident that her diagnoses of kwashiorkor are correct. Nephrotic syndrome has some overlapping symptoms, primarily oedema, but is very rare, and is not usually accompanied by the skin rashes and apathy of kwashiorkor. At one point, it was suggested that schistosomiasis (Fr. bilharzia) also causes oedema of the extremities, which might then be confused with kwashiorkor, but I

have not been able to find oedema listed as a symptom for schistosomiasis in any medical text, nor did I observe oedema in any of the 34 children who were known to have schistosomiasis at my primary research site in Bamako.

TIME-LINE

This section describes what activities took place each day.

Monday November 27

meeting in Segou with DRSP personnel (see attached minutes)

Tuesday, November 28

second meeting in Segou with DRSP personnel; travelled to Macina, meeting in Macina with Mark Chorna, Daffa Diallo, Mariam Famanta, to plan the week's activities in detail

Wednesday, November 29

travelled to Selle with Daffa Diallo; stopped in Saaro to meet Chef of Arrondissement, medical personnel; in Selle did two focus group interviews (3-5 women participated during the morning session, 6 women participated during the afternoon session)

Thursday, November 30

travelled to Berta with Daffa Diallo; did one focus group interview (6-8 women participated), one individual interview, did market survey of weekly market in Saaro (center of Arrondissement)

Friday, December 1

travelled to Zambala with Daffa Diallo; did three individual interviews, one focus group interview (4 older women participated); tour of village garden and well; meeting with Daffa Diallo, Mariam Famanta, and Mark Chorna to discuss progress, revise questionnaire, and plan next three days

Saturday, December 2

travelled to Touara with Mariam Famanta; did four individual interviews, did market survey of weekly market in Macina (center of Cercle)

Sunday, December 3

travelled to Selleye with Mariam Famanta; did three individual interviews, quick survey of 13 mothers of young infants on infant feeding questions only, arm circumference measurements/kwashiorkor screening on 27 children

Monday, December 4

travelled to Konkonkourou with Mariam Famanta; did two individual interviews (one with input from three other women), quick survey of 14 mothers of young infants on infant feeding questions only, arm circumference measurements/kwashiorkor screening on 44 children; tour of village gardens, well

Total focus group interviews:

4 groups:	(3-5, 6, 6-8, 4/women per group)
individual interviews:	13 women
market surveys:	2 (Saaro, Macina)
measurements:	71 children (Selleye, Konkonkourou)

Monday, December 11

debriefing at CARE/Bamako with Kathy Tilford, Lisa Nichols, and Cat McKaig.

RESULTS

In this section, the results are presented according to each topic and/or question on the interview form, followed by the results of the market surveys and anthropometric screenings. It should be kept in mind that these results are based on a very small sample size, and on data collected over a very brief period, and that the primary objective of this one-week study was to provide recommendations for the in-depth study, rather than draw substantive conclusions about beliefs and practices in the communities.

Most of the following questions were asked of each of the 13 women in the individual interviews, and of 5 additional women during the focus groups. Therefore, in most cases, the sample size is 18.

Ethnic group (A2) Of the 18 women, 9 were Bambara (from Selle, Berta, and Zambala), 3 were Maraka/Sarakole (all from Touara), and 6 were Bozo (1 from Touara, the rest from Selleye and Konkankourou). Each village includes people of several ethnic groups, but the Bambara predominated in Selle, Berta, and Zambala. Fulani women were seen in every village, selling fresh milk, but they were not interviewed. In Touara, most of the Bozo population had already left the village to set up temporary fish-camps on the river, leaving mostly Maraka families in the town.

The small sample sizes do not permit even tentative conclusions to be drawn about cultural differences in infant feeding practices or knowledge of night blindness. However, major differences in beliefs between Bambara and Bozo groups were not uncovered. More striking were the differences between urban and peri-urban beliefs and practices (from the author's research in Bamako) and beliefs of all groups in the Macina area. The interviews also revealed a lot of individual variation in beliefs and knowledge, particularly of topics covered by the monitrices in their health programs. The diet and market surveys also showed that there is great disparity in the availability and variety of foods in different villages. The only other noticeable "ethnic" difference between the three Bambara and the three Bozo villages was that, in terms of environmental sanitation, the Bozo villages were much cleaner.

Age (A3) I asked each woman how old she was, and invariably the response was "I don't know." I then probed, asking how many children the woman had, how old was her oldest child, etc., until we arrived at an estimated age, grouped according to five year intervals. The number of women in each interval were: 25-29 (3 women), 30-34 (5 women), 35-39 (4 women), 40-44 (2 women), more than 45 (4 women).

Number of children born (A4) These 18 women had given birth to a total of 119 children. The range was 3 to 12, and the average was 6.6 children per woman. Given that most of these women still have more reproductive years ahead of them, the completed fertility rate for the population, if calculated, would probably be greater than 6.6 children per woman.

Number of children who have died (A5) Of the 119 children born to these women, 48 have already died. The range of number of children who had died was 0 to 7 children, and the average was 2.7 children per woman. The number of surviving children ranged from 1 to 7, and the average was 3.9 children per woman. Again, it is likely that these women will experience the deaths of more of their children before their reproductive careers are finished.

This level of child deaths (48/119) represents a 40% childhood mortality rate. However, it also covers a time-span of 20-30 years, which means that the current childhood mortality may be quite different. According to answers received from other questions on the interview, childhood mortality is much lower now than it was in the past (attributed by the women themselves to the CARE vaccination program, and to clean water provided by the CARE wells).

Analysis of childhood deaths (A6a-d) Childhood deaths were analyzed for sex differentials, age at death, birth order, and cause of death. Of the 48 children who died, 22 were males and 26 were females. Normally, males have a higher mortality rate than females, so one could possibly interpret these figures as indicating a cultural preference for boys (either in terms of access to food and/or medical resources). However, the sample size is too small, and the difference between the two sexes likewise too small, to make any conclusions about sex bias.

All of the children who died were five years old or younger at the time of death. Eighteen died during the first month of life, 17 died between the ages of 2 months and 1 year, and 13 died between the ages of 13 months and 5 years. These figures are skewed by the data from two women, one of whom contributed 7 of the 18 who died within one month of birth; another woman contributed 6 of the 17 children dying between 2 months and one year.

Analysis of birth order and childhood mortality reveals that there is a slightly higher death rate among children of lower birth orders. The table below shows the percentage of children who died in each category:

<u>Birth Order</u>	<u>% Who Died</u>
1st-3rd	46% (25/54)
4th-6th	35% (13/37)
7th-9th	38% (8/21)
10th-12th	29% (2/7)

Detailed analysis reveals that many women lose their first, second, and sometimes third and fourth children before having a child survive past the age of five. Of the 15 mothers who had lost children, 9 had lost their first child; two mothers had lost their first four children, and one woman lost her first seven children before successfully rearing the eighth and ninth to adulthood.

Maternal experience is an obvious factor to consider in interpreting these results; as mothers gain more experience, they are better able to keep their children alive. These results agree with those from the author's analysis of growth and development in a peri-urban community near Bamako, Mali, where children of higher birth orders have better nutritional status, and grow better than children of lower birth orders. This is contrary to what one would expect if economic constraints were the primary factor influencing children's nutritional status and health, and suggests that maternal experience plays an important role in children's health.

However, the impact of the CARE project is also a factor of considerable importance in this area. Many of the deceased children of low birth orders died before the arrival of vaccinations, clean water supplies and improved birth hygiene. The better survival of higher birth order children may reflect these changes as well as increased maternal competence.

Cause of death was determined from simply asking the mother, for each child who died, "what sickness did s/he have?" If she said she didn't know, we probed by asking for symptoms which appeared prior to the child's death. Neonatal tetanus was diagnosed based on the mother's descriptions of the infant's rigid seizures, confirmed by the age at death (1 day to 22 days). Kwashiorkor was diagnosed by the author based on the mother's description of the child's appearance and apathy. This technique, known in the literature as "verbal autopsy," can never be very accurate, as many diseases have similar symptoms; also some women have had many children who died, and some of these children died many years ago, all of which can create confusion. Therefore, these data are provided with the caveat that they give only a very general idea of the primary causes of death among children in these villages. The table shows the leading causes of death elicited using the "verbal autopsy" technique.

<u>Cause</u>	<u>Number</u>
Diarrhea/stomachache	14
Malaria/fever	13
Neonatal tetanus	7
Childbirth	7
Sore throat/cough	3
Kwashiorkor	2
Measles	1
Unknown*	1
*child died while under grandmother's care	

This study was not designed to measure the impact of CARE activities on childhood mortality, but the women themselves mentioned this aspect on numerous occasions. In three villages, women reported that children hardly ever have diarrhea any more (since the installation of the wells), and the one case of neonatal tetanus reported as occurring recently (1988) was from a woman who had not participated in birth hygiene programs. In this study, only one of the 48 children who died was reported to have died from measles, though uniformly women said that many children used to die from measles before the vaccination program began.

In terms of the nutrition communication project, improved Vitamin A nutrition could potentially reduce deaths from diarrhea/stomachache, sore throat/cough, measles, and perhaps kwashiorkor (from overall nutritional improvement). The second leading cause of death, malaria/fever, is not likely to be affected by improved Vitamin A nutrition. In fact, research in Kenya and the South Pacific indicates that improving a child's overall nutritional status makes the child more vulnerable to malaria, because the parasites themselves reproduce better in a well-nourished child. Nivaquinization of the villages, a future goal of the CARE/Macina project, seems to be the best solution to this problem.

Infant feed. beliefs/practices - addition of solid foods to the diet The data reported here come both from the full interviews and from the "quick" infant feeding surveys conducted in Selleye and Konkonkourou. The table below shows the responses to the question "how many months old will he be (or was he) when he begins/began to eat solid food?" (A14).

<u>Age</u>	<u>Number of responses</u>
1-2 mos. (juice only)	2
4 mos.	3
5 mos.	6
6 mos.	6
7 mos.	13
8 mos.	0
9 mos.	1
10 mos.	1
11 mos.	1

The youngest child receiving any food other than breastmilk was a one-month old baby who was drinking orange and tomato juice. The youngest child eating moni was four months old. The oldest child who was not eating at least moni was the 11 month old, who had been eating but had stopped eating since having malaria. Most of the responses listed above represent cultural norms, either traditional beliefs or the influence of the monitrices (the women

repeat what they have been told; whether or not they follow these guidelines is another matter). According to one of the monitrices, before the project, people usually waited until the child was a year old before giving the child solid foods, and some people gave the children almost no food until they were weaned at 2 years. The recommendation to begin giving orange and tomato juice at two months, given by one of the monitrices, was recorded only in her villages. I did not observe anyone preparing juice for their infants. With regard to solid foods, most of the responses fall in the 5-7 months range. However, during the quick survey, I got the impression that many women were not, in fact, giving their infants in this age range solid foods on a regular basis - many women would say they had already started solids, but the baby hadn't had anything that day, or the day before, "because he was sick."

I am not sure exactly what messages the monitrices are currently providing regarding the best age for the addition of solid foods to the diet, whether they are all consistent, etc. Nor is it clear what the messages should be - the nutritional benefits of the early introduction of solid foods (4-5 months) are partially offset by the possibility of introducing bacteria to the infant through non-hygienic food preparation techniques, and subsequent diarrhea. This is a matter for further discussion and clarification. Also the in-depth study can hopefully provide more data on what women are actually doing with regard to starting solid foods, not just what they say they are doing.

An additional problem with regard to collecting data on this point is that we tend to assume that once an infant has "started solids" s/he will be receiving solid foods every day, and generally more than once a day. This may not be the case. The child may "start solids" at five months, but that only means that from time to time the baby is given a small amount of moni, perhaps every third or fourth day. Or the child may eat regularly for several weeks, then have nothing except breastmilk for several weeks. More detailed questions about the timing and regularity of feeding young infants are needed for the in-depth study.

Even though it does not appear on the original questionnaire, I did ask mothers what was the first food they usually give to babies. The overwhelming response to this query was "moni." Moni is a traditional breakfast porridge made from pounded millet or rice. It is cooked with a lot of water, so it has a thinner consistency than toh, and is usually consumed using a gourd dipper as a spoon/bowl. In Bambara, people referring to "drinking moni" rather than "eating moni." When infants are first beginning to drink moni, the mother or another caretaker holds the gourd dipper and helps them. Usually by 7 or 8 months, if the child can sit up by himself, he can feed himself, and takes over this responsibility.

In the study, 20 women said millet moni should be the child's first solid food, and 4 women said rice moni was the best food to begin with. Moni is usually prepared with sugar, sour milk, and lemon (citron) or n'tomi (a local fruit with a lemony flavor). Five women said they added pounded fresh peanuts to the moni, and one said she made it with bean powder (these are both suggestions of the monitrices). Other additions included pounded fish, dah, and baobab fruit powder (1 response each). Moni is considered to be "light" and easy for the baby's stomach to digest. It is thought to be good for the baby, and not to cause diarrhea, stomachache, or vomiting. Messages about fortifying the breakfast porridges with pounded peanuts or beans seem to have been well-received by the population, but it is not clear from this study how regularly porridges are prepared this way.

Other foods mentioned as appropriate for children just beginning to eat solids include sour milk, boiled meat, pounded meat, eggs, fish, pounded fish, tomatoes, potatoes, and oranges. Several women mentioned that you could begin solids with kini (rice), and toh (millet), but most women felt you should wait until the child was older before adding the adult staples to their diet.

Why will you/did you begin solid foods at this age (A15)
Responses to this questions were about equally divided between "it is time" and "it will make the baby strong." Several women also mentioned that by the age of 7 or 8 months, the baby will be asking for food, and wanting to eat when it sees other people eating. Several women said that by this time the baby's stomach will be strong enough to digest food, so it is all right to begin solids. Only one woman said the baby would become thin if you did not start solids foods by 7 months. One mentioned that when she fed the baby solids he wouldn't cry as much and she could get her work done. Two women said that you should start solids if you don't have enough breastmilk. The concept that a child has nutritional requirements which cannot be satisfied by breastmilk alone after 4-6 months, i.e. that the child needs solid foods at this time, is not strongly developed in these populations. The idea that food helps keep the baby healthy, helps the baby recover from diseases, and allows it to grow properly, are virtually non-existent. The response about food "making the baby strong" is what the monitrices tell people. Everyone agreed that you shouldn't wait until the baby is a year old before starting any solid foods - but usually only because the baby would be upset before then if you didn't let it eat.

I also asked women specifically when children could begin eating other foods, including the adult staples of kini and toh. The responses ranged from 6 months to more than two years for the addition of rice, and particularly millet toh, to the diet. Most people said the baby should not eat toh until at least 12 months, or until the baby can walk (see below). Very little rice is eaten in these villages. Although rice does not have the "bad"

reputation that toh has, most women said the child had to have been eating moni for several months before they could begin eating rice.

Food taboos for young children Several foods were mentioned over and over as being inappropriate for young infants. These are discussed below, along with the responses to questions about whether particular foods rich in Vitamin A could be eaten by young children. These questions correspond to questions D14-19, but were usually asked in connection with beginning solid foods (A14-15), or came up in women's responses to these questions.

The one food that people mentioned most consistently as being bad for young babies was toh - the thick millet porridge which serves as the carbohydrate staple for most of the villagers for most of the year. Toh is classified as a "heavy" food - the phrase in Bambara is "A ka gri," which is also used to refer to objects and people who weigh a lot, or are difficult to carry because they are heavy. People say that toh is heavy, and makes the child heavy (not fat or big, but heavy or lazy). People believe that if a mother gives toh to the baby too early, he won't walk on time. In western developmental terms, we would say that the consumption of toh delays gross motor development. This is the rationale behind the belief that children should not eat toh until they are at least a year old, or until they can walk. The heaviness of toh is also thought to make it difficult for the baby's stomach to digest, and therefore gives the baby diarrhea, which is often mentioned as a secondary reason for delaying the addition of toh to the baby's diet. The belief that toh is bad for young children was found among Bambara, Bozo, and Maraka informants.

The second food most often mentioned as being bad for young children is dege. Dege is also made from millet, and is a combination of cooked and raw millet flour, eaten as a snack. Women say that children can't eat dege because it makes their stomachs hurt, gives them diarrhea, and makes them defecate a lot (not diarrhea, just a lot in terms of quantity). Dege is considered positively bad for infants, and no one said they would give dege to babies until they are at least one year old.

Women were asked specifically about the appropriateness of giving the following foods to young children: milk, meat, including liver specifically, fish, eggs, mangoes, papayas, carrots, squash, and fresh green leaf sauce. Cow's milk, and occasionally goat's milk, is considered fine for infants. Milk is usually consumed in its soured form, and is added to the moni for breakfast. No one voiced any objections to giving meat to young infants, except that it must be pounded before being given to infants without teeth. Everyone said that liver was fine for infants and young children to eat. Fish is thought to be especially good for infants, and is sometimes introduced along with moni at 5 to 7 months of age.

With regard to eggs, one of the monitrices said that a

traditional belief is that eggs are considered bad for the development of language, and will therefore make the baby slow to talk. This belief was only expressed by one informant, who said that "old ladies don't like us to give eggs to the baby - they say we shouldn't give eggs to the babies before they can talk because then they won't be able to talk easily." However, this same informant said that she gives eggs to her children whenever she has them. In general, women feel that eggs are fine for young infants who have started to eat already. Two women said that when eggs are available, children are given first priority. Eggs are usually prepared by boiling them and eating them as a snack, rather than as part of a meal.

Mangoes are considered fine for children who have already started to eat, and women commonly mentioned that even young children eat a lot of mangoes during mango season (the hot season). Carrots pose some problems for very young infants, because most people think that carrots can only be eaten raw, and babies cannot eat raw carrots until they have teeth. Several people said a child must be at least one year old before it can eat carrots. When I suggested cooking and mashing the carrots, most people expressed surprise that carrots could be cooked (including the chauffeur and the interpreter). Only one woman (in Berta) reported that she sometimes puts carrots in the sauce for rice.

No objections to young children eating papayas, squash, tomatoes or fresh green leaf sauce were encountered.

In summary, only *toh* and *dege* were considered inappropriate for young infants, and neither of these foods have any significant amounts of Vitamin A. However, children who are only eating *moni*, and have not yet started eating *toh* and sauce, will also miss out on the Vitamin A sources found only in the sauce (onions, tomatoes, green leaves, squash, etc.). Eating sauce by itself, without *toh*, would probably seem like a strange idea. But it may be worth trying, since it is the *toh* itself, not the sauce, which is thought to be "too heavy" for the baby's stomach. In addition, the introduction of "carrot cooking" technology should remove mother's objections to giving carrots to young infants, since women say that the only reason carrots are not given to young infants is because they (the infants) have no teeth.

Infant feeding beliefs and practices - weaning (A9-10) Much confusion surrounds the term "weaning" in studies of infant feeding, either because authors do not specify the way in which the term is being used, or do not use it the same way consistently. Some people use the term to refer to the introduction of solid foods to the infant's diet, and the accompanying reduced reliance on breastmilk as a source of nutrition. With this usage, weaning can be abrupt, taking as short a time as one day (eg. an abrupt change from a diet of only breastmilk to only solid foods) or gradual, taking as long as several years (eg. if solids are

introduced at 6 months, but breastfeeding continues until 3 years).

Others, including the author in this report, use the term "weaning" to refer only to the termination of breastfeeding. For every child, there must be one last breastfeed - there is no such thing as "gradual" versus "abrupt" weaning under this usage. This use of the term weaning corresponds closely to the meaning of the French term "sevrage", and corresponds exactly to the Bambara term "shin da bo". In Bambara, the term for weaning (shin da bo) refers to the day when the mother no longer lets the child nurse, it does not refer to the gradual shift in diet from only breastmilk to only solid foods. There is no equivalent term in Bambara for this dietary transition.

Because of this confusion over the translation of the Bambara term (people assuming that "shin da bo" refers to the first meaning of weaning), I have heard people say that Malians don't give their children any solid foods until they are two years old, and then the children are "weaned abruptly." In reality, most children begin to eat solids during the second half of their first year (between 6 and 12 months) and are weaned during the second half of their second year (between 18 and 24 months) [see above, and the author's research on peri-urban infant feeding practices in Mali].

Other sources of confusion for determining "age at weaning" in Bambara society are cultural attitudes towards the importance of children's ages, and the traditional terminology for determining age. In Bamako, the author found that parents often did not know the age of their children, even those under one year of age. By two or three years after birth, the parents could be as much as 8 months off in reporting the child's age. Birthdays are not celebrated, because they are not usually known. Although urban populations, and even some rural populations, have birth certificates, most of the mothers are illiterate, and the child's age only becomes important if they are starting school.

In general, this study found that mothers in the villages near Macina were much more certain about the ages of their children. They place more importance on the child's age as an indicator of timing for infant feeding transitions (rather than developmental milestones such as number of teeth or ability to sit alone) than do the peri-urban populations. Often they reported the age precisely. For example, they would say that the child was "20 months old the day before yesterday," or they would say that the child was "6 months and 3 weeks old," or they would report "the child was born last year the last week of Ramadan." They also seemed more concerned than the peri-urban populations that children not be nursed beyond the appropriate age. I did not check reported ages against birth certificates (which don't exist for some children), but got the general impression that people kept close track of children's ages. Nor did I find any major discrepancies in reported ages compared to dental age during the anthropometric

survey. It may be that CARE's emphasis on immunization has contributed to a greater awareness of children's birth dates and ages among the mothers, or this difference (compared to urban and peri-urban populations) may reflect differences in traditional attitudes towards age.

Two potential sources of confusion were identified regarding age. Most of the time, mothers reported that children should be weaned at 23 or 24 months. They usually used the phrase "kalo mugan i saaba, walima kalo mugan i naani" (literally: "twenty-three months or twenty-four months". Sometimes, however, mothers replied "san fla ani kalo saaba, walima san fla ani kalo naani" (literally: two years and three months, or two years and four months). When mothers gave this response, I asked them to re-phrase their answer in months, and they always changed it to "23 months or 24 months". It may be that the traditional Bambara calendar (or perhaps the Islamic calendar?) has only 10 months in a year, leading to the confusion between "23 months" and "two years and three months".

The second source of confusion is that when speaking about children's ages in general, people traditionally count one year every time the month of the child's birth passes. If the child is born in February, then the second February, the child is considered "2", and the third February, the child is considered "3". Thus, if the mother says she will wean the child when he is "3 years old", she means she will wean him around the time of the third anniversary of his birth month, when he is actually 24-25 months old. Most people seemed to be aware of this discrepancy in counting age between Bambara and "European" cultures. Thus, if they answered "3 years" in response to the question, "when will you wean him?", they would then add "Bambara three years" or make some other reference to the fact that the child was really 24 months old. If they responded in years, they were always asked to rephrase their answer in months, as a check of the child's age at weaning.

These caveats aside, I will now present the data on age at weaning. If we examine the data prospectively (A8 - how old is your youngest child? and A9 - is he still nursing?, N = 38) we find that the 21 children in the study who were still nursing ranged in age from 1 to 24 months. There were no children older than 24 months of age who were still nursing at the time of the study. For the 17 children who had already been weaned, one was 18 months old, one was 20 months old, and the rest were all more than 24 months old. Thus, the youngest child already weaned was 18 months old, and the oldest child still nursing was 24 months old.

I also obtained predictive or normative data on age at weaning (A10a - when should children be weaned, or when will you wean this child?), and retrospective data on age at weaning (A10b - when did you wean this child?). These types of data are subject to biases of various sorts, but still provide useful information on cultural

norms, especially when combined with reported reasons for weaning at particular ages. For the predictive/normative data (N = 12), the range was 22 to 26 months, with a mode of 24 months (i.e. when the child's month of birth arrived for the third time). For the retrospective data (N = 32), the range of remembered ages at weaning was 14 to 28 months, with a mode again at 24 months. Only four women weaned their children at less than 18 months, and all four mentioned that they had weaned their children "early" because they were pregnant again (like the peri-urban populations, women in the villages believe that nursing a baby when you are pregnant with another will give the first baby a disease called "sere" - see more below). Likewise, only four women reported nursing children longer than 24 months, with the longest being 28 months.

In response to the question "why did you wean your baby at this age?" (not on the questionnaire, but asked following question A10b), six different responses were recorded, with some women giving several reasons. Most women seemed more concerned to explain why they don't nurse their babies longer than they do, rather than why they don't wean them earlier. The most common response recorded (N = 7) is that if you nurse a child for longer than 24 months, he "won't be nice to his parents when he grows up". Under probing, women said that children who are nursed longer than 24 months are cruel to their parents as adults, and do not help support them in their old age - a major function of children in this culture, and one of the main reasons for having children in the first place. Two women prefaced this response by saying "old woman say..." as though to imply that they themselves perhaps don't really believe this, but are just following the advice of the old women. In addition, two women claimed that if you nursed a child longer than 24 months, he would not be smart when he grew up. This belief is common in the peri-urban community of the author's previous research.

The next most common answer (N = 6) was "tradition," usually phrased as "everybody in this village weans their babies at this age." When asked why this age was the customary age, women usually provided one of the other responses as well. Two women additionally claimed that the Koran specifically says that boys should be nursed for 23 months and girls should be nursed for 24 months; after this time, the breastmilk turns to blood, and will make the children have "hard hearts" towards their parents. [I have not re-checked to see what the Koran has to say about this topic, though I do recall that in one place it says children should be nursed for two years unless both parents decide to wean the baby earlier].

Three women said only that "it was time" to wean the baby - s/he was "old enough." As reported above, four women weaned their babies "early" because they were pregnant again before the baby was 24 months old. Many other women mentioned that they would wean their babies before 24 months if they got pregnant before that

time. Only one person, a woman in Konkonkourou said that it was all right to wean your baby "early" (i.e. before 24 months) for non-pregnancy related reasons. She said that some people wean their babies "early" if the baby is eating well.

Overall, the data on age at weaning suggest that most children are weaned between the ages of 18 and 24 months, with the majority being weaned very close to 24 months. I did not see any evidence that the traditional length of breastfeeding has been reduced in the recent past (unlike the urban and peri-urban regions). In these villages, cultural beliefs seem more concerned with preventing women from nursing their babies for too long, rather than weaning them too early. For most women, only the beginning of another pregnancy justifies weaning your baby before 18 months of age. Clearly, women want to nurse their babies for the entire two years, and would prefer not to get pregnant again before that time, but this is not always possible for them. I did not ask any questions about post-partum sex taboos, or about other traditional or modern forms of contraception. However, in the peri-urban community, traditional post-partum sex taboos of one to two years duration are disappearing. This change is usually justified by the men by reference to the Koranic proscription of only 40 days. [What these data suggest is that the nutrition education program does not need to "promote breastfeeding" per se, but might want to promote family planning to allow women to control when they get pregnant again, so that they are not forced to wean their children before they want to. One of the monitrices mentioned that she tells women to start solid foods early so that "if they have to wean early because of another pregnancy, the baby will be used to eating." It seems to me that postponing the next pregnancy is a healthier solution for all concerned, and that a better message regarding starting solids is simply that the baby needs more than breastmilk after 4-6 months in order to be strong and healthy and to grow properly.]

How infants are fed (A17-20) In Mali, the semi-solid breakfast porridges (moni and seri) are eaten with a small gourd ladle; the staples (kini and toh) are eaten using the fingers of the right hand. Question A17 asked mothers whether the child feeds himself, or is fed by the mother either holding the gourd ladle for porridge, or by her using her fingers to put food in the child's hand or directly in his mouth. Responses to this question depended on the age of the child being discussed (the mother's youngest child). Eleven children were reported to be feeding themselves at the time of the study, and four were being fed by their mothers. The responses indicate that children receive some help when they are first beginning to eat, but that most are feeding themselves completely by 12 months of age.

For moni, children are said to require assistance until they are about 8 months old. Children who don't begin solids until after this age start right off feeding themselves. Some children

are also given assistance eating the staples. If the food is too hot for the child's hand, the mother may put it directly in his mouth. One woman said she put the food in the baby's hand still, even though he is 20 months old, because he tends to drop a lot of the food on the ground when he feeds himself. Another mother said she helps her six month old because otherwise he gets his clothes all dirty.

Does the child have his own bowl or does he eat with other people from a communal bowl (A18) Responses to this question also depended on the age of the child, with half the children eating from separate bowls, and half sharing a communal bowl with other family members. Children usually begin eating from a separate bowl. Most often, women said that the food cools faster if it is put in a small bowl. Several women mentioned that by giving the child his own bowl, the mother could be sure that the child got enough, and received a fair share of the meat or fish in the sauce (possibly a CARE message?). The usual age for making the transition from "own bowl" to "communal bowl" was between 2 and 4 years, though some children eat from the communal bowl from the very beginning.

Half of the young children in the study were eating from a large communal bowl. The number of people eating from each communal bowl, and the group's composition (age, sex, relatedness), depends on the size of the extended family and the ages of the children. Young children of both sexes usually eat with the mother's group. As they get older, they may join older children at a children's bowl, or sons may join their fathers and older brothers. In small families, there is only one bowl, and everyone eats together.

Who decides how much the baby eats (A19) In the author's research in a peri-urban community in Mali, the overwhelming response to this question is that the baby himself decides how much food he eats, because only the baby knows when he is full, and "fullness" is the major criteria for deciding how much food one should eat. In this study, there were several striking differences. First, in response to this question, 9 mothers said that they decide how much food the baby should eat, while only five said that the child decides himself. These responses were not connected to the age of the child. In general, women said that they knew how much food the child needed to make him full, and they decided how much he should eat. Six mothers said that if the child didn't eat much, they would encourage him to eat more; and they would give the child more food to eat if he finished all that they gave him the first time. However, three mothers said they had to limit the amount of food the child ate, because the child would not stop eating until all the food was gone, and then he would have a stomachache. Even if the child asked for more food, these women said they would not let the child eat more. One woman said the baby cannot tell when he is full, so his mother has to monitor his

food intake.

Five women said the child himself decides how much to eat. They either feed the child until he refuses to eat any more, or they don't particularly monitor how much the child eats from the communal bowl. But if the child asks for more food, there is usually something available. Several women mentioned that they always had either cooked fish or moni on hand for the young children to eat anytime they were hungry.

In both peri-urban and rural populations, the concept of a child needing a particular amount or kind of food for good health and proper growth is not well-developed. Mothers in this study uniformly stressed that children should eat "until they are full," they only disagreed on who should decide when the child was full. It is unclear how much of this difference in maternal control is attributable to the presence of the CARE monitrices in these villages.

Access to food resource (A20) "If there is meat or fish in the sauce, does the child get a lot, some, or none?" was an attempt to determine what kind of access small children had to scarce protein resources in the household. For example, in another arrondissement in southern Mali, I was told repeatedly that the best food, including meat and fish in the sauce, is reserved for the eldest members of the family (both males and females), because "they are going to die soon; young children have their whole lives to eat good food." In the peri-urban community, adult males often get the best portions of the meat or fish, but children are given at least some. In this study, of 11 responses, 10 were "the baby gets lots" and one was "the baby gets some." Women said that the youngest child in the family, assuming he was old enough to eat solid foods, was accorded first access to any meat and/or fish available in the household, because young children "need" these foods more than adults. With several interviews, I asked a series of probing questions: if there isn't enough meat/fish for everyone, who gets it? do you watch to see whether the younger children get their share from the communal bowl? do you think old people should have the best food? In response to probing, the women said that in times of food scarcity, the children eat before the adults; that they do watch to make sure the older kids don't take all the good food; and that babies need more food than old people.

These responses were heartening to hear, but should be treated cautiously. On two occasions, the response "the baby gets lots" was accompanied by nervous laughter, as though to imply "what else do you expect us to say!" Many of CARE's health programs are directed at young children, and mothers recognize that children are a top priority for CARE. Likewise, I was introduced as a "specialist in children and food." It may be that women were telling me what they thought I wanted to hear. It may also be the case that the monitrices have been teaching the women that children

should have first access to protein sources ("Group I foods"). Whether women actually follow these practices can only be confirmed by observations of mealtimes, ideally by the monitrices themselves. It is also possible, of course, that traditional infant feeding practices in these villages are simply different from those encountered elsewhere in Mali.

What do parents do when the child refuses to eat or doesn't eat very much (A21-29) In the author's peri-urban study, anorexia (poor appetite) is commonly reported among the young children. Likewise, in this study, almost all of the mothers reported that their children periodically refused to eat, or had poor appetites. Poor appetite was directly attributed to illnesses - especially malaria and other fevers, diarrhea, and stomachaches. In general, women said that if children refuse to eat, or don't eat very much, it is because they are sick. Only one woman said that her children never eat very much food before they weaned, a fairly common response in Bamako. In contrast to urban populations, women considered anorexia to be a serious problem, but more because they interpret it as a sign of sickness, rather than being concerned that the child is not eating, per se.

Questions A27-29 addressed specifically what steps parents take when children refuse to eat. The most common response to the general query (A27, what do you do if the child refuses to eat?), was that the mother prepared some other food for the child. "Whatever he likes," moni, meat, fish (in both Bambara and Bozo villages), and soured cow's milk with sugar (like yogurt), were the most common foods offered to children who refused to eat kini or toh; fried bean or millet cakes, macaroni, potatoes, coffee, peanuts, tomatoes, orange juice and extra sugar for moni or milk were also mentioned. Only a few women initially said that they tried talking to the child, playing games, offering bribes, or making threats, to get the child to eat.

Questions A28 and A29 were designed to elicit this type of information, but for some reason, women seemed very reluctant to provide it without a lot of probing and prompting on my part. For example, the following exchange is typical:

Interviewer: What do you do if the child refuses to eat?
Respondent: I COOK SOMETHING HE LIKES, OR I TRY TO FIND COW'S MILK.
Interviewer: Do you ever encourage him to eat (before cooking something else)?
Respondent: SOMETIMES.
Interviewer: How do you encourage him?
Respondent: I TALK TO HIM.
Interviewer: What do you say?
Respondent: IF YOU EAT THIS, I WILL BUY YOU SOME CANDY LATER.
Interviewer: Do you ever say anything else?
Respondent: NO

Interviewer: Do you ever threaten him?
 Respondent: NO
 Interviewer: You never say that if he doesn't eat, you will be angry?
 Respondent: (LAUGHTER) WELL, SOMETIMES I TELL HIM THAT I WILL TELL HIS FATHER IF HE DOESN'T EAT, AND HIS FATHER WILL BEAT HIM WHEN HE COMES HOME.
 Interviewer: Does that usually work?
 Respondent: YES, HE IS AFRAID OF HIS FATHER.
 Interviewer: Do you ever force the child to eat?
 Respondent: YES. SOMETIMES I HOLD HIS HANDS AND FEED HIM MONI WITH A GOURD LADLE, OR I PUT THE TOH IN HIS MOUTH.

It may be that such techniques are not commonly used, or that people are embarrassed to admit to using them. After much probing and prompting, the following general outlines emerged: the most common method of encouraging a child to eat is to bribe the child with a promise of buying something for him when he is finished. Typical bribes included buying the child candy, a toy, new clothes, or fresh fish (to eat). The most common threat was that the mother would tell the father than the child refused to eat, and the father would beat the child. Other techniques included throwing the child up in the air and playing with him for a few minutes, then trying again, holding the child in your lap and feeding him by hand, putting the child on the mother's back for a few minutes, and telling the child that she will give the food to the older children if he doesn't eat right away. Two mothers said they tell the child that if he doesn't eat, his friends will be able to beat him in fights. These two responses were the only ones that alluded to the value of food in helping make the child strong and healthy. Under prompting, people said that they never tell children that they need to eat in order to "be healthy and grow up big and strong" (a typical American line). One mother reported that she uses guilt, telling the child "I did everything for you so you could eat (grew the crops, pounded the millet, cooked the food, etc.), now you sit down and eat it!"

Other responses to anorexia included giving the child Nivaquine or oral rehydration solution (kenya-ji), or buying Vitamins for the child. A few women said it was not necessary to encourage or force the child to eat - it was all right for the child to go without food for several days if they were sick. Some people felt that threatening children with a beating to make them eat was terrible, while others saw nothing wrong with it (being beaten with a stick or whip from a locust tree is a common threat for all childhood misbehavior).

However, since anorexia is usually attributed to illness, most mothers begin with a kinder, gentler approach. Children are said to be willing to eat moni, sour milk with sugar, meat, and fish, even if they are sick and don't want to eat kini or toh, and mothers say they usually offer one of these foods as a first resort

if the child won't eat. Clearly, infant feeding games, traditional phrases, bribes, and threats, are not a typical component of the social atmosphere of mealtimes for young children in these villages. Even the generic concept of "Eat this, it's good for you" is not generally used to encourage children to eat.

Maternal perceptions of malnutrition (Questionnaire B6-9)

During the author's prior research in Bamako and in rural southern Mali, four traditional disease categories were identified which corresponded approximately to the western conditions of marasmus, kwashiorkor, and dehydration. As part of this study, we asked women if they were familiar with these diseases, and what the causes of, and cures for, these diseases were. A brief description of each of these terms, based on the earlier research, is provided below as a context for understanding the responses to these questions.

"Fasa," which literally means "skinny" in Bambara, is also used as the name of a disease which causes children to become very thin. It is often characterized as giving the baby "a large head," although, in reality, the baby's head is normal, but its body has not developed because of insufficient food. Children with "fasa" would be identified as suffering from marasmus (protein-calorie malnutrition) by a western-trained health worker. Typically, fasa is thought to be a disease that the child is born with, but whose symptoms may not show up for several months. It is not associated with food intake, nor is increased food intake thought to have any impact on the disease. There are a number of traditional herbal remedies available for treating fasa.

"Sere" is the name for the disease which a child gets by nursing from a mother who is pregnant again. The subsequent pregnancy is thought to "ruin" the breastmilk. If the baby is not weaned right away, it will get "sere" from the breastmilk. As with fasa, children with sere would be identified as having marasmus by a western-trained health worker. In traditional perceptions, it is not associated with food intake, nor can it be cured by improving the child's diet. There are herbal remedies, but many people say that the child will not get better until the next child is born. Having a child with sere is considered embarrassing, because ideally one does not get pregnant again before the first child has been weaned.

"Funu-bana" means "swelling-sickness" and is used to refer to any kind of disease which makes the body swell. When it occurs in children, they are described as having skinny arms and legs, but a huge, swollen belly. In addition, their feet and lower legs, hands and forearms, and their faces periodically swell up, and then "fall." Children with "funu-bana" are said to be very unhappy and not play like other children, but just sit in one place all the time. This is a classic description of the symptoms of kwashiorkor, which is thought to be caused by a lack of protein in

the diet, without an accompanying lack of calories. It is usually found most frequently in populations with a subsistence based on manioc, yams, or other low-protein staples. It is very rare in Bamako; I have seen only one case in 2 1/2 years of research in a peri-urban community, and that in a child who had recently come from a region of Ivory Coast where manioc was the staple. A few cases were seen in the rural villages in southern Mali, and one in a village located about 10 kilometers from Bamako. Despite its apparent rarity, many women have heard of the disease, and have known someone (friend or relative) who has had a child with this disease at some time. Funu-bana is also known as "lafali-bana" in parts of southern Mali.

People usually say they don't have any idea what causes the disease, nor are there any well-known traditional cures. Funu-bana is recognized as a disease which can kill children very quickly, in contrast to fasa and sere, which can kill children, but only after many months.

As mentioned in the methodology section, nephrotic syndrome and other conditions which cause edema could be confused with kwashiorkor unless the interviewer is familiar with the specific physical symptoms of kwashiorkor, probes for the characteristic behavioral symptoms, and asks the mother about the child's diet.

"N'gunam'ba" refers to the condition known in English as "sunken fontanelle." Rather than being recognized as a symptom of dehydration, this is traditionally thought to be a disease which gives the child diarrhea, in addition to making the top of his head sink down. There are many different theories about the cause of n'gunam'ba, including that the child can be born with it. The traditional cures are of two types. The most common cure requires that you take a needle and heat it in the fire until it is red hot, then burn the baby's forehead with it three (sometimes four) times. This procedure leaves three vertical scars in the center of the forehead. These scars can be seen throughout life, and are a common sight among children and adults in Bamako. The second type of cure involves making a mixture and using it to cover the fontanelle. The mixture usually consists of karite butter and the ashes derived from burning the skull of an animal (dog or lizard, as well as others).

Fasa Based on these descriptions, questions B6-9 were asked of informants. A number of differences were identified between the beliefs of the villagers of the Macina area and those described above. "Fasa" (B6) is more often pronounced as "pasa" in the villages of this study. Also, the term is generally used to describe children who are skinny, but not to refer to a specific, separate, disease. The monitrices and the informants were perplexed by my use of the word as though it were the name of a disease, because they were not familiar with this usage. Therefore, I changed the question to read "if a child is very very

skinny, what is the cause?" This generated a number of responses. Most people said that a number of illnesses can make a child skinny, particularly malaria, fevers, diarrhea, measles, and "fon-bin/kungolo-chi" (see below under "n'gunam'ba"). Approximately half of the informants said that children will also become skinny if they don't get enough food to eat, but this was always a secondary answer, given in response to the probe "other than illnesses, is there any reason why a baby might be very skinny?" "Insufficient food" was never given as the primary response to this question. A few people said that babies can be born very skinny, but that it doesn't mean there is anything wrong with them.

When I asked what could cure a child who was very skinny, most people said that you first look for traditional herbal medicines, then you give the child "good food." The traditional medicines are for whatever disease the child has (malaria, measles, etc.), and there are also some medicines to "help the baby be fat." Ken-kelly-ba was often mentioned as one of the traditional cures. It is a standard generic tea used for many sicknesses, analogous to aspirin. Studies by the Institute for Traditional Medicine in Bamako have shown ken-kelly-ba to be an effective anti-pyretic (fever-reducer) and a diuretic. "Good foods" include: anything he likes to eat, meat, liver, fish, moni, tomato and orange juice, chicken and guinea fowl eggs, honey, dege, and bread.

A number of the responses to this question included reference to the fact that the monitrices had told them to give good food to babies who were skinny. For example, in Zambala, the following exchange occurred:

Interviewer: If a child is very very skinny, what is the cause?"
Respondent: THERE ARE NO REALLY SKINNY CHILDREN HERE, BUT THERE USED TO BE A LOT.
Interviewer: Why are there no skinny children here now?
Respondent: WE DON'T HAVE SKINNY BABIES HERE ANYMORE. WE KNOW FOOD CAN PREVENT IT.
Interviewer: What kind of food?
Respondent: MEAT AND FISH
Interviewer: How did you know about this?
Respondent: WE HAVE BEEN TOLD HOW TO PREVENT IT.
Interviewer: Who told you?
Respondent: CARE (Laughs and indicates the monitrice).

In general, skinniness is thought to be a result of other diseases, rather than a disease in itself. It appears that the monitrices have had a lot of success in conveying the message that good food can help children recover their former weight, but somewhat less success in convincing people that insufficient food alone can make a child thin. This is understandable. Given the interaction between malnutrition and illness, and the high frequency with which children are sick, children who are malnourished but not currently or recently sick are uncommon. As

the next step, the monitrices might work on the message that giving children lots of good food before they get sick can help prevent weight loss during illnesses (and perhaps prevent some illness as well, though this doesn't work with all diseases, eg. measles or malaria).

Sere (B7) All of the women interviewed recognized "sere" as a separate disease, and all agreed that children get sere if they nurse from a mother who is pregnant again, because the new pregnancy changes the breastmilk, and makes it bad. Symptoms of sere are weight loss in the child, severe diarrhea ("the feces are like water"), fever, and refusal to eat. The first thing you do if your child gets sere is wean it, but even if you wean your child as soon as you think you are pregnant, s/he may still develop sere later, because you are pregnant for a while before you know it. Some women said that symptoms of sere in their toddler were the first indication they had that they were pregnant again.

Unlike women in the other studies, women in these villages say that the child can get better before the next baby is born. Often, weaning alone can cure sere, but most people also search for traditional medicine. When I asked if food could help, about half the women said yes, but the rest said no, because sere is a disease, therefore it requires a medicine to cure it, and also because children with sere don't like to eat.

In Selleye, but not in the other villages, all of the women interviewed said that the cure for sere was to gather "zaban" leaves (a type of tree) and 'old zaban fruit' (fruit from the previous year that had been laying on the ground under the tree for a long time) and cook them together to make a tea/wash for the baby. The baby drinks the tea, and is also washed in the liquid. Also in Selleye, one woman said you can get dirt from below the garbage dump in the village, mix it with water, and have the baby drink some, as well as wash the baby with it.

In Selle and Touara both, one woman said she would take her child to the doctor if it had sere. Sere is a big concern of the women, and is reported to be fairly common. It is an "embarrassing" disease for the mother, who is not supposed to get pregnant again while still nursing a child. Several women asked for information about medicine to prevent pregnancy, and about what kinds of foods might help cure a child of sere.

In western scientific terms, the breastmilk of a pregnant mother does not cause illness in a nursing child. However, the author's previous research on growth patterns and nutritional status of children in Mali shows that symptoms of marasmus appear during the second year of life (12-24 months) and become most severe during the third year of life (24-36 months), due to frequent illnesses and inappropriate infant feeding practices. Birth spacing in Mali is usually 2 to 3 years. Therefore, the

conditions of marasmus often become noticeable at the same time as the beginning of the mother's next pregnancy, and are therefore attributed to the pregnancy itself. I think it will be difficult to convince women that their breastmilk does not cause sere, or that insufficient food is the underlying cause of the disease. However, one could promote earlier and better supplementation as a prevention for sere, good food as a cure (to 'help' the medicine), and family planning as a way of avoiding the situation altogether. For one thing, children won't need to be weaned early if the mothers are not pregnant until after they have been weaned. Some children will still be malnourished, but if the mother isn't pregnant again, it can't be sere, and women already seem to accept good food as a cure for skinniness.

Funu-bana (B8) Funu-bana was known by most of the informants, and they described all the classic symptoms of kwashiorkor (periodically swelling of the extremities and face and abdomen, apathy), as well as reporting that toddlers and older children were the ones who usually got it. Everyone also agreed that it was a relatively rare disease. However, there was a lot of disagreement about the cause of funu-bana. Some people said that it was caused by malaria (sumaiya), while others said that it was caused by yellow fever (saye - a new word to me, translated as yellow fever by M. Diarra and the monitrices). [Those who said it was caused by yellow fever said that the sclera of the child's eyes became yellow. This sounds like hepatitis to me, but an accurate diagnosis is not possible from one symptom alone.] Even after prompting ("Can lack of food, or lack of good food cause funu-bana?"), no one thought that an insufficient diet was the cause of this disease.

Cures for funu-bana were many and varied. The first thing most people said was to go to a traditional healer, who would give you leaves to make a tea/wash for the baby. Baari-baari leaves (not identified), n'tomi (the lemony flavored pods used in moni), dah-sogo (white dah flowers), maliyirini (unidentified) and nere leaves were all mentioned as ingredients for teas/washes. In addition, mango leaves and bark were used as a treatment in Selleye and Konkankourou.

Eating fish or honey was also mentioned as a potential medicine for funu-bana. "Good food, which is always prepared cleanly," was said to be a way to prevent funu-bana (Zambala).

Three people said you should take a child with funu-bana to a modern doctor. One specifically said you should take the child to the doctor in Macina. When I asked what the doctor would do, two people said that doctors had told them to eliminate salt from the child's diet. When I asked if the doctor in Macina had said this, they said no, it was a doctor from Selingue (they had recently immigrated from Selingue).

The one child with kwashiorkor in Bamako had also been put on a salt-free diet by a modern doctor. He had been on the diet for more than a month with no improvement. I prescribed a glass of milk every morning and evening, and the child recovered completely in less than two weeks. If a child had nephrotic syndrome, a rare condition, he can be helped by a salt-free diet. A child with kwashiorkor might exhibit somewhat less swelling on a salt-free diet, but this alone will not cure the kwashiorkor. One of the monitrices said she had seen a child with "funu-bana" but she thought it had intestinal parasites.

Promotion of better infant feeding practices overall, especially making sure that young infants get enough meat, fish, milk, and eggs, is probably the best approach to preventing kwashiorkor. Training of the health workers and local medical personnel to recognize it from a combination of symptoms and questioning the mother about the child's diet. Treatment of kwashiorkor is more difficult, as severe cases must be handled carefully - a rapid introduction of too much protein in the diet can also kill the child. Adding small amounts of milk to the child's porridge every morning might be a good place to start, followed by milk in the evenings before bed, then additional meat and fish in the sauce.

N'gunam'ba (B9) This question generated a lot of controversy among the focus groups, and a lot of confusion among informants in general, for several reasons. One is that the monitrices have been trying to teach women that a sunken fontanelle is a symptom of dehydration, rather than a disease (which is true). Another is that n'gunam'ba and several related illnesses go by a variety of different names in this region (perhaps some are Bozo names?), and women disagreed about which terms were simply alternate names for the same disease, which were separate diseases, and which disease should be called by which name. Be that as it may, the following summary of the interview results is offered, according to each term provided by the informants.

When we described the appearance of a sunken fontanelle, most women in every village except Konkonkourou responded that the disease was known as "fon-bin," or "kungolo-chi." I am not sure of the literal meaning of fon-bin, but kungolo-chi means "cut head." The disease was also known by the names of fon-dimi (Selle), fon-fle (Selleye), so-ku (Berta), mimi (Zambala), and ten-chi (Konkonkourou only). None of the women had heard of the term n'gunam'ba. Most people said all these terms referred to the same disease, but others disagreed, saying that some refer to sunken fontanelles only, while others refer to a more serious cross-like depression which extends from side to side across the top of the baby's head and down between the baby's eyes (in anthropological terms - the coronal and metopic sutures). In several cases, women became flustered at my attempts to sort out these different disease terms, especially if I pointed out that they were contradicting

themselves. In those cases, we abandoned this particular question.

Fon-bin/kungolo-chi, referring to a sunken fontanelle only, is usually described as involving the sunken fontanelle itself, accompanied by fever, diarrhea, vomiting, and sometimes by a "sore in the throat." The sunken fontanelle is said to cause the child's diarrhea. If you ask what causes the fontanelle to sink, women in Berta, Zambala, and Touara said that the child has a sore in its throat which makes it unable to swallow (perhaps diphtheria??) and this sore causes the fontanelle to sink. In contrast, women in Selle, Selleye, and Konkoukou, said that fon-bin/kungolo-chi is caused when a pregnant woman walks across the area where people customarily cut fire-wood, or cuts firewood herself. Obviously some sort of analogy is being made between cutting the wood and the "cut" on the baby's head. One person said that children could be born with fon-bin/kungolo-chi, while two others said that it was caused by water from the baby's head going down into the child's abdomen.

In Berta, one woman said that the diarrhea and vomiting cause fon-bin (a sunken fontanelle), and the cure is oral rehydration solution. The same woman also said that kungolo-chi is caused by a sore in the throat, but is no longer seen in Berta because they vaccinate against it. This also suggests that the "sore" may refer to the membrane which grows across the throat in cases of diphtheria.

The most widespread cure for fon-bin/kungolo-chi is the same as that reported from Bamako - burning the baby's head three times with a red-hot needle (reported in four of six villages). Three women said you should give oral rehydration solution for the diarrhea, but you still needed to burn the baby's head to make the fontanelle "close." Traditional herbal medicines were known in Zambala and Touara. In Selleye, one woman said that the way to get rid of the sore in the baby's throat was to get shells from the river and pound them into dust. Then an old lady dips her finger in the shell powder and tries to touch the sore inside the baby's throat. This causes the baby to throw up, and then he will get better. Another cure from Selleye requires getting some dirt from underneath the kolon (mortar) used for pounding millet, and rubbing in on the baby's fontanelle. From Berta comes a description of a magical amulet called "so-ku" (like the disease), which the baby wears around its neck.

The elaborate description of severe kungolo-chi, where the cross-like cut extends down between the baby's eyes, may refer to a child whose metopic suture (between the two halves of the frontal bone) is still open at birth (seen in some populations of American Indians), and whose coronal suture is open more than normal. If such a child became very dehydrated, the sunken fontanelle would appear as a large cross, rather than a circular or oval depression.

The focus group in Selle and people in Zambala said that many children had fon-bin at the time of the study (November 1989), and that it has been a big problem for the last few years. The vaccination program against diphtheria will eliminate the cases of fon-bin/kungolo-chi caused by this virus. However, the dehydration caused by diarrhea, vomiting, fevers, and malnutrition are not so easily cured. It is encouraging that three women reported using oral rehydration solution to combat the diarrhea that accompanies or is caused by fon-bin/kungolo-chi. However, the project personnel should also encourage the use of ORS any time the child has a sunken fontanelle, because dehydration is not always accompanied by diarrhea. In Bamako, a number of people told me that they had been taught that ORS was only for diarrhea. Thus, if the child was dehydrated, with a sunken fontanelle but no diarrhea, he was not given ORS, even though the mother knew about it.

Traditional perceptions of night blindness (Questionnaire C)

In every village, everyone we asked had heard of night blindness (C1). We used the traditional Bambara word "suro-fee-yen," elicited from interviews in Bamako. The word itself means "blind at night" - suro means "at night" and fee-yen means "blind." A "fee-yen-to" is a blind person. The pronunciation found in Macina was slightly different from that in Bamako, being closer to "suran-fee-yay." Some people did not recognize the disease until we used the local pronunciation, or gave a description of the disease, after which they would say "Oh, you mean suran-fee-yay." The important point is that everyone had heard of it, and knew what it was. No other names for night blindness were elicited from any informant (C2).

How do you recognize night blindness (C3) Virtually everyone responded that the only symptom of this disease is that you can't see at night. Several mentioned specifically that your vision is fine during the day, but you can't see at night. (This distinguishes night blindness from merely having poor vision - although one would assume that uncorrected poor vision would be easier to cope with during the day than at night.) One person mentioned that you run into things and fall down, and another said you have to have someone take your hand and lead you around. Another said that if you have suranfeeyen you have trouble seeing "when the sun is going down" (i.e. at dusk), and you have to just sit in one place. One person said that the pupils of a person with night blindness become red.

Because of the disease's descriptive name, many respondents thought this question was superfluous and amusing. Only one person said she had heard of the sickness, but did not know what kind of a disease it was.

How do you know if little children have night blindness (C4)

The general consensus is that for babies and young children, you

know they have night blindness if they step on things and run into things a lot in the dark. Several women mentioned that children with night blindness just stay in one place - they don't run around and play at night like the other kids, and they have trouble finding things in the dark. For babies who were not yet walking, women said either that they didn't get night blindness, or that there was no way to tell, since someone was usually holding the baby. One woman said if it is a little baby, he will move his head back and forth trying to find the breast. One mother commented that babies just learning to walk fall down a lot anyway, so the mother might think the baby had night blindness when it really didn't.

Do people here have night blindness (C5) Respondents had a lot of trouble with some of the questions concerning prevalence of diseases/ conditions in the community. A common response to this question was "If it isn't someone in your own compound, you wouldn't know about it." This was particularly striking in Zambala, the most traditional (i.e. animistic) of the Bambara villages, where women emphasized that they knew nothing of their neighbors' problems. Again, extensive probing and prompting was necessary to get some women to say anything about this topic. For example, if they said they didn't know anyone who had night blindness, I asked "have you ever heard of pregnant women getting this disease?" and then they might say "yes, I had a friend who had it when she was pregnant" or, in several cases, admit that they had had it themselves when they were pregnant. Once we broke through their reluctance to talk, three of the four older women in the focus group interview in Zambala admitted that they had had it when they were pregnant (one with two pregnancies); they were all surprised to hear that the others had suffered from it as well. Also, people usually interpreted this question to mean "does anyone have this disease right now?" So they might say "no one has it," then report that their child had it last year.

At any rate, we often re-phrased this question as "Is night blindness a big problem in this community, and who gets it?" There were 21 "yes" responses (including two "in the past") and 10 "no" responses (including two "not any more"). Every village had at least one "yes" response, and Selle and Konkankourou had only "yes" responses.

The most common response to "who gets it?" was that pregnant women are the ones who usually suffer from night blindness (13 of the 21 "yes" responses, and at least one for each of the six villages surveyed). Eight of the women interviewed (out of 18) said they had themselves had night blindness during pregnancies in the past, though none said they had it currently. In both Selle and Zambala (Bambara villages), one person said that pregnant women used to get night blindness, but don't any more.

Of the remaining 8 "yes" responses, 4 people said that

children get night blindness and 4 that "old people" are the ones usually afflicted. One woman in Konkankourou said she had it all last year, even though she wasn't pregnant.

In general then, night blindness is perceived as primarily a problem of pregnant women, old people, and children. No cases were reported as occurring among adult men, and only one case in a non-pregnant adult woman. A number of people said that night blindness used to be a bigger problem for the population, but was not as common anymore. When asked why, one woman said that they eat a lot of fish now, so they don't have night blindness. Another said that the first time she had night blindness during a pregnancy she just waited until the child was born for it to go away, because there was no medicine. The second time she had it during a pregnancy, she ate carrots and it went away. In Berta, one woman said "many people used to have night blindness here, but now people don't have it because Daffa (the monitrice) told people to eat carrots and take the medicine given free by CARE (Vitamin A capsules)."

We also specifically asked if night blindness was a big problem for children in each community (C6), and received 11 affirmative and 12 negative answers. Only two children were reported to be suffering from night blindness at the time of the survey (a 10 year old, in Selle, child of one of the informants, and a 5 year old in Berta, the child of a friend of one of the informants). However, nine other children of respondents were reported to have had night blindness in the past, including 2 five year olds, 3 ten year olds, a fourteen year old, and 3 of unspecified age. The most cases were found in Berta (5) and Konkankourou (3). In each village except Selle, at least one person said that night blindness was not a problem there, usually phrased as "I don't know of any children who have night blindness."

This sort of approach gives only a very general idea of the prevalence of night blindness in a community, especially where people are very secretive about their personal problems, and with a disease where the symptoms are only obvious to people who observe your behavior at night. This approach will tend to underestimate the actual number of cases in the community. In addition, it must be remembered that for every case of Vitamin A deficiency manifesting itself through night blindness, there are probably a number of sub-clinical cases.

Cause of night blindness (C7) The initial response to this question was often "I don't know." We probed by asking "Have you ever heard people say what they thought the cause might be?" This often evoked one or more 'folk theories,' perhaps because it relieved people from having to say that they themselves believed this to be the cause. I got the impression that some women wanted to give the "right (i.e. toubab)" answer, but they didn't know what the "toubab" explanation was, so they just said "I don't know," rather than risk looking foolish in front of the interviewer, who

had been introduced as being particularly interested in the disease.

"Working all day in the sun" was the explanation most commonly offered as the cause of night blindness (8 responses). When I asked how children got the disease, women pointed out that children often accompany their parents to the fields and must sit in the sun for many hours at a time if there are no trees nearby for shade. This explanation was offered in every village except Konkankourou.

Other causes, each of which was mentioned once, included: fever (Konkankourou); eating "samusurugu," a type of fish (Selleye); headaches (Touara); measles, for children (Touara); and smallpox (Touara). In two villages, women said that night blindness was caused by a deficiency of good foods. In Zambala, I was told "If you are not well-nourished, you get night blindness. People eat better now. They eat liver and eggs now. So people don't get night blindness now." In Touara, one woman said "Mariam told us that a deficiency of good food can cause night blindness." Note that this response is also phrased as "Mariam told us...", not stated positively or forcefully, as though to imply that it might or might not be "correct," but was what Mariam had said.

Based on the field-testing of the questionnaire in Bamako, I asked several women if they had ever heard of the fruit of the "boom-boom" tree [unidentified] causing night blindness. No one in Macina had ever heard of a tree called the boom-boom, nor (except for the "samusurugu" fish) had they heard that eating any particular kind of food could cause night blindness.

How do you cure night blindness/what medicine is there for night blindness (C8) This question generated 29 responses, some quite elaborate, and only three were "I don't know." By far the most widely known traditional cure for night blindness involves the consumption of liver. A generic description of this cure is as follows: you take a piece of goat liver, and cook it directly over the flame of the fire; next, you rub the liquid from the liver in your eyes, and then throw the piece of liver into your house at night; you go into the house and try to find the liver in the dark; when you have found it, you come outside and eat it. Some versions of this cure omit the part about rubbing the liquid in your eyes, while others omit the part about searching for the liver in the house, but all versions include eating the liver as the final step. One response required only that you cook and eat the liver.

One informant said that "old people say" that the final step of the cure is to "put your head in the chicken house." This is an intriguing response, since several informants in Bamako said that night blindness is sometimes called "chicken-sickness" because it is well-known that chickens cannot see at night. In Indonesia, night blindness is known as "chicken eyes." In fact, chickens do not have rods in their eyes, and therefore cannot see at night.

Some people said any kind of liver (cow, sheep, or goat - but never chicken/guinea fowl) would do, but pointed out that goat liver was usually the only liver to which they had access. Others said that only goat liver worked to cure the disease. One informant said that you should use the liver "before the flies have touched it," a belief which was also encountered during the pre-test in Bamako.

This cure is reported to be very effective, although you may have to repeat it two or three days in a row. Liver is, of course, an excellent source of Vitamin A, and this traditional cure for night blindness could be the cornerstone of a prevention program. The kidneys and adrenal glands of animals also contain significant amounts of Vitamin A, and their consumption could also be promoted. The major obstacle to overcome will be the relative infrequency with which goats are killed in the village.

Another cure reported from two of the three Bozo villages involves the consumption of a particular type of fish. Four respondents said that "sa-jege" (lit. snake-fish) was the cure for night blindness, though the specific methodology differed in each case. You can: 1) throw the raw fish into the house at night and try to find it, then cook it and eat it, or 2) cook it before you throw it into the house, then find it and eat it, or 3) rub the oil from the fish on your face (not in your eyes) and then eat the fish, or 4) simply rub the oil on your face. "Nangana" is another name for the same kind of fish.

In one Bozo village, another kind of fish called a "monogo" is also used to cure night blindness. In this case, you wash the fish in water, then use the wash water to wash your face, then you cook and eat the fish itself. Like liver, fish oil is a good source of Vitamin A.

In Touara, we also heard of a cure specifically for children with night blindness. This cure requires that you catch some sort of flying creature that lives in the roof of the house (either an insect or a bird), cook it until only the ashes remain, then mix them with water in a small pot and use the water at night to wash the faces of all the children with night blindness.

The idea of consuming carrots as a cure for night blindness, introduced by the CARE monitrices, was encountered in Berta, Zambala, and Selleye. It was particularly striking in Zambala, where every interviewee mentioned carrots as one of the cures for night blindness. Two informants said they had themselves used carrots to cure their own night blindness. With two exceptions, carrots were the only vegetable foods mentioned as helping cure night blindness. In Zambala, one woman said that you could also eat cabbage and tree leaves, while in Selleye, mangoes and oranges were also mentioned. Oranges have very little Vitamin A, and cabbage almost none.

In Zambala, one of the women described the cure as follows: "There is a tree with red fruit that if you eat this food it makes you better; it is called toubab-yiri-den (white man's fruit)." After several minutes of questioning, we discovered that she was talking about carrots, which she thought grew on trees in white people's countries. The woman knew what carrots looked like, but had never seen them growing.

The women of Berta were very enthusiastic about using carrots to prevent and/or cure night blindness, but said they were often not available in the market. When I suggested that they grow their own carrots, they said they needed seeds, and if provided seeds, they would begin growing carrots in their gardens!

The final cure mentioned for night blindness was Vitamin A capsules. Three women in Selle (during separate interviews), and one woman in Zambala said that you could purchase "toubabu-frwa" (white man's medicine) for night blindness in the market in Saaro. Both described the medicine as being a small, soft pill. When I showed them the Vitamin A capsule pictured in the HKI brochure, they all said "Yes, that it!" One of the woman said she had herself purchased a capsule for 150 CFA at the Saaro market, while another had purchased a capsule at the Folomana market (location unknown). As mentioned above, one woman in Berta said that CARE had distributed Vitamin A capsules free of charge.

Can night blindness make you completely blind? (C10) In response to this question, nine women said yes, four said no, and three said they didn't know. Most of the yes responses were qualified by saying that you had to have the disease for a long time before it would make you blind during the day as well as at night.

Measles and blindness Because of the concern that measles can make children blind via Vitamin A deficiency, we asked women whether they thought measles could make children blind (C11), and whether or not measles was a big problem for their village. In every case (N=14), women said "yes, measles can make children blind." One woman said it can also make the child's eyes cloud over or turn white. However, three of the responses were qualified by statements to the effect that blindness from measles is not common, and nine of the "yes" responses were followed by enthusiastic proclamations that the villages don't have measles any more because of the vaccination program.

Xerophthalmia Questions C12-15 were designed to be used in conjunction with the four pictures in the HKI brochure which show various stages of Vitamin A deficiency, from Bitot's spots to complete keratomalacia. I handed the card to the informant, and asked her if she had ever seen people with eyes like those in the photographs. People had a lot of difficulty figuring out what the

pictures were (they are close-up shots of eyes only), and what specifically they were supposed to focus on. In the last picture, in particular, the person has blood-shot eyes, and people always noticed the red sclera rather than the opaque and deformed pupil or ruptured cornea.

The first two photographs (C12-13) show the development of Bitot's spots on the sclera of the eye. Most of the informants said they had never seen white plaques like these. Of the five "yes" responses, two were associated with measles (in Selle and Touara); the other three just said that they had seen people in the village with eyes like those in the photos.

The third photograph shows an individual whose eye has "changed shape" (C14). None of the informants reported ever seeing this condition. The fourth photograph shows an individual whose pupil is completely obscured, with a milky/cloudy white appearance (C15). Again, most people said they had never seen people with eyes like that. One woman said she had once seen a woman in the market at Macina with eyes like that, and another woman (in Touara) said one of the old ladies in the village had one eye that looked that way, and she was completely blind in that eye. Keratomalacia can look like a cataract, and given that Vitamin A deficiency should affect both eyes equally, this latter description is probably that of a cataract.

Overall, the use of the photographs was not very successful, and didn't contribute substantially to the information collected.

As a final note - while crossing the river back to Macina one afternoon, we were accompanied by three women from another CARE village, near Sai, who were going into Macina for a meeting about the garden project. When we explained what we were doing, they said that night blindness was really a big problem in their village, and in other villages near them. They said that many children and adults suffered from it. It may be that some villages in the region have more potential for Vitamin A deficiency than others, depending on local variations in diet, especially access to fresh fish from the river, and to markets which sell vegetables and fruit imported from other parts of the country. In addition, villages which are located too far from the river to have abundant fish, are also probably too far for people to go regularly to the market in Macina, which has a wider variety of vegetables and fruit than the local markets.

SUMMARY

Night blindness, one of the earliest and most characteristic symptoms of Vitamin A deficiency, is well-known throughout the region, though it is not considered to be a major problem in any of the six villages visited. The perception of the population is that pregnant women are most at risk for having the disease, followed by young children and old people. The most common belief about the cause is that it comes from working all day in the bright sun. Most women, although they know traditional cures for night blindness, do not bother to do anything about it during pregnancy, because they know that when the baby is born, the disease will go away by itself. The most common cures for night blindness are the consumption of goat liver, snake-fish, and carrots. The fact that everyone knows the disease, and that pregnant women often have it, suggests that while clinical symptoms may be relatively rare, there are probably a substantial number of people with sub-clinical Vitamin A deficiency. A major focus of the March study should be an examination of food consumption during pregnancy, to determine which factors are contributing to Vitamin A deficiency in pregnant women: 1) if pregnant women become deficient because they are not allowed to eat Vitamin A rich foods, or 2) if they are limiting their intake of all foods in order to have a smaller baby (and easier childbirth), or 3) if their diet is the same, but the extra demands of the fetus make their pre-existing Vitamin A deficiency worse, to the point where symptoms become apparent.

Daily diet The original questionnaire did not include any questions about typical food intake, but they were added as the interviews progressed. We asked "what do you usually eat for breakfast/lunch/ afternoon meal for kids/dinner?" For the staples, we asked what kinds of sauces were usually prepared, and what the ingredients were for each sauce. We also tried to assess "how often" different foods were eaten, but this question seemed incomprehensible to most informants, and it was only with difficulty that we were able to extract approximate food frequency data. The following exchange is typical:

Interviewer: How often do you eat meat?
Respondent: WHENEVER SOMEONE KILLS A GOAT.
Interviewer: How often does someone kill a goat?
Respondent: WHENEVER THEY NEED MONEY. [Note: people kill a goat and sell the meat to their neighbors when they need cash - for taxes, medicine, or other things that must be purchased.]
Interviewer: Well, does this happen every week?
Respondent: OH NO.
Interviewer: Once a year?
Respondent: MORE THAN THAT.
Interviewer: So, how often does someone kill a goat?
Respondent: MAYBE THREE OR FOUR TIMES A YEAR.
Interviewer: OK, thank you! How often do you eat eggs?

Respondent: WHENEVER WE CAN GET THEM.
 (repeat same sequence of questions as for meat)
Interviewer: How often do you eat carrots?
Respondent: WHENEVER WE CAN AFFORD THEM.
 (repeat same sequence of questions as for meat and
 eggs)

.....and on and on.....

Clearly, the villagers are not used to thinking in terms of "how often do you do something?" Similarly, they had trouble with the concept of "how common is this disease?" Consumption is opportunistic - they are not choosing how often to consume a particular food based solely on their like or dislike of the food. They eat foods they can get. When meat is available, they try to buy some; when it is mango season, everyone eats a lot of mangoes; if they have money for carrots on market day, they buy some.

Admittedly, one problem with the interview form, as designed, is that the food availability/consumption data come last (Interview D), when both interviewer and interviewee were tired. For the three-week study, it would be better if different people were interviewed for the availability/ consumption survey, or if it was put first on alternate interviews. Also, the men of the village might have a better idea about how often goats are killed, since they are the ones responsible for maintaining the herds and they make the decisions about when to slaughter an animal.

The following summary is based on only 10 availability/consumption interviews, and not all of them were complete. The Feb/Mar study should provide the level of detail needed to make a more accurate assessment of the availability of Vitamin A rich foods.

Generally speaking, in all six villages, the breakfast food of choice is moni made from millet flour. In addition to millet and water, moni often contains one or more of the following: sugar, salt, lemon, orange, n'tomi, white dah, sour milk, and pounded peanuts (put only in children's moni). One woman, tiring of my question "Do you put anything else in the moni?" also mentioned a spoon! In Touara, two informants said they drink coffee with milk and sugar, in the morning, in addition to moni.

Noon time and evening meals are based on one of the two staples - either millet or rice. Millet is pounded into flour and made into toh (a thick, Cream of Wheat-like substance) or made into cous-cous (small aggregates of millet flour, steamed over boiling water, known in Bambara as "bashi"). Rice is boiled. The amount of rainfall and/or the possibility of irrigation determines whether rice can be grown. If rice must be purchased, its cost and availability may limit consumption, and of course, tradition plays a role in determining whether rice or millet is eaten more often.

In the three Bambara villages, millet is usually the base for lunch and evening meals, as well as breakfast. Rice is eaten occasionally, and must be purchased in the market. In the Bozo villages, rice is eaten more often than in the Bambara villages. At noon, rice is alternated with millet *toh* or millet *bashi*. Millet *toh* is usually eaten at night. In Selleye, people said they grow rice, but in Konkonkourou they said they have not been able to grow rice since the drought, but they still buy it in the market.

Different kinds of sauces are prepared for serving with millet and rice. Sauces that go well with *toh* are not used for rice, and vice versa. The most common sauces for *toh* are those based on baobab leaves or okra (fresh in the rainy season, dried the rest of the year). All sauces include salt [Villagers prefer "white" salt purchased in Macina over "black" salt which comes from Taodenni - they say the black salt is dirty. This is important because the salt from Taodenni contains iodine while the white salt from Macina does not. If CARE officials want to decrease the incidence of iodine deficiency in the villages, a mild but widespread problem, they will need to overcome villagers' aversion to Taodenni salt, or find some other source of iodine.] The most common sauces for rice are fish and tomato, peanut butter, and *soumbala*. Sauces for *bashi* include fresh peanut sauce and bean leaf or *nporon* leaf sauce.

Informants were asked about their consumption of all potentially available foods known to be rich in Vitamin A, including meat, fish, milk, eggs, red palm oil, mangoes, squash, carrots, tomatoes, onions, okra, baobab leaves, and other green leaves. [Although sweet potatoes are usually considered an excellent source of Vitamin A, only the deep-orange sweet potatoes have significant amounts of the Vitamin. The yellower variety of sweet potatoes are not noted for their Vitamin A activity, and the kind of "sweet potato" grown in Macina and other parts of Mali has white flesh, and contains little or no Vitamin A. Sweet potatoes are considered good to eat, however, and people grow them in their gardens. Perhaps a Vitamin-A rich variety could be introduced.] Market survey information is provided at the end of this section.

Meat is eaten rarely in these villages, because goats, the primary form of livestock, are only killed when the owner needs ready cash. Estimates of how often a goat was killed in the village ranged from several times a year to once a month. During the rainy season, the goat herds are sent to the river, so meat is eaten less often. During the cool and dry seasons, the goats are kept in the village, and are available both for milking and for slaughtering. Therefore, meat and milk consumption from goats is higher in the cool and dry seasons than in the rainy season. When meat is available, it is cut into chunks which are put in the sauce. All parts of the animal are used.

Because of the proximity of the Niger River, fish plays a much greater role in the diet than meat, especially for the Bozo. In the Bambara villages, fish is eaten almost every day, usually in its dried or smoked forms. Fresh fish is rarely available, and not in large quantities. Fish is used to flavor the sauce, and often is not identifiable (ie. you can't see pieces of fish, but you can taste the flavor). If people can afford it, they will fry small fish especially for the children, as a snack between meals, or as "dessert."

In the Bozo villages, fresh fish is available in much greater quantities and is often eaten at both noon and evening meals. In one Bozo village, whole fish were served as part of the sauce for rice, but this may have been especially for us. The Bozo smoke and dry fish to preserve it. They also sell a lot of fish in the market to earn money for other foods, or non-food expenses. [They may also trade fish for milk from the Fulani, but I didn't ask about this specifically.]

The Fulani cattle herders of the region serve as the main source of milk for the villagers. During the rainy season, the cows produce a lot of milk, and it is available every day. Villagers consider milk to be inexpensive during the rainy season, and buy some almost every day from the Fulani women, who travel door-to-door through the village offering milk for sale. During the dry season the Fulani herds may move away, and/or the cows produce less milk, so the Fulani may not have any extra to sell, or it may be too expensive. In some villages, women said no cows' milk was available during the dry season, while others said it was simply too expensive, so they bought it less frequently. Milk is usually consumed in its sour form (nono-kunu), either by itself or added to moni, and is usually sweetened with sugar. Unlike Niger, milk in Mali is not usually skimmed.

When the goat herds are in the villages, the goats provide some milk, but in Selleye women said they usually didn't milk their goats, leaving all of the milk to the baby goats. In the other villages, they said they did get a little milk from their goat herds.

Chickens and guinea fowl were observed in all the villages. Eggs are usually allowed to hatch, rather than being eaten as eggs. When eggs are consumed, they are boiled and eaten as a snack. Chickens are occasionally killed and used in the sauce, but mainly for feasts or celebrations, or for special visitors (like the CARE/anthropologist team). Chickens are also given away as gifts to visitors, and to new mothers.

Red palm oil is an excellent source of Vitamin A. However, it is rarely available in this region. In Bamako, red palm oil is considered more flavorful and has a higher "status" than peanut

oil. However, it is also more expensive than peanut oil, and is used more as a flavoring than as the principle source of oil in the sauce. In the villages, the main source of oil is karite (shea nut butter), which is made by villagers farther south, and sold in the markets of this region. Bottled peanut oil is also available in the market, but is more expensive than karite, and is seldom used. Thus, while promoting the consumption of red palm oil is a feasible option for a nutrition communication program in southern Mali, it is not appropriate for this region.

Mangoes are an excellent seasonal source of Vitamin A, and are consumed in all of the villages of the study. Mango season is the hot season (March-May/June), and mangoes are plentiful and very inexpensive during this season. Some villages have their own mango trees, while others buy mangoes in the market. Everyone eats a lot of mangoes during mango season, as many as 3 or 4 a day. Children are especially fond of mangoes, which are one of the few sources of sugar in the diet. When I asked women if little children were allowed to eat mangoes, many responded that they purchased mangoes especially for the children, because children love them so much. Konkankourou had the most mangoes trees of any of the villages. I don't think that the NCP/CVA needs to promote the consumption of mangoes, as everyone seems to take advantage of this source already. Although people do say that eating too many mangoes can cause diarrhea, no one said that children should not be allowed to eat them for this reason.

Squash is grown during the rainy season in Zambala and Selleye. The villagers of Touara said they tried to grow squash in their gardens, but it wouldn't grow there. The only squash observed during the study were two squash which were for sale in the Macina market. The promotion of squash as a garden crop, as well as a rainy season crop, seems appropriate. A lot of squash is eaten in Bamako, where one can buy pieces of different sizes, as well as whole squash, in the market. It is very inexpensive in Bamako during the season (end of the rains, beginning of the cool season). Squash is cut into small pieces and cooked as part of the sauce. Since there are many varieties of squash, it should be possible to find some which will grow in this region. Or, if the demand is created, farmers farther south could grow it and sell it in the markets of this region (the way watermelons are grown near Segou and exported to all parts of the country).

Carrots are the quintessential "Vitamin A" food, and have been promoted as preventing/curing night blindness already by some of the monitrices. Carrots are grown in Touara and Selleye in the gardens, and are purchased in the market by residents of all the villages. Carrots are considered a relatively expensive "treat," but have some prestige value as they are new, and associated with white people. When I asked whether carrots were eaten fresh or cooked in the sauce, informants (with one exception) looked at me incredulously and said "You can't cook carrots!" Apparently,

carrots are normally eaten raw, as a snack. Only one woman said that she occasionally put carrots in the sauce. Everyone else said they didn't know that carrots could be cooked. The main objection to letting little children eat carrots is that they don't have enough teeth. As mentioned earlier in the report, if carrot-cooking and smashing were introduced as a special food for babies, they would have a new source of Vitamin A.

One other aspect of carrot consumption which is noteworthy, is that in those village where carrots are only available in the market, a number of women said that when they buy carrots ("when we can afford them") they usually buy two or three, and they eat them themselves while they are at the market. They are eaten as a snack, and as a treat. They are seldom brought home for sharing with other family members. Women said that they couldn't afford to buy enough for everyone in the family, so they just bought a few for themselves. If they had a child with them in the market, that child might get one, but not the children at home. It would be interesting to find out if men ever get carrots to eat. Unless carrots can be grown in local gardens, or the price comes down, it may be difficult to convince women to give up one of their few indulgences.

No carrots were seen in the markets in Saaro or Macina, although carrots were plentiful and cheap in Bamako and Segou in Nov/Dec 1989. People said carrots could be found in the market in January and February. Carrots seem to be gaining in popularity, and in Selleye, people said they were planning to plant carrots this year. If demand were created, people could grow their own carrots and sell the surplus in the market. Also, if commercants knew that people would buy them, carrots could be imported from farther south, and would thus be available for more of the year.

Tomatoes and onions are common sauce ingredients in Mali. In Bamako, fresh tomatoes and onions are available year round and are inexpensive. Tomato paste is also widely used as a flavoring. In the villages of Macina, most people must make do with dried onions and tomato paste for most of the year. Fresh onions were rare in the market, and were very small. Dried onions, on the other hand, were abundant and inexpensive. Tomato paste was available in both the Saaro and Macina markets. In the big Macina market (Saturday) fresh tomatoes were available, but they were not always available in the daily Macina market during the week of the study.

Tomatoes and onions are reportedly grown in gardens in Touara and Selleye, and I saw onions growing in a large private garden in Konkonkourou. Tomatoes were mentioned more often as sauce ingredients in the Bozo villages than in the Bambara villages. In the Bozo villages, fish sauce, peanut butter sauce, and onion sauce all include tomatoes. In the Bambara villages, the most frequent sauces are made with okra, or with baobab leaf powder. Only the peanut butter sauce served with rice, which is eaten infrequently,

had tomatoes in it, and they were dried tomatoes. Both tomatoes and onions are normally dried in the sun.

Okra is one of the staple sauce ingredients in all of the villages, but particularly the Bambara villages. Okra is grown in fields during the rainy season (like millet), and is eaten fresh during this season. Most of the crop is dried in order to preserve it, which destroys some of the Vitamin A. If okra and baobab leaves were dried in the shade, rather than in direct sunlight, more of the Vitamin A content would be preserved. For most of the year, okra sauce is made from reconstituted dried and pounded okra (okra powder). Okra sauce may include dried fish, pounded peanuts, and salt. In the markets in Saaro and Macina during Nov/Dec 1989, dried okra was abundant and inexpensive, but fresh okra was not seen, even though fresh okra was available in Bamako and Segou.

Baobab leaves are the other staple sauce ingredient in the Bambara villages. Baobabs grow wild in the region, but are not found as frequently in the areas near the Bozo villages. It isn't clear whether villagers themselves collect the baobab leaves on a family-by-family basis, or if they buy them in the market from other people. In Selle, we were served a 'typical' meal - millet toh with dried baobab leaf powder sauce. The sauce also included salt and hot peppers and water. When the field assistant commented on the simplicity of the sauce, he was told "this is what we eat every day, all year round."

Fresh baobab leaves are used during the rainy season, but for most of the year, only dried baobab leaves are available, and only dried leaves were for sale in the Saaro and Macina markets. In the Bozo villages, during the rainy season, fresh baobab leaf sauce may be made for toh. However, for most of the year, only dried baobab leaves are available, and they are used as a flavoring in other sauces, rather than as the basis for a sauce themselves. Bozo villagers do not care for dried baobab leaf powder sauce. Like tomatoes, onions and okra, baobab leaves are dried in the sun.

Other than bean leaves and nporon leaves grown in the gardens in Konkankourou, no other fresh leaves were mentioned as being used in sauces. We may need to ask specifically "do you ever use _____ leaves in sauce?" in order to elicit foods that are eaten only infrequently. Certainly in Bamako, many different kinds of fresh green leaves were abundant in the market in November, including sweet potato leaves, white potato leaves, okra leaves, dah leaves, squash leaves, and nporon, sofon, and misenni kunbere leaves (local plants grown for leaves only). Or, it is possible that villagers in this region are not aware that sweet potato leaves, okra leaves, dah leaves, and other fresh leaves can be eaten.

Guavas were abundant in the markets in Macina and Saaro in Nov/Dec, but have a short season of only one to two months.

However, they are available in the cool season, when few other sources are available in the market. Guavas are not as popular as mangoes, and could be promoted as a source of Vitamin A.

Last, but not least, hot red peppers are a good source of Vitamin A and a common sauce constituent, especially in the Bozo villages. Some villages grow red peppers in irrigated gardens near wells, and peppers were plentiful in the market both fresh and dried. It would be difficult to increase young children's consumption of hot red peppers in sauces. However, if the peppers were dried in the shade, the same amount of pepper (and therefore spiciness) in the sauce would provide more Vitamin A.

In general, compared to the markets in Bamako and Segou, very few sources of Vitamin A are available to the residents of this area. Dried onions, dried tomatoes and tomato paste, guavas, dried okra, dried baobab leaves, fish, and milk were the only abundant sources of Vitamin A in the markets in Nov/Dec. Carrots are reported to be more abundant in January and February, and mangoes will be available in the hot season. A wider variety of fresh vegetables and leaves are available in the rainy season, and milk is also more plentiful then. More meat is available in the cool and dry seasons, because the goats are in the villages.

With more data about the seasonal availability of foods, and the market surveys to be conducted in Feb/Mar, it should be possible to construct a calendar of foods rich in Vitamin A for each month or season, and the monitrices could promote each food during its period of peak availability. Perhaps February could be "carrot month" and March could be "mango" month, for example. Lessons about the value of these foods will be more successful if the villagers can try them right away. It makes little sense to promote the consumption of carrots when carrots are not available, as was the case in Nov/Dec.

Market surveys - Nov/Dec 1989.

<u>FOOD</u>	<u>SAARO</u>		<u>MACINA</u>	
	<u>QUANTITY</u>	<u>PRICE/MEASURE</u>	<u>QUANTITY</u>	<u>PRICE/MEASURE</u>
meat	10 goats	100 CFA/1 C	DK	
fresh fish	little		tons	DK
dried fish	plenty	100 CFA/pile	tons	DK
		200 CFA/5 8" fish		
smoked fish	plenty	100 CFA/1 qt.	tons	DK
fish oil	NONE		NONE	
liver	DK		DK	
chicken eggs	NONE		NONE	(hidden?)
guinea fowl eggs	NONE		NONE	
fresh milk	NONE		NONE	
sour milk	little	3 gourdsful/25 CFA	some	DK
peanuts	tons	30 CFA/2 C	tons	25 CFA/2 C
groundnuts	some	25F/1 C grilled	NONE	
Cube Maggi	plenty	20 CFA/1	plenty	20 CFA/1
soumbala	plenty	10 CFA/8 pieces	some	DK
beans	some	35 CFA/2 C	NONE	
<u>fruits</u>				
mangoes	NONE		NONE	
guavas	tons	5 CFA/each	tons	5 CFA/each
oranges	some	50 CFA/4	some	10 CFA/each
mandarins	some	50 CFA/5	NONE	
citrons	some	5 CFA/3	some	5 CFA/4
lemons	a few	10 CFA/each	NONE	
papaya	NONE		NONE	
tamarind/dates?	plenty	5 CFA/2	NONE	
banana	NONE		a few	DK
plaintain	NONE		NONE	
watermelons	a few	25 CFA/grapefruit size	NONE	
water lily fruit	NONE		NONE	
zaban	NONE		NONE	
sebe	NONE		NONE	
nere	NONE		NONE	
ntomi	some	25 CFA/2 cups	some	
sun-sun	some	10 CFA/1 C	NONE	
(little yellow fruit, wild)				
dah-bilen	plenty	25 CFA/1 1/2 C	plenty	25 CFA/2 C
dah-bulu	some		some	
dah-sogo	some		some	
zimini	plenty	5 CFA/4		

<u>FOOD</u>	<u>QUANTITY</u>	<u>PRICE/MEASURE</u>	<u>QUANTITY</u>	<u>PRICE/MEASURE</u>
<u>vegetables</u>				
carrots	NONE		NONE	
squash	NONE		2 big	350-400 CFA/each
fresh tomatoes	a few	50 CFA/5-6 med. 100 CFA/7 little	some	100 CFA/4 big 50 CFA/3 little 25 CFA/5 tiny
tomato paste	plenty	100 CFA/70 gm can	plenty	
fresh onions	some	50 CFA/1 C	lots	
dried onions	plenty	25 CFA/4" pile	tons	
fresh okra	NONE		NONE	
dried okra	tons	25 CFA/2 C	tons	
corn	NONE		NONE	
sweet potatoes (white flesh)	some	50 CFA/7 med. 100 CFA/5 big	some	100 CFA/9 med.
green tomatoes	NONE		tons	25-30 CFA/each
little red peppers	plenty	25 CFA/1 C	plenty	25 CFA/1 C
big red peppers	plenty	25 CFA/1 C	some	
<u>leaves</u>				
squash leaves	NONE		NONE	
okra leaves	NONE		NONE	
sweet potato	NONE		NONE	
ngoyo leaves	NONE		NONE	
fresh baobab	NONE (til January)		NONE	
dried baobab	tons	25 CFA/2 C	tons	15 CFA/2 C
dried onion	some	25 CFA/3 C	NONE	
peanut leaves	NONE		NONE	
manioc leaves	NONE		NONE	
nporon leaves	NONE		NONE	
sofon leaves	NONE		NONE	
mishi-ni kunbere	NONE		NONE	
<u>oil</u>				
peanut oil	only a few	550 CFA/1 liter	plenty	500 CFA/1 liter
red palm oil	NONE		NONE	
karite	plenty	25 CFA/2" ball		

The market surveys, as conducted, are not thorough enough to make any firm conclusions. In general, there were more foods available in Macina, and prices were slightly lower in Macina. However, in both markets, very few good sources of Vitamin A were available at all. Clearly, more detailed and accurate market surveys need to be conducted in Feb/Mar, using some sort of volume/weight device to determine quantities.

Measurements and kwashiorkor screenings In Selleye and Konkankourou, children's arm circumferences were measured and they were screened for kwashiorkor. This brief survey was intended to provide only a general indication of the level of malnutrition in the community. Generally speaking, between the ages of 6 months and 5 years, healthy children will have arm circumferences between 15 and 16 cm. Anyone with an arm circumference below 14 cm is probably undernourished. Circumferences less than 12 cm indicate severe malnutrition.

In Selleye, we measured 27 children. Nine children (33%) had arm circumferences less than 14 cm. All of these children were less than 2 1/2 years old. None of the children under 3 had arm circumferences in the normal range (above 15 cm). Three of the children had arm circumferences less than 12 cm. Their ages were 4 months, 7 months, and 11 months. No children with kwashiorkor were identified in Selleye.

In Konkankourou, we measured 44 children. Eleven children (25%) had arm circumferences less than 14 cm. None of the children under 3 years of age had arm circumferences in the normal range (above 15 cm). Only one child, 22 months of age, had an arm circumference less than 12 cm. However, 5 children were identified as having kwashiorkor. One child, at 22 months old, was still breastfeeding. Two of the children were 26 months old, and both had been weaned at 24 months. Two older children, one approximately 6 years old, the other at least 12, also had kwashiorkor. Both of the older children had been taken to see a doctor in Selingue, who prescribed salt-free diets. The 12 year old had an especially severe case.

I am not going to draw any conclusions from these data, except to say that malnutrition among young children clearly is a problem in these communities, even though there were only a few children who were severely malnourished. Although kwashiorkor is not common, it is still important for women to have information about how to treat this condition when they do see it. This is especially critical if the nutrition communication project hopes to have lasting, widespread effects. People move in and out of these communities, and will carry the information they have learned to non-project villages. Likewise, when women move into project communities with children suffering from kwashiorkor or night blindness, the project villagers will know what to do to treat these conditions.

RECOMMENDATIONS FOR THE THREE-WEEK STUDY IN MARCH

Logistics In terms of logistics, I would make the following recommendations. Assuming 16 days "in the field" in the villages of Macina, spending two days interviewing in each village, a maximum of 8 villages could be covered. Alternatively, we could do more in-depth studies in 4 villages, spending four days in each village. CARE Regional personnel have suggested the more in-depth approach, concentrating on fewer villages. Depending on the participation of CARE/Macina and MOH personnel, the research team could split up and interview a number of women in separate compounds at the same time. Because of the difficulty of transportation, it is not feasible to send the teams to different villages.

I found that it really helped to have the monitrice present, not just to be a "buffer" between the toubab-interviewer and the villager, but because of the interaction that often developed among all of those present. The monitrices were especially adept at realizing when a woman didn't really understand the question, or really knew the answer but wouldn't talk out of shyness, or because she was unsure of herself. Even with Malian interviewers, women may still feel that they are expected to know the "right answer" and be reluctant to give their opinions. Because the monitrices know most of the women personally, and are highly respected by the villagers, women will probably be more willing to talk when the monitrices are there to help with the interviewing.

I suggest that several of the villages to be included in the in-depth study be either non-project villages (this will require the approval of Dr. Diakite, DRSP-Segou) or villages where only well or garden projects are present, but not health projects. This will give a more balanced view of traditional beliefs, and help separate which beliefs and practices have been adopted as a result of the project and which were already in place. These might be villages from the Monimpe area (west of the town of Macina), or villages near Saye, in the region where night blindness is reported to be more of a problem. Both Bozo and Bambara villages should be included. Although there are some differences in diet and food availability between villages, these did not always fall out along Bozo/Bambara lines, nor were conditions and beliefs in the villages so different that they would necessitate two separate nutrition education programs.

One logistic problem noted in the AED/Niger study (1989), which also applies here, is that conditions are very arduous and tiring for the interviewer! In Brandstetter and Fishman, they note that the research teams could not sustain the energy or the motivation to observe early morning feeding sessions, or evening meals. This is problem for any rapid ethnographic survey when one is not living for an extended period in one village. Breakfast is often eaten before the sun rises, or at least before 7 am. Dinner

is usually eaten after the sun sets, and many times young children are already asleep by the time this meal is served anyway. This makes it almost impossible for the "drop-in" anthropologist to make observations of these meals.

Coupled with the general paucity of food in the region, and the dehydrating effects of working in the heat, and for general mental health, it will be necessary for the research teams to return to Macina late each afternoon. The CARE guest house sleeps six (two double beds, two single beds). The kitchen has a stove and refrigerator, pots and pans and dishes. As noted above, many foods available in Bamako and Segou are not available in Macina. The research team should therefore bring along supplies of food from Bamako or Segou.

It would be extremely useful to schedule one or two "rest days" during the study as well. Perhaps the morning of the rest day could be spend meeting with all involved personnel to discuss progress and problems, and make alterations in the research strategy. The afternoon could then be used to rest. I know that during the six day study in Nov/Dec, I was exhausted by the afternoon of the fifth day, and returned to Macina early in the afternoon to sleep. Likewise, questions asked during the last interview of each day were not pursued with the rigor of the earlier interviews. I also felt that I didn't have enough time to just sit and talk to the monitrices about what sorts of messages they were currently giving about nutrition matters, what kinds of practices were prevalent in the villages when they began the project, and which sort of changes/messages seemed easy to get across, and which were more difficult. The monitrices know these villages intimately, and have a lot of knowledge and experience to communicate regarding the design and implementation of the educational program, especially the logistical feasibility of various media.

One full day at the conclusion of the study should be spent discussing the results with as many of the CARE/Macina personnel as can be gathered together. I know that they have monthly meetings when all the monitrices come to Macina - perhaps a meeting could be arranged for the end of the study period. Local and regional medical personnel should also be invited to attend this final meeting.

I strongly recommend that Daffa Diallo and Mariam Famanta participate in the in-depth study, and Dr. Sita, if he is available, would make an excellent interviewer as well.

Altering the questionnaire A revised copy of the questionnaire is attached. In terms of the questionnaire itself, some topics should probably be excluded from the original questionnaire, and others should be added. Beginning with those which should be excluded:

- A3. The question about age took up too much time; if this information is thought to be important, the interviewer should just make an approximate guess.
- A5-6. The questions about childhood mortality provide fascinating data, but do not contribute information which is vital for a Vitamin A/general nutrition project. Because of the high number of deaths, this question also took up too much time to justify including it again.
- A16. Unlike Bamako, where some children are described as having "poor appetites," every woman in Macina said that their child always ate a lot of food. This question can probably be eliminated, or else needs to be reworded as suggested on the form.
- A22. People always answered this question as part of question A21, saying that children don't eat when they are sick.
- A23. People always said "no" to this question.
- A24. People always answered "yes" to this question.
- A25. Because children who won't eat are thought to be sick, the answer to the question "why do you worry about children who won't eat" is seen as obvious.
- A26. This question is also superfluous.
- B1-5 are also made superfluous by the fact that the only time children don't want to eat is when they are sick. Children always eat less when they are sick (B1), mothers offer other food, especially moni and milk, if children won't eat because of sickness (B2), mothers never withhold food from children except meat during measles (B3-4), and B5 is covered under A28.
- B6-9 take up a lot of time. Understanding traditional perceptions of malnutrition are important for designing messages to combat malnutrition, but these questions are not absolutely essential for a project focusing primarily on Vitamin A.
- C2. People always said "no".
- C9. People always said "yes".
- C11. People always said "yes".
- C12-15. The questions involving the HKI card didn't work very well because people had trouble recognizing the photos and figuring out what they were supposed to be looking at. Also, symptoms of severe Vitamin A deficiency are so rare in this area that most of the responses were "no" anyway.

Topics which should be added or emphasized. A number of extra questions which were asked, even though not on the original questionnaire, have been added to the revised questionnaire. In addition, questions are needed on the topics of:

1. Prevalence of night blindness among pregnant women, and dietary restrictions during pregnancy.
2. A greater emphasis should be placed on collecting food availability data, including the feasibility of adding more variety to the garden projects already in place, and starting small kitchen gardens inside compounds.
3. A more thorough market study, done in a different season, will give a better idea of food availability. A measuring cup or kitchen weighing scale to assess volume or weight would provide more accurate information about the relative cost per unit of Vitamin A available from different foods. I just made estimates of how many cups, or how many and what size of produce could be purchased for a particular amount of CFA.
4. Information about the feasibility of incorporating Vitamin A rich foods into the CARE garden projects should be collected. A major constraint in these villages is the availability of Vitamin A rich foods. It isn't just a matter of encouraging the increased consumption of Vitamin A rich foods which are already available - not much is available. However, many people seemed ready and willing to try growing new foods - they need wells and seeds and knowledge of how to grow particular foods, and how to incorporate them into the sauces.
5. The apparent gaps in food preparation technology - the cooking of carrots - need to be explored in more detail. Once people know carrots can be cooked and mashed, will they accept this?
6. Factors limiting the consumption of chicken and guinea fowl eggs need to be explored. Can more chickens/guinea fowl be raised? If there were more eggs, would people give them to children? Could special flocks be started specifically for this purpose? [I suggest this because, in Freedom From Hunger's Project in Dogo Arrondissement in southern Mali, the women have organized cooperative groups to raise "extra" chickens and guinea fowl in order to sell the eggs to raise money. They have been very successful.]
7. The questions on general infant feeding practices provide valuable information. Because of the paucity of Vitamin A rich foods in the region, the best hope for decreasing Vitamin A deficiency is to improve the overall nutritional status of the children, so these questions need to be thoroughly explored, especially in terms of what people actually do, not just what they

say. The regularity with which young children are fed needs to be addressed. That is, once a child "starts solids" does he eat several times a day, every day, or only occasionally?

8. The feasibility/acceptability of drying foods in the shade.

MESSAGES

General infant feeding practices, as well as specific Vitamin A consumption could be improved by messages which promote:

- the introduction of solids by 4-6 months, accompanied by messages which
- better hygiene during food preparation and consumption (ie. women washing their hands with soap and water, and washing children's hands with soap and water before they eat); this should help lower the
- incidence of diarrhea, which contributes to Vitamin A deficiency, and offset the disadvantages of the early introduction of contaminated solids
- protein-enriched porridges for children (pounded peanuts, pounded beans - PCVs in the Segou area have had success promoting soy beans, and milk)
- special foods for children like fish, fruits, tomato juice, eggs, cooked and mashed carrots and squash
- the idea that young children need good food more than adults in order to be strong and stay healthy
- family planning which will allow mothers to continue breast-feeding their infants for the entire two years of traditional practice
- the consumption of a varied diet, including Vitamin A rich foods, among pregnant women
- the consumption of each available Vitamin A rich food during its period of peak availability by constructing a calendar of foods rich in Vitamin A for each month or season (e.g. February could be "carrot month" and March could be "mango month") and which
- focus on the benefits to the mothers: well-nourished children won't be sick so often (sick children mean a tired mother), and well-nourished children are happy children (happy children let mothers get their work done)

- encourage the drying of Vitamin A rich foods in the shade, rather than direct sunlight, and
- teach mothers techniques for feeding younger infants, and for encouraging children to eat more food, especially when they are sick

Discussions with the monitrices resulted in the following recommendations for the level of the messages: messages concerning Vitamin A and the prevention of night blindness can be aimed at four levels, from general to specific, and including both prevention and cure. For example:

- (1) "_____ (food) is good for infants and young children,"
- (2) "_____ (food) is good for children's eyes,"
- (3) "_____ (food) protects children against night blindness,"
and
- (4) "_____ (food) helps cure children who have night blindness."

The monitrices felt that most villagers were capable of understanding specific messages at the level of "Carrots help prevent/cure night blindness because they have a lot of Vitamin A." However, everyone agreed with the anthropologist that general messages were as important, if not more important, than specific messages, because not all people perceive night blindness to be a problem, and you don't want people to assume that carrots and other Vitamin A rich foods are only necessary if you have a problem with night blindness, or are only for children with night blindness.

Messages can also be aimed specifically at pregnant women, or alternatively, everyone can be included, for example: "_____ (food) is good for you."

CARE/Macina personnel would like to see messages/materials developed at all four levels, and for all three target groups (children, pregnant women, everyone).

The monitrices use a 3-food group scheme when they talk about nutrition in the villages. Group I foods (carbohydrates) provide energy and force; Group II foods (proteins) help with growth, construction, and repair, and Group III foods (fruits and vegetables) are for protection. Vitamin A rich foods belong to Group III. They said people seem to understand this categorization. Likewise, the concept of "Vitamins" while not well understood, is familiar to the villagers. Doctors in Mali prescribe "Vitamins" for children who have poor appetites or who are malnourished.

The monitrices have introduced a new disease term to the villages as part of their health/nutrition programs. The Bambara term dumuni-dese-bana literally means "food-deficiency sickness." When the monitrices talk about "malnutrition" this is the term they use. It is not a traditional Bambara disease classification, but

it is immediately understandable because the name itself is explanatory, and also suggests the proper cure. Also, it fits well with the traditional belief that a child who is malnourished has a "sickness" of some kind. Better infant feeding practices are then promoted as preventing or curing this disease. I would strongly encourage the continuation of this approach, and the incorporation of this term into messages developed for the NCP/CVA.

MEDIA

Recommendations for media include:

Laminated cards In the past, some of the monitrices have used little posters of ORS preparation as "certificates of participation," giving one to each woman who was able to correctly describe the proper preparation of ORS and when to use it. They said women wanted the posters, and they used them as a bribe/reward. Of course, the poster is then also available for the women to refer to when they need the information. The only problems with this approach are that the people who don't learn the information are the ones who most need access to the posters showing how to prepare ORS. Also, the posters are flimsy and don't last very long. The basic idea is sound, however.

Similar results could be obtained by handing out laminated cards concerning Vitamin A. I envision these as being perhaps 5" X 8" printed on card stock, and ideally laminated, or printed on plastic so they will last for a while. They could be printed front and back with color photos or drawings including such images as good sources of Vitamin A, infants being fed by their mothers or by older children, happy children eating Vitamin A rich foods, gardens where carrots and squash are growing, mothers preparing fortified porridge, mothers cooking and mashing carrots for the baby, etc. Information could be included such as the symptoms of dumuni-dese-bana, information about how easy it is to prevent night blindness, when children should start solids, how to fortify porridge, etc. [Something similar to the HKI brochure, but only one page, and with much simpler messages, in Bambara (and French?), are what I had in mind.]

Probably only one or two related messages should be included on each card - one on each side, perhaps. The cards could be used in conjunction with lectures/coseries/ cooking demonstrations, and then could be sent home with each participant. "Collect all ten!" could be the rallying cry. Perhaps these could be coordinated with the calendar of available foods. "It's March - March is mango month - attend the demonstration and pick up your own mango card!" Because of the paucity of toys, printed materials, photos, and other sources of entertainment in the villages, I predict that children will be very interested in these cards, and will play with

them, talk about them, and distribute them widely. Repeated exposure to the ideas, and the foods pictured, will help spread the messages.

Gris-gris Traditionally in Mali, infants and young children wear "gris-gris" (gree-grees), little amulets worn on strings around the wrist, neck, or abdomen, which help protect them various illnesses and/or evil spirits. Originally, these contained magical herbs and bits of rabbit fur, etc. Since the spread of Islam, they are more likely to contain Koranic verses written on paper, or a combination of traditional and Koranic ingredients. Children also wear necklaces and bracelets just for decoration.

CARE/Bamako suggested that we try handing out small plastic icons, perforated for adding to the gris-gris string, at the conclusion of a lesson or cooking demonstration (again, perhaps in conjunction with a monthly emphasis on one food rich in Vitamin A). For example, one might show carrots, one could be mangoes, one with green leaves, eggs, etc. These could be added to the child's gris-gris as a constant reminder to the mother that children need to eat these foods to protect them from surofeeyen (night blindness) and/or from dumuni-dese-bana (malnutrition).

As with the laminated cards, these little "goodies" could be used as an incentive to get women to attend the sessions, and if women actually put them on the children, then other people (even in other villages) will see them also, ask about them, be reminded daily about them, etc. I think this is a great idea, as long as people understand that the children have to eat these foods, too, that the icons don't work by themselves via sympathetic magic. I think these sorts of extras are called "premiums" by the advertising industry, like the spaceship in the cereal box, or the mix-and-match cards that come in diapers.

Standard cooking demonstrations which would show women how to add Vitamin A rich foods to their sauces, or how to prepare special foods just for the infants and toddlers, should be developed. The monitrices need to expand beyond carrots, especially during times of the year or areas of the region where carrots are not available. The monitrices have done a good job of conveying the message that carrots cure night blindness, but carrots are not always available. Women should be encouraged to make one regular sauce, and then take a small portion of it and add the new ingredient (carrots, green leaves, etc.). That way the family can try the new food, but still have the traditional sauce available in case someone doesn't like it prepared the new way. If the men were included in these sessions, and allowed to taste the new foods, they might be more willing to give their wives permission to experiment, and/or to buy the extra ingredients.

[Realistic-looking, life-size, plastic vegetables are available in the United States. CARE/Macina personnel said they

had a few plastic carrots which they used in demonstrations, and they work much better than the flannel-graph carrots, because they look like real carrots. I offered to send them a variety of plastic vegetables to use in their nutrition lectures, and they were very enthusiastic. I undertook to do this at my own expense, and mailed off a box of vegetables directly to Mark Chorna in early January. Perhaps by the time of the Feb/Mar survey, they can provide some feedback on the utility of the plastic veggies.]

Gardening demonstrations If the project decides to include messages promoting the raising of Vitamin A rich foods in village gardens, then they will need to incorporate gardening demonstrations into their health programs, or develop more linkages between the health and garden projects. One possible source of technical consultants for this aspect of the project is the farmers who grow vegetable crops in Bamako for sale in the local markets. [Steven Dettwyler, a cultural anthropologist, did his doctoral dissertation research among these farmers between 1981 and 1983.]

These men, most of whom are ethnically Senuofo, are experts in the technical aspects of how to grow carrots, nporon, squash, tomatoes, etc., in Mali. They grow phenomenal quantities of produce on very small plots of land, all year round. Daraman Coulibaly, whose garden is directly across Route de Koulikoro from the Chinese Embassy, in Bamako, is the most knowledgeable/successful of these gardeners. It would make sense to bring in local experts such as Mr. Coulibaly to teach villagers how to grow Vitamin A rich foods. I have no idea if this is feasible, but thought it worth mentioning.

Role-playing/skits Puppet theater, especially among the Bozo, and other forms of dramatic entertainment have a long history in Mali. The first symptom of Vitamin A deficiency, night blindness, would be easy to characterize by an actor. Malians think it is funny to see other people trip and stumble and fall down, and would no doubt be amused by someone portraying a person with night blindness. However, underlying that amusement is a very real concern about the disease, and a fear of being blind.

One idea for a skit would involve a group of women, one of whom has night blindness. One of the woman in a focus-group interview said with glee that she once accidentally hit her husband on the head with a calabash when she had night blindness, and the other women in the group thought it was hysterically funny. That incident could be incorporated into a skit. Perhaps one of the other women could then say that she had heard that eating certain foods both cures and prevents night blindness. The women can then demonstrate how the food is prepared, and the afflicted woman can try it. "Several days/weeks later" the woman can be shown recovering from night blindness. Perhaps another woman in the group could be portrayed as being pregnant, and she could conclude

that she will begin eating more of these foods in order to prevent night blindness during pregnancy. Alternatively, a young child could be the victim, though it might be harder to get a little child to pretend he couldn't see very well.

A skit like this would not only convey the symptoms and cause/cure of night blindness, but would also demonstrate the utility of telling other people about your problems and discussing possible solutions. Sharing of information about how to deal with problems, based on personal experience or knowledge learned in other ways, is not a traditional method of handling problems. So a skit in which women bring up their problems, discuss their worries, and talk about different solutions, might get people thinking about this type of cooperative problem-solving, and overcome their reticence about admitting to their friends and neighbors that they have problems.

Slide shows Slide shows are not recommended for several reasons. Each monitrice is responsible for six villages. They live in one village and travel to the others 1-2 times per week, by mobyette. They do not normally work at night, except in the village where they live, and during the harvest, when the villagers are out in the fields all day.

Officially, they are not allowed to work at night, and are not supposed to be out on their mobyettes after dark. Therefore, it will be difficult for them to show slides to the villagers. Also, considering the condition of the roads ("tracks" is a better term) in the project area, slide projectors will not last very long if they are routinely transported on the back of a mobyette. CARE/Macina personnel also feel that a slide show once or twice a year will not have the necessary impact. They prefer to see Vitamin A messages incorporated into the daily, ongoing health activities of the monitrices, which include lectures and cooking demonstrations, but also a lot of one-on-one or small group counseling sessions and informal chatting with the women.

Slide shows could be used for teaching the monitrices and local health personnel about Vitamin A deficiency, however.

APPENDIX

GUIDELINES FOR MAKING INFANT FEEDING OBSERVATIONS EXCERPTED FROM MEMO SENT TO MARK CHORNA, CARE/MACINA, ON 12 DECEMBER 1989

2. I have attached a set of guidelines for the monitrices (all of them) to use to collect infant feeding observation data between now and February. It is very difficult to collect good data during a short visit, especially for a toubab, because people interrupt their normal activities when you arrive. They are used to the monitrices, who can also be more subtle. Please have the guidelines translated into French (!) and give one set to each monitrice. I have also included one notebook for each monitrice, in which they can record their observations. This activity will provide important information for developing nutrition education messages, as well as help the monitrices practice the techniques for making observations. It needn't take up a lot of their time.

5. Would it be possible for Daffa and Mariam to each give a short presentation to the rest of the monitrices explaining what we did during the first study? They can share their experiences working with "the anthropologist" and offer suggestions to help the other monitrices gather information informally (see number 2, above).

GUIDELINES FOR MAKING AND RECORDING INFANT FEEDING OBSERVATIONS (ACTUAL PRACTICES AS OPPOSED TO WHAT PEOPLE SAY THEY DO)

Whenever you notice a child eating or being fed, try to observe and record, without being obvious about it, the following information:

1. Village name
2. Child's age and sex
3. Date and time
4. What the child is eating (be specific)
5. With whom the child is eating
6. Does the child have its own bowl? If not, who else is eating from the pot (adults, big kids, other little kids)?
6. Is the child feeding itself, or is someone feeding the child -
- if someone is feeding the child, how (spoon, gourd spoon, putting food in child's hand, child's mouth)
7. Who decides when to stop eating, the child or someone else?
8. Does anyone encourage the child to eat? How? Bribes? Threats?
9. Does anyone force the child to eat? How?

Also, if you notice that a child who was only nursing is now eating food, note the age/sex of the child; if you notice that a child who was nursing has just been weaned, note the age and sex. If anyone complains of night blindness, note down the village, and age/sex of the person affected.

If there is time, you can also talk with women about what kinds of foods are forbidden during pregnancy. (NOTE: Daffa and Mariam should be able to explain to the other monitrices what kinds of questions we asked. They can do it much more informally, in the course of their regular work.)

MALI VS. NIGER: COMPARISON OF THE TWO STUDIES

A rapid comparison of the data collected in Macina on infant feeding practices and the AED Final Report on "Rapid Ethnographic Assessment of Infant Feeding" in Niger, revealed the following similarities and differences:

Pate in Niger is apparently the same food as toh in Macina, and likewise serves as the staple food in the diet. There is no apparent equivalent to moni in Niger, just as boule is not found in Macina.

Eating patterns are generally similar, except that in Niger, leftovers from the night before are usually eaten at breakfast, while moni is prepared in Macina. Boule is often eaten for lunch in Niger, while millet is usually eaten for both lunch and dinner in Macina.

In Niger, no strong dietary proscriptions during pregnancy were noted. This is one of the areas suggested for in-depth study in Macina.

The two regions show similar proscriptions against giving children pate/toh if they are less than one year old. In both cases, it is reported to give the child diarrhea; additionally in Macina, it is thought to make the child delayed in walking.

The number symbolism of "3" for boys and "4" for girls encountered in various contexts in Mali was also reported for Niger.

The term "weaning" is used in same way in the two reports, to refer to the specific, concrete act of no longer allowing a child to nurse, not a process of gradually introducing solids.

In Niger, as in Macina, boys are reportedly weaned at 23 months, and girls at 24 months. The Koranic justification for these specific ages was not reported from Niger, while in Macina, the Koranic involvement in weaning (prayers, rituals) was not found. As in Macina, children in Niger are weaned as soon as their mother becomes pregnant again. Children who have been weaned "early" in Niger are reported to show loss of appetite and loss weight, and are known as "nassize." This condition sounds similar to "sere" in Mali, but is not apparently attributed to "bad breast milk" in Niger, merely to early weaning.

There is no equivalent to the bitter tonics (guittis) reported in Niger, unless they are referring to what I have called herbal or medicinal teas, which, in Macina, are prepared for specific illnesses.

A number of topics covered in the Niger study were not covered in the more specific, Vitamin A focused Macina study. On the other hand, a number of general infant feeding topics covered in the Macina study were not covered in the Niger study (e.g. control of quantity that children eat, techniques for encouraging or forcing food consumption, access to protein resources in the sauce).