Mrs. Hume ara Kamal

Date

Trainee

March 09, 1992

Attachment 1. (FACE SHEET)

Principal Investigator

ETHICAL REVIEW COMMITTEE, ICDDR,B.

Principal Investigator K.M.A: AZIZ Tra	ainee Investigator (if any)					
Application No. 92-003 (Revised) Sup	pporting Agency (if Non-ICDDR,B)					
Title of Study Development and implemen- pro	oject status:					
tation of nutrition education strategy for ( ) New Study						
promotion of Beta-carotene rich foods as a( ) No change (do not fill out rest of form)						
source of Vitamin A in children						
Circle the appropriate answer to each of the	following (If Not Applicable write NA).					
1. Source of Population:	5. Will signed consent form be required:					
(a) Ill subjects Yes (lo)	(a) From subjects Yes No					
(b) Non-ill subjects Yes No	(b) From parent or guardian					
(c) Minors or persons	(if subjects are minors) Yes No					
	6. Will precautions be taken to protect					
2. Does the study involve:	anonymity of subjects (es) No					
	7. Check documents being submitted herewith to					
subjects Yes (No)	Committee:					
(b) Social Risks Yes No	Umbrella proposal - Initially submit an					
(c) Psychological risks	overview (all other requirements will					
to subjects Yes No	be submitted with individual studies).					
(d) Discomfort to subjects (e) No	✓ Protocol (Required)					
(e) Invasion of privacy Yes (To) (f) Disclosure of informa-	Abstract Summary (Required)					
- ·	Statement given or read to subjects on					
tion damaging to sub- ject or others Yes (No)	nature of study, risks, types of quest-					
ject or others Yes (No) 3. Does the study involve:	ions to be asked, and right to refuse					
(a) Use of records, (hosp-	to participate or withdraw (Required)					
ital, medical, death,	✓ Informed consent form for subjects Informed consent form for parent or					
birth or other) (Yes) No	guardian					
(b) Use of fetal tissue or	Procedure for maintaining confidential-					
abortus Yes (No)	, ity					
(c) Use of organs or body	Questionnaire or interview schedule *					
fluids (Yes) No	* If the final instrument is not completed					
4. Are subjects clearly informed about:	prior to review, the following information-					
(a) Nature and purposes of	should be included in the abstract summary:					
study (Yes) No	1. A description of the areas to be					
(b) Procedures to be	covered in the questionnaire or					
followed including	interview which could be considered					
alternatives used Yes (No)	either sensitive or which would					
(c) Physical risks Yes No	constitute an invasion of privacy.					
(d) Sensitive questions Yes (No)	2. Examples of the type of specific					
(e) Benefits to be derived (Yes) No	questions to be asked in the sensitive					
(f) Right to refuse to	areas.					
participate or to with-	3. An indication as to when the question-					
draw from study (Yes) No	naire will be presented to the Cttee.					
(g) Confidential handling of data (Yes) No	for review.					
of data (Yes) No (h) Compensation &/or treat-						
ment where there are risks						
or privacy is involved in	•					
any particular procedure Yes (No)						
We agree to obtain approval of the Ethical R	leview Committee for any changes					
involving the rights and welfare of subjects before making such change.						

### 1. PRINCIPAL INVESTIGATORS:

K.M.A. Aziz, M.S. Islam & R.B. Sack

### 2. CO-INVESTIGATORS:

M. Yunus & A. I. Chowdhury

### CONSULTANTS:

K. Brown, S.K. Roy, M.A. Wahed & Rukhshana Haider

### 3. TITLE OF PROJECT:

Development and implementation of nutrition education strategy for promotion of Beta-carotene rich foods as a source of vitamin A in children

4. STARTING DATE:

As soon as the protocol is approved

5. DATE OF COMPLETION:

28 months from the start of the protocol

- 6. TOTAL BUDGET REQUESTED: US\$ 173,633
- 7. FUNDING SOURCE:

USAID

8. HEAD OF THE PROGRAMME:

Associate Director
Community Health Division

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### Abstract Summary

This protocol examines the role of nutrition education as a practical solution to vitamin A deficiency by improving dietary practices. It involves two major parts: the development of nutrition education strategy through a community trial, and its implementation to test the approach in improving vitamin A status. Within the first major part there would be an attempt to test the newly designed education strategy through four phases. In this major part in which there would be no control group, 130 randomized children within 6 to 59 months old from the Matlab MCH-FP comparison area would be studied. During the second major part constituting the fifth phase covering the implementation of the newly developed education strategy, the scheduled activities would be undertaken in two new sites designated as study and control at the MCH-FP comparison and treatment areas of Matlab respectively. The number of subjects and sampling procedure would be similar to that of the first major part of this study. The first of the four phases of the educational strategy trial will study availability, knowledge and behaviour regarding beta-carotene rich foods. The second phase will involve development of a nutrition education strategy. testing of the proposed strategy and intensification of home gardening through education and motivation will be undertaken during the third phase. The final evaluation of the proposed educational approach will be done in the fourth phase through a comparative analyses. In the fifth phase there will also be a pilot intervention to test the new approach. In this phase there will be a follow-up regarding the consumption of vitamin A-rich foods. During this phase the estimation of the impact of compliance tested through a health belief model will involve anthropometric survey, clinical examination of eyes for xerophthalmia, biochemical verification through testing of food samples, breast milk and blood After one year of the second part of the study by samples. repeating some surveys undertaken during the baseline study of the pilot intervention the sustainability of the education strategy will be measured. The major outcome variables of this study would include: establishment of a nutrition education strategy aiming at increased consumption of Beta-carotene rich foods, assessment of the impact of the implementation of such a strategy, and finally measurement of the sustainability of the education in terms of knowledge and practice.

### REVIEWS:

a)	Chairman, Research Review Committee:
b)	Chairman, Ethical Review Committee:
e. )	Divoctor ICDDD D.

c) Director, ICDDR,B:\_\_\_\_

### 9. AIMS OF PROJECT:

a) General Aim

To develop a nutrition education strategy that will lead to improved preparation and increased consumption of B carotene rich vegetables and fruits by young children and mothers.

b) Specific Aims

Specific aims in the development of nutrition education strategy will be:

- assess the availability of home garden space and what is cultivated there;
- ii) identify the potentially vitamin A containing foods that are available for household consumption;
- iii) assess present consumption;
- iv) assess beliefs and attitudes towards feeding young children beta carotene rich colored vegetables and fruits;
- v) study the methods of preparation of vitamin A containing foods;
- vi) develop educational messages in improving the preparation and increasing the consumption of beta carotene rich vegetables and fruits; and
- vii) pre-test the messages leading to development of a nutrition education strategy.

In addition, the aims in implementing the education strategy will be:

- (i) to increase intake of beta carotene rich vegetables and fruits in young children and mothers by promoting recommendation dietary intake and their preparation;
- (ii) to assess the feasibility of increased availability of beta-carotene rich vegetables and fruits through intensification of production in home gardens, and increased procurement through purchase and collection from wild sources:

- (iii) to transact nutrition education to the mothers care-givers regarding preparation and consumption of beta-carotene rich vegetables fruits and evaluate the effect education on prevention οf vitamin deficiency as can be identified by clinical examination of xerophthalmic symptoms and vitamin A contents in blood and breast milk following the samples educational intervention; and
  - (iv) to assess the compliance of feeding and acceptability of beta-carotene rich foods following the implementation of the newly developed nutrition education strategy.

Following the closing of pilot intervention there will be a follow up final phaze to assess the sustainability of the nutrition education strategy that has undergone a trial in the fifth phase. The aim in this final phase will be:

a) to assess the sustainability of the pilot intervention of the newly developed nutrition education strategy after one year period of non-intervention in the intervention area of the fifth phase.

### c) Significance:

Of the numerous causes which contribute to vitamin A deficiency, lack of knowledge on beta-carotene foods, wrong beliefs causing inadequate intake-of vitamin A-rich foods, and lack nutritional care to the children and their mothers are important. Education and motivation to the mothers and care-givers of young children on proper dietary management may be crucial for overcoming these problems. Vitamin A deficiency syndrome e.g. night blindness can be prevented by adequate intake of vitamin A-rich foods. Moreover, the dimensions of the benefits of beta-carotene diets are likely to be more than the vitamin A capsule. If regular intake of dietary vitamin A is found to prevent deficiency-disorders, then an important public health intervention would be established. Nutritional education is a more practical solution to vitamin A deficiency disorder since it pursues its objective through the normal diet, without additives or medicines. While initial costs may be high and adaptation to any dietary habit is

difficult, its success may lead to self reliance in vitamin A to improve the situation of blinding malnutrition of children.

Local effort and resources are required to be mobilized to increase people's own capacity to fight against vitamin A deficiency. Communities and households are better able to understand their own problems, and they almost always have untapped resources. Empowering communities to become more self-reliant is not easy, and less so in some cultures than others, but is necessary for poor communities. This study will explore the potential of local resources and readiness to learn from others to increase the consumption of vitamin Arich vegetables and fruits by young children and thus alleviate vitamin A deficiency disorders.

### 10. ETHICAL IMPLICATIONS:

This study will promote the availability and prevalent intake of beta-carotene rich foods among children of 6 to 59ms of age by motivating their care-givers. ascertain compliance of feeding of beta-carotene vegetables and fruit based foods, care-givers of the targeted children will be interviewed by using survey questionnaires and short check-lists and their responses will be validated through participant observation and indepth interviewing. To cross-check the validity of reported compliance and its impact, samples of food, finger prick blood samples from the young children and breast milk from their mothers will be Informed consent will be obtained before undertaking these interviews and observations, and collections of food and biological samples which will not include any sensitive query that can be considered as invasion of privacy. However, taking of blood from the young child is likely to cause discomfort. Before taking of blood samples informed consent from the mother will obtained.

# 11. BACKGROUND, RESEARCH PLAN AND BIBLIOGRAPHY:

#### Background

Vitamin A deficiency is one of the major nutritional deficiencies in Bangladesh (Darnton-Hill, Mitra, 1987). Despite the massive programme of high potency vitamin A capsule distribution, vitamin A malnutrition continues to be a serious public health problem in Bangladesh,

affecting hundreds of thousands of children in the preschool ages (Abdullah and Malek, 1989). There have been three national dietary studies conducted in Bangladesh. 1962-64 first i.n in the then East Pakistan demonstrated that protein-energy malnutrition specific nutrient deficiencies were real problems and in particular that vitamin A intake was low (USDHEW 1966). The two following dietary surveys in what was by then Bangladesh, showed the problem to be apparently even The second in 1975-76 (Ahmad et al. 1977) followed a particularly severe famine in 1975 and may have shown an unusually bad picture, but if so, it was not dissimilar to the intakes obtained in the 1981-82 survey (Ahmad and Hassan, 1983). Low intake of vitamin A is a persistent and growing problem in Bangladesh. this situation efforts must be made to undertake possible measures in promoting the intake. One such potential measure for Bangladesh is promotion of home gardening (Karim and Hassan, 1989) accompanied by education to the mothers or care-givers of <5 years old children.

(Helen Keller International) mobilization of HKI's Voluntary Agencies for Vitamin A Awareness, Promotion and Supplementation project mobilizes indigenous private voluntary organizations to promote vitamin A nutrition education and Vitamin A supplementation. HKI assists seven local NGO's (including CARE and two government organizations each of which has a home gardening component). The overall goal of HKI's vitamin A Home Gardening for Prevention of Nutritional Blindness project is to reduce the incidence of nutritional blindness among marginal and landless peasant families through the cultivation of vitamin A homestead vegetables education concerning the importance of vitamin A in the In 1987 this project began working with 150 families (divided into 24 groups) in northern Bangladesh. Target families received two three-day training sessions on production techniques for different vitamin A-rich vegetables, vegetable bed preparation, compost making seed production, food preparation and overall garden management. Home gardens have been established around the homes, ringwells and even on roofs of the homes of the 24 groups of men and women involved. Every garden is supervised monthly, and meetings are held to discuss issues related to home gardening. Indeed, more than 50 percent of the target families continue to feed their young children vitamin A-rich vegetables from their A baseline survey was conducted in 1988, and gardens. another survey has recently been undertaken to determine the impact of the project. Results are pending (VITAL, potentiality of the replication of the The

procedures applied and found workable remain unclear although the project activities are continuing for about 5 years.

Vitamin A precursor carotenoid can be found in dark green leafy vegetables, yellow vegetables, yellow cereals and tubers, yellow citras and other red and yellow fruits, and red palm oil which are widely available in many parts of the world. These forms of vitamin A cost less than animal products. In most low-income populations carotenoid constitute 80% or more of the foods eaten that contain vitamin A. Carotenoid containing foods of vegetable origin are usually excluded from the diet of young children during the vulnerable period of weaning and post-weaning through the preschool years. In a study conducted by Khan (1980) in a village of Matlab Upazila it was found that before 15 months none of the children was given vegetables. Increasing consumption of green vegetables is considered one ofthe challenging aspects of behaviour change. Moreover, getting someone to sustain a new behaviour has been shown to be more difficult then getting an individual to engage in that behaviour for the first time (Glanz, 1981).

Vitamin A intake has been reported to be inadequate in 90 per cent of rural households and dietary vitamin A meet less than a third of the requirements of young children Bangladesh (INFS. 1977, Brown, 1982). inadequacies are sometimes related to economic constraints which may include insufficient resources for purchasing or producing food; difficult geographic and/ or limited, seasonal access to appropriate foods; and increased time required for obtaining processing, preparing, and storing vitamin A rich foods (Vitamin A Field Support Project, 1991).

There is a strong seasonality in the pattern of vegetable crop and in its availability; and intake of vitamin A and its precursors (Underwood et al, 1989). A list commonly consumed vitamin A-rich foods and their seasonal availability should be compiled and matched against the consumption patterns of the target group of children. This information will be useful to plan improved vitamin A-rich diets, when necessary (Brown and Bentley. n.d.) Discrimination against vulnerable groups such as children and women cause Vit A deficiency (Longhurst and Payne, 1979). Though many food containing B carotenes are only seasonally available lal shak (amaranthus gangeticuss), helencha (enhydra fluctans), thankuni pata (centella asiatica) can be grown and harvested throughout the year in Bangladesh (Talukder e al., 1989). Similarly, papaya

which is rich in carotenoid is also available in all seasons and areas in Bangladesh.

According to a HKI-IPHN survey, 85% of the mothers could not name a vitamin A-rich vegetable and many others considered dark green leafy vegetables as bad for children (HKI-IPHN, 1985). According to another survey in Bangladesh, the per capita daily intake of vegetables in rural areas was found to be 16%, 3% of that was leafy vegetables (Ahmed and Hassan, 1986). In Bangladesh the poor social classes have been reported to consume a major part of their diet from leafy vegetables which would cause fluctuations in vitamin A level. There is dietary and seasonal variation in intakes (Roy et al, 1989). It is estimated that in Bangladesh one million children of 6 months to 6 years old suffer from vitamin a deficiency disorders, 30,000 of which become blind each year with one-half of the blinded children dying within one year of blindness (HKI-IPHN, 1985).

Poverty and low socio-economic status are high risk determinant for vitamin A deficiency. A marker such as the potential to grow nutritious crops on household land, is an important determinant of vitamin A stores in household members.

The household risk factors for vitamin A deficiency include: there being no working watch or radio, access to less than half an acre of land, a household garden smaller than half the size of the main living area, and the mother being without any formal schooling (Cohen, 1989).

Information about local food processing and cooking techniques is required to ensure that programmatic recommendation are compatible with the local practices and available technology (Brown and Bentley, n.d.).

Eighty percent of the housewives in Bangladesh wash leafy vegetables after cutting them into small pieces and then press out the water (Edib, 1979). All housewives prefer prolonged cooking and 64% of them believe that prolonged cooking makes food more digestible and palatable (Quddus, 1984). A study conducted in Bangladesh has assessed the extent of B-Carotene losses in vegetable cooking methods commonly used in Bangladesh (Rahman et al., 1990). This assessment considered the extent of B Carotene loss in vegetables subjected to three traditional methods of cooking practiced in Bangladesh. Boiling for 7-9 min. followed by frying in oil for 4-6 min. in an open pot with stirring and allowing the water portion to evaporate or to be thrown away causes loss of 31-43% of vit A.

Simple boiling for 8-10 min. with the lid of the pot on for most of the cooking time causes loss to 11-14%. Placing vegetables on the surface of partially cooked rice until cooking is done causes loss of 23.11% vit A. The proposed study would promote the second and third of these methods of cooking since they incur minimum loss of B carotene in cooking process.

# Education increased local production of vitamin A-rich foods by the households

In locations where the main cause of xerophthalmia is lack of vitamin A food sources, household food production could be encouraged. To determine whether such production is feasible, information is needed on local food patterns, production potential, input, including fertilizers, seeds, land, and water, and use of land by low-income groups. Education on the importance of kitchen gardens is an approach that has been developed in many countries, with variable success (Talukder et al., 1989). Vegetable production on the roof tops, and within household compounds may be more promising. The proposed study would deliver education on the importance of such approach.

# Interventions at the individual family level:

The traditional and cultural practices often influence selection of food items. For example, green leafy vegetables, yellow vegetables oryellow (GLV/YV/YF) may be a regular part of the family diet but may not be given to young children. This may be related to excessive fibre content in DGLV that is not removed before feeding to children and has become associated with bouts of diarrhoea or cramps. In such cases, a family may accept recipes that reduce the proportion of fibre in the feed of children. It may be helpful to offer the child a recipe that contains an alternative source of vitamin A activity more compatible with a child's tastes, such as sweetened source of red palm. а inappropriate intrafamily food distribution occurs, the intervention is likely to enforce the knowledge on special dietary needs of young children.

According to the Health Belief Model (HBM) shown in Fig. A and presented in appendix 1 (Becker et al., 1977), health behaviour is predicted by beliefs and values in three categories; motivation to avoid illness or get well; perceived vulnerability to, and seriousness of specified illnesses; and perceived probability that compliant behaviour will reduce vulnerability or seriousness. Anthropologic observation can offer insight

to the culture (including folk beliefs), environment, and socio-economic factors that affect acceptance of a programme.

Presumably the greater a mother's motivation commitment to child protection, the more likely she is expected to accept education to reduce risk on child health and nutrition. If education has an independent effect on survival, perhaps it is through its effect on perceptions of vulnerability, seriousness and choice of remedial action. Demographic, structural and enabling factors are included in the model, which is set out in Fig 1. For the purpose of this protocol we are applying model to a child-nutrition-care issue; prediction, acceptability and explanation of care-givers' adherence to diets prescribed for vitamin A sufficiency.

In view of the above analysis of the situation we hypothesize that nutrition education intervention on production and consumption of GLV/YV/YF will lead to increased consumption of such foods by young children and their mothers.

Yarbrough (1981) has observed that it is important for program planners to recognize that increasing household consumption of vitamin A rich foods is a multifaceted process; the behaviours associated with obtaining and preparing vitamin A-rich foods and ensuring that children consume such foods will need to be performed frequently; new information related to food production and preparation may have to be acquired; and collective as well as individual decision making in favour of the change will be required.

### Biochemical and clinical evidence

Biochemical evidence is limited, and mainly derived from hospital based studies (Stoll et al. 1985; Molla et al. 1983). Brown et al. (1980) found in their village study that approximately 20% of the children under 6 years of age had serum levels less than 10 u/dl (Darnton-Hill, 1989). Much of

the clinical evidence for vitamin A deficiency in Bangladesh

comes from the 1982-83 nutritional blindness study which surveyed national prevalence of xerophthalmia (HKI/IPHN 1985).

Breastfeeding was found to protect against xerophthalmia (Roy, 1989).

The distribution of percentage weight for age has been found to be markedly skewed towards lower values for xerophthalmic as compared to non-xerophthalmic children. In the 1982-83 study, in the second year of life, 41.7% of xerophthalmic children were below 80% W/H, as compared to only 11.5% of non-xerophthalmic children (HKI-IPHN, 1985).

In Bangladesh, the following nutrition education strategies are being currently implemented or planned for the reduction of vitamin A deficiency and nutritional blindness (Mitra & Darnton-Hill, 1988: Vitamin A Field Support Project, 1991):

- i) nutrition education as part of on-going government and other health sector activities,
- ii) nutrition education to mothers at the grass-root level, often by volunteer mothers,
- iii) increasing awareness of nutritional blindness and vitamin A deficiency control and prevention among the policy makers, politicians and health managers, and
- iv) general public/ community nutrition education using a variety of media.

The proposed nutrition education strategy stresses the existing ideas and practices with minor modifications that can comparatively easily fulfill the aims of the study.

In this study it is assumed that there may be opportunities in the community to increase awareness of vitamin A deficiency problem, to develop a nutrition education strategy and its subsequent implementation. The proposed study emphasizes identification of community based dietary solutions to prevent vitamin A deficiency by recognizing the existing constraints and utilizing local resources.

### RESEARCH PLAN

## Study design and methodology

This study will have five phases. Until the fourth phase there will be no control group. A sample size of 130 care-givers from the Matlab MCH-FP comparison area who have children 6-59 months will be the participants of this study. Additional inclusion criteria will be children belonging to household with risk factors such as there being no working watch or radio, access to less than half an acre of land, a household garden space

smaller than half the size of the main living area and the mother being without any formal schooling, children of both sexes, residence in the community and unlikely to move out within the project period.

### 1st phase

This phase will study availability, knowledge, behaviour and feasibility of the following:

### Availability

- a) baseline survey of the presence/absence of home garden space;
- b) the vitamin A-rich vegetables and fruits which are present/ absent in the home garden space;

### Knowledge:

c) awareness of vitamin A deficiency and its prevention;

### Behaviour:

d) baseline survey of beta-carotene rich vegetables and fruit intake and cooking methods; and

### **Feasibility**

e) assessment of the level of understanding of the nutrition education messages proposed to be transacted between the female Community Health Worker (CHWs) and mothers and care-givers of young children.

### 2nd phase

This phase will involve development of nutrition education strategy. This will include: 1) identification of appropriate education module for delivering nutrition education to the care-givers; 2) training of the health workers who will provide nutrition education.

The curriculum and training of the health workers will be developed taking into consideration of various field experiences (Appendix - 2).

### 3rd phase

This phase will include the pre-testing of the proposed nutrition education strategy and intensification of home gardening which will have the following agenda:

- a) implementation of proposed nutrition education to the selected care-givers which will include preparation of vegetables and the addition of fats (oil) to the food;
- train and assist the care-givers in growing 'lal shak', misti kumra, and papaya;
- c) monthly monitoring of food intake by doing 24- hour dietary recall and 8-9 hours of participant observation in the homes.

The process indicators of this third phase will be:

- i) numbers of care-givers who start intensifying effort in home gardens;
- ii) increase of coloured vegetables and yellow fruits in the children's diet;
- iii) preparation of vegetables according to the suggestions given.

## 4th phase

The forth phase of this protocol will be the final evaluation of the pre-testing of proposed educational module. Comparative analyses with the baseline data will be done.

### 5th phase

There will be a pilot intervention aiming at efficacy trial of the newly developed nutrition education strategy. In this phase there will be a follow-up of dietary intake and its impact on vitamin A status.

# Design of the study phases

The four aspects of the baseline surveys will be done in the project area by the CHWs who are conversant with the local dialect. A female nutritionist with public health work experience will be responsible to guide them and oversee their activities.

## <u>1st phase - baseline surveys</u>

# 1. <u>Determination of vegetable intake and cooking process</u>

This will be accomplished by KAP survey and filling up of a check-list, 24-hour dietary recall and 8hour participant observation. Each of these tasks will be performed by two CHWs who will be trained by the principal investigators for the specific jobs. These CHWs will be supervised by the project female nutritionist and male senior assistants. The KAP survey, check list questions, dietary recall and 8-hour participant observation will be done according to pre-designed questionnaire (Appendices 3 - 6). The CHWs while doing the dietary recall and the KAP survey will be equipped with a measuring container for measuring the quantity of foods served to the children. measurement will be done using the spoons and utensils used for the purpose of serving reference containers. The intake will be recorded according to frequency, types and approximate quantities. To avoid interviewer bias each of the three variety of surveys will be performed by independent CHWs. For the same household there will be an interval of two weeks between the recall and the participant observation surveys. the participant observation sessions the cooking procedures followed by the care-givers will be recorded.

# 2. <u>Presence of home gardens and types of vegetables</u> which are grown.

The CHWs will assess the presence of home gardens and the types of vegetables which are cultivated. For this purpose all available cultivable lands around the homes and roof tops will be checked.

# 3. Awareness and prevention of vitamin A deficiency-

A KAP questionnaire (Appendix - 3) will be used to assess the care-givers' knowledge and attitude towards vitamin A deficiency, and its prevention, knowledge and use of beta carotene rich vegetables.

# 2nd phase - development of a nutrition education strategy.

A nutrition education module will be developed with a focus on: 1) teaching care-givers about the benefits of vegetables and addition of oil in the diet of young

children; 2) improved cooking process which will lessen the loss of vitamin A; and 3) usefulness of home gardens.

In the design of the education module visual teaching aid will include posters, flash cards containing pictures, and uncooked foods. Interpersonal and participatory teaching methods, two-way communication in the form of group discussion, and cooking demonstration in the courtyard will be employed.

# 3rd phase - pre-testing of nutrition education strategy

### Nutrition education

The trained CHWs will visit the homes of the selected population once a month. They will provide nutrition education cooking and demonstration in the courtyard to a group of caregivers not exceeding 6 to 10 at a time. They will discuss the reasons for and the problems of vitamin A deficiency. Special emphasis will be given on the effects and prevention of vitamin A deficiency in young children. Care-givers will be taught what are the beta carotene rich vegetables. gardens as a viable food source will be promoted through education messages. To facilitate teaching of nutrition to care-givers, the CHWs will be equipped with appropriate visual materials, for example: posters, flash cards, uncooked foods and oil. Small chulas and cooking utensils used in rural households will be provided to the CHWs for cooking demonstration.

The specific messages which might be given by the CHWs will be:

- 1. Vitamin A protects against eye diseases, promotes growth in children and helps prevent other infectious diseases.
- Vitamin A sources are widely distributed in green leafy vegetables (i.e. sabuj kachu shak, lal shak, pui shak, etc.), yellow vegetables (i.e. yellow pumpkin), green leafy vegetables, yellow cereals, and tubers, carrot), citrus and other red and yellow fruits (i.e. ripe papaya, ripe mango), red palm oil, and small fish (i.e. 'mala; and dhela' with heads).

- 3. While feeding the children please remember;
  - for healthy eyes, feed your child green leafy and yellow vegetables, ripe papaya and or mango daily; the mothers should also take these similarly;
  - add a little bit of extra oil to your child's food;
  - a little bit of oil with vegetables will save your child from kukri andhar;
  - start to feed your child vegetables and yellow fruits from the 6th month of age;
  - feed your child vegetables with oil, dal and rice every day.
- 4. GLV can be dried and after grinding the powder can be preserved to make them available for feeding your child throughout the year. While drying cover the vegetables with a thin cloth which will help protecting loss of vit A content.
- 5. You can grow vitamin A-rich vegetables and fruits in your household premises, also you can procure them from other sources.
- 6. Breast milk is an important source of vitamin A, so you should continue to breastfeed your child as long as possible.

For preparation of vegetables and cooking, emphasis will be on:

- washing the vegetables before cutting;
- adding oil to the vegetables when cooking;
- cooking the vegetables in a small amount of water;
- keeping the lid on the pot when cooking;
  - not throwing away the water in which the vegetables are cooked.

Recipes which will reduce the amount of vitamin A loss will be taught to the care-givers. Examples of messages on such recipes will be:

steaming the chopped leaves of pui and lal shak for 8-10 minutes and then adding oil and other condiments to make bharta with the lid of the pot on for most of the cooking time;

frying the chopped vegetables in oil for about 5-8 minutes;

placing vegetables on the surface of partially cooked rice until cooking is done and make bharta by adding oil and other condiments; and

adding vegetables and oil to khichuri.

# 4th phase - final evaluation of nutrition education strategy

The final evaluation will look at changes over time following the introduction of the nutrition education module. Comparison of dietary recall and participant observation data will be done. Vegetable consumption will be compared with the baseline data. Awareness and prevention of vitamin A deficiency will be compared with baseline using the baseline questionnaire. The presence of home gardens and home gardens being the source of vegetables for the family will be assessed especially through utilization of information recorded in check lists (Appendix - 4). The level of compliance to educational messages between the baseline and end of the project will be assessed through in-depth interviewing.

# 5th phase - implementation of nutrition education strategy

In this component the investigation will have a study as well as a control area. These areas will be beyond the nutrition education strategy pre-testing field area. In this phase the populations of study area will be in comparison area and control area in treatment area of the Matlab MCH-FP project. These areas will be randomly drawn from the randomly selected communities of the comparison and treatment areas of the Matlab MCH-FP project.

In the study area the newly developed nutrition education strategy will be implemented during this phase of the study. The nutrition education aims at removal of cultural constraints on the use of vitamin A-rich foods and improved ways of growing beta-carotene rich vegetables, as well the process of preparing and feeding the children will be delivered monthly by means of posters and flash cards containing pictures and messages,

verbal messages and cooking demonstration in groups of 6 to 10 care-givers. Compliance to the messages will be measured through KAP surveys, monthly 24-hour dietary recall, participant observation of cooking and feeding practices, and in-depth interviewing in both the groups (Appendix - 9).

While the non-recipients of vitamin A capsules will form the study or intervention group children, the children who take vitamin A capsules 6 monthly along with routine foods will form the comparison or normal children. Mothers of control children will receive no nutrition education from the project source. In spite of the educational interventions for 12 months in favour of the use of beta-carotene rich foods among the mothers or care-givers of study children, if any of the children are found deficient in vitamin A either clinically through quarterly examinations or by serum (Appendix - 8), then vitamin A capsules will be provided to the relevant children and records will be kept and data would be analysed separately.

In both group the KAP survey through interview of mothers will be done by sociologists. The Community Health Workers will collect information as participant observer on meal preparation and serving as well as child care during monthly surveillance. Observations will be made specifically on the composition οf meal preparation, cooking process, types and quantity of foods being served and the method of serving. During her monthly surveillance visit, a community health worker will enquire about types, quantities and frequencies of meal served to children during the past 24-hours. doing this study tables of nutrient composition Bangladesh foods (Damton-Hill et al., 1988) will be used for classifying the habitual and recommended foods into groups of high, moderate, or low levels of vitamin A deficiency.

The study site:

### Rural Matlab

The size and characteristics of the population:

The study group will consist of 130 households (Appendix - 7) distributed in several village communities. Each of the household will have one study child only - within the range of 6 to 59 months of age. In each of these villages the ICDDR, B maintains a routine registration of birth, death, in and out migrations.

Justification of sample size for the collection of food samples, breast milk and finger prick blood

### Food sample

While planning the collection and testing of food samples it has been assumed that there may be a maximum of 25 varieties of cooked food items for feeding the young children. Each type of food sample will be tested on 10 occasions during each of the 4 periods of collection and testing. The periods include baseline, and the sessions of winter, summer and monsoon.

It is expected that if one type of food is tested on ten occasions the range of vitamin A contents will be tapped adequately through laboratory tests. To assure representativeness of food samples the selection of samples will be done randomly. The food samples will be done in both the study and control groups.

### Breast milk samples

While planning the collection and testing of breast milk samples it has been assumed that during each of the collection periods of baseline and 3 seasons such as winter, summer and monsoon if breast milk samples are obtained once from 30 mothers from each of the study and control groups then the range of vitamin A contents in breast milk samples will be adequately measurable. At the same time the variability in the breast milk composition as the lactation period progresses will be assessed. It is assumed that out of the each group of 130 old children.

The sample of breast milk from 30 mothers will give a reasonable estimation of vitamin A contents.

### Pinger prick blood mosples

of study and control 130 children, 40 delibera will be randomly selected. This will allow 30% representation which is expected to reflect the full range of vitamin A status as measured by the modified relative dose response (MRDR) and the tests are currently under progress in the ICDDR, B laboratory (Tanumihardjo, 1990.

The study population:

The children of the study will be selected based on purposive sampling from the randomly selected village communities of comparison as well as treatment area of the Matlab MCH-FP Project according to the requirement of the proposed two components of the study.

In the selected households the risk factors will include such as no working watch or radio, access to less than half an acre of land, a household garden space smaller than half the size of the main living area, and the mother being without any formal schooling. Programs to prevent vitamin A deficiency must make vitamin A or carotene rich foods more available and must successfully promote their consumption by high-risk populations (TVACC, 1991).

### Training of field workers:

For the successful implementation of the project the Supervisors and Community Health Workers will be trained according to a pre-set curriculum (Appendix - 2) to perform the tasks as proposed. Regular follow-up sessions at monthly interval will be organized to ensure that expectations are clear, to provide reinforcement and encouragement, to elicit feedback on implementation constraints, and to solve problems encountered during project implementation.

Training would be structured around the tasks that supervisors and workers will be asked to carry out and therefore, should be able to deal with necessary knowledge as well as with the attitudes and skills required to communicate effectively with the household member specifically the care-givers.

Chart showing the flow of activities according to period of development during the phases I-IV, implementation period during phase V, and sustainability during the final phase.

Development of Nutrition Education Strategy during phases  $I\!-\!I\,V$ 

### STUDY DESIGN

Selection of one area from the comparison area of the Matlab MCH-FP Project for the pilot trial in developing a nutrition education strategy SURVEYS DURING BASELINE AND DEVELOPMENTAL PERIOD OF SIX MONTHS

- Baseline KAP survey to be repeated at β monthly interval during development
- Monthly nutrition education during development period
- Baseline 24-hour dietary recall to be repeated at a monthly interval during development
- Baseline participant observation to record preparation and consumption of B-carotene rich foods to be repeated at 3-monthly intervals during development
- Baseline in-depth interviewing on compliance of intake of B-carotene rich foods to be repeated at 6-monthly interval during development

1

DEVELOPMENT OF NUTRITION EDUCATION STRATEGY THROUGH COMPARATIVE STUDY BETWEEN BASELINE AND INTERVENTION

Implementation of Nutrition Education Strategy during phase V.

### STUDY DESIGN

Selection of two areas from the comparison and treatment areas of the Matlab MCH-FP project study, and control, in conducting a pilot implementation of the newly developed education strategy

SURVEYS DURING BASELINE AND INTERVENTION PERIOD OF 12 MONTHS

- Baseline KAP survey to be repeated at 6 monthly interval during intervention period in both the areas
- Monthly nutrition education during intervention period in the study area only
- Baseline 24-hour dietary recall to be repeated at a monthly interval during intervention in both areas

- Baseline participant observation to record preparation and consumption of B-carotene rich foods to be repeated at 3-monthly intervals during intervention in both areas
- Baseline in-depth interviewing on compliance of intake of B-carotene rich foods to be repeated at 6-monthly interval during intervention in both areas

个

PILOT INTERVENTION OF NEWLY DEVELOPED EDUCATION STRATEGY

### STUDY OF THE IMPACT OF COMPLIANCE BEHAVIOUR

- Baseline anthropometric survey (i.e. height, weight and arm circumference to be repeated at 3-monthly interval in both the areas (i.e. study and control)
- Baseline clinical examination of eyes for xerophthalmic symptoms to be repeated at 3monthly interval in both the areas
- Baseline food samples from cooking pot used by young children and or mother to be repeated seasonally at an interval of 4-months in both the areas
- Baseline breast milk samples from lactating mothers to be repeated seasonally at an interval of 4-months in both the areas
- Baseline finger prick blood samples from the targeted young children in both the areas to be repeated in both the areas at the end of 12-months of intervention in the study area.

1

BIOCHEMICAL VERIFICATION, AND TESTING OF A HEALTH BELIEF MODEL THROUGH IMPLEMENTATION OF A NUTRITION EDUCATION STRATEGY

Food samples, blood and breast milk samples will be collected in the study and control groups covering the implementation of education strategy (Appendix - 8). In

addition to the baseline samples of food and breast milk these sample collections will be repeated seasonally, whereas, in addition to the baseline samples of finger prick blood from young children one more sample will be obtained at the 12th month of education strategy implementation. More details on biological samples are noted in Appendix - 8.

The baseline KAP survey questionnaire and topics of indepth interviewing will take into consideration the variables that are indicated in figure A shown in the Appendix - 1. By using the theoretical framework as shown in figure A it will be possible to collect information on the specified variables with a potential for a meaningful analysis. These variables will include information on child care practices that will reflect readiness to undertake compliance behaviour in relation to recommended dietary practices.

It is estimated that three months will be needed for preparation before undertaking the trial of the proposed nutrition education module, which will require six months. Three months will be needed for analysis and report writing. During these three months baseline surveys will be done in both the study and control groups designated for the implementation of education strategy. In implementing the education strategy 12 months will be needed for intervention and evaluation and four months will be required for analyses (Appendix - 9).

Testing of Sustainability of Nutrition Education Strategy during the Final Phase.

One year following cessation of the pilot intervention on the 37th month of the project, and 13th month following the pilot intervention in the project there will be an assessment regarding the sustainability intervention of the newly developed nutrition education To achieve this certain specific information strategy. will be collected using the same methods as followed . during the baseline data collection in the intervention area. These information will be collected through a KAP survey, 24-hour dietary recall on the consumption of vitamin A rich food by young children and their mothers, participant observation to ascertain intake of vitamin A rich foods and assessment of the presence of plants, vegetables, and creepers having betacarotene contents in the home garden will be done. findings of this final phase will be compared with the baseline findings of the pilot intervention undertaken in the fifth phase.

TESTING OF SUSTAINABILITY OF NUTRITION EDUCATION STRATEGY INTERVENTION

### Enrolment of subjects:

### Informed consent:

Informed consent will be obtained from parents (preferably care-givers) of all children before their participation in the intervention. Care-givers will be fully informed about the trial of the proposed education messages, implementation of the education strategy and collection of food, blood and breast milk samples. Freely given consent for the subjects to participate will be obtained in writing. The consent form in simple and understandable language will state:

- the benefit of the study
- finger prick blood from the study children and food samples from their cooking pot
- inconvenience (if any) caused
- length and frequency of the follow-up

The consent form will also clearly state the mother's right to withdraw her child as well as herself from the study at any time. The field worker (e.g. sociologist, CHW) will obtain the informed consent from the caregivers.

### Exclusion criteria:

Subjects with the following criteria will be excluded from the study:

- 1. Children or mother critically ill or with chronic illness with metabolic disorders and severely malnourished
- 2. Children and mother who will refuse to cooperate as subjects

### Expected outcome:

At the end of the project period based on the trial and outcome of education messages, a module for nutrition education found to be suitable in the study population will be prepared. Through the implementation of this education module it might be possible to promote availability and consumption of vitamin A-rich vegetables

and fruits leading to an assessment of the impact on vitamin A status in children and their lactating mothers of rural communities of Bangladesh. The promotional activities as indicated in appendix - 9 can be addressed through extension activities at the community level after the results of both the development and implementation of nutrition education envisaged in this study are analysed.

### Functions of investigators:

- K.M.A. Aziz will contribute to the anthropological and sociological aspects of the study by analysing the behavioural issues. He will have responsibility for implementing both the components of the study especially with reference to the innovative ideas and traditional beliefs and practices. He will train the field workers, emphasizing the behavioural elements associated with the intervention. He will have overall responsibility for implementation of the project particularly with reference to the collection of information according to the workplan.
- M.S. Islam will contribute by planning the sociological aspects of the study. He will be responsible for the supervision of data coding, data entry and preparation of tables.
- R.B. Sack will contribute in data analyses and their interpretation. All the investigators will collaborate in writing the final report of this project as well as in preparing papers for publication.
- ${\tt M.}$  Yunus will contribute to the nutritional and medical aspects of the study. He will take part in the analyses of these aspects.
- Mr. A.I. Chowdhury will assist in data management and analysis, particularly with respect to the statistical aspects.
- S.K. Roy and Rukhshana Haider will be consultants particularly with respect to the nutritional components of the study.
- M.A. Wahed will be the consultant responsible for the laboratory aspects of the study.

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FIGURE A: THE HEALTH BELIEF MODEL (Modified to meet the requirements of the protocol)

READINESS TO UNDERTAKE RECOMMENDED

MODIFYING AND ENABLING FACTORS

COMPLAINT BEHAVIOURS

COMPLIANCE BEHAVIOUR

Motivations
Concern (general) about child's health
Concern (general) about possibility of
child getting sick
Positive health activities
Intention to comply

Perceived threat posed by illnesses or conditions
Worry about illnesses child gets
Seriousness (potential) of specified illnesses
Severity of present problem - possible bodily harm/interference with social functioning

Perceived probability that complaint behaviour will reduce the threat Faith in doctors and medical care Perceptions of the proposed regimen's efficacy to prevent delay or cure the problem

Feelings of control over problem

Demographic/social
Age, sex, marital status,
income, education
Family structure.
Perceptions of regimen's safety,
complexity, cost, accessibility,
duration, difficulty
Prior experience with action,
condition or regimen
Extent of family problems

with preventive health
recommendations and
prescribed regimens
e.g. feeding of beta carotene
rich foods to young children

Likelihood of compliance

The health belief model and prediction of dietary compliance: a field experiment. J Hlth Soc Behav 1977;12:348-366. Source: Becker MH, Maiman LA, Kirscht JP, Haefner DP, Drachman RH.

### Appendix - 2

### Curriculum of health workers

The curriculum of the health workers will be developed in collaboration with the community health educator and nutritionists. The teaching methodology wi11 focus on interpersonal and participatory learning methods. Training of the health workers will involve role plays and demonstrations. Visual aids such as pictures and uncooked foods will be used.

The technical aspects of the training will focus on:

- the causes and prevention of vitamin A deficiency
- the identification of beta carotene rich vegetables
- the availability and accessibility of beta carotene rich vegetables
- the benefits of feeding young children vegetables
- the necessity of adding oil to the food of young children
- preparation of vegetables before cooking
- cooking methods and recipes which will diminish the amount of vitamin A loss
- foods which complement each other, e.g. dhal with rice is approximately equal to rice and fish as protein source
- benefits of exclusive breastfeeding until the child has completed four months
- introduction of vegetables to child's diet from the age of six months
- continuation of breastfeeding for two years
- mixing the vegetable torkari and rice
- the necessity of not feeding the child plain rice first
- home gardens as a viable food source.

In teaching nutrition education to care-givers, the health workers will be equipped with pictures and uncooked foods. Cooking equipment will be provided for field demonstration.

# Appendix - 3 KAP Questionnaire

Information to be collected from the mother/care-giver):

Village name:Pre-test component	Education
orgreat imprementation combought	
Name of mother Age Marital status  Id. No	<del></del>
rather's occupationEducation: Father Mother	
LGWITTA TICOMG/MOUTU-IK	
Presence of working watch or radio in the household? Yes	No
Access to less than half an acre of land: Yes No A household garden smaller than half the size of the main living	
YesNo	area:
Information on children (6m-59m):	
Name Id No. Age/DOB Birth order Currently breastfed Yes/No (Months)	Previously breas Yes/ No
If any child in the household is blind or suffers from night Yes No	blindness?
If yes, Age/DOB Sex Duration of illness	
Has the child difficulty in vision in dim light or at dusk? Yes No	
Does the child stumble in late afternoon twilight or grope foobjects in a dim light? Yes No	r
Has any practitioner been consulted for this ailment? Yes	No
Can the respondent (mother, other :specify relationship to to thild) name any foods that may help in preventing blindness?	he
If yes, what are they?	
If any child in the household received any vitamin A capsule?	
How is a vitamin A capsule administered ?	
loes the respondent know what the vitamin A capsule is for?	
f yes, state what?Source of information	

# Appendix - 3 (Cont.)

What is the usual type of milk given to children from 12 months to 2 years of age?  * Breast milk  * Animal milk  * Commercial formula  * Type of milk given to the ego (study child):
What breast feeding practices are followed?
* Are other foods or drinks routinely given to breast-fed infants below 12 months of age? What about ego?
* When is breast-feeding stopped? What about ego? * Why is it stopped? Why in the event of ego? * How is it stopped? How in the event of ego?
How are breast milk substitutes used?
* What foods are used (e.g. animal milk, commercial infant formula)? How about ego?
* How is the food prepared? Is it diluted? Is hygiene good? What about ego?
* What feeding utensils are used (e.g. feeding bottle and teat, cup and spoon)? What about ego?
What weaning practices are followed?
* At what age are weaning foods (soft and semi-solid foods) introduced? What about ego?
* What foods are used? What about ego?  * How are they prepared? Was/is it applicable for ego?  If otherwise, describe
What foods are available and are they:
<pre>* common? * affordable * easily digestable? * culturally acceptable? * B-carotene-rich?</pre>
Do the available foods contain important nutrients, especially B-carotene?
Are vegetables (specify:)eaten by the mother of the child and ego Frequency of eating by mothers by ego
If the reply is affirmative, what is the source(s) of advice for such intake?

What	do	people	believe	about	B-carotene	rich	foods	and	diseases
such	as:	night	blindnes	ss?					

- \* How are foods classified locally?
- \* Which foods are believed to cause night blindness and why
- \* What other causes of this disease are believed to exist?

What are the symptoms of night blindness? How blindness can be prevented and treated? What are the usual feeding practices during night blindness?

- \* Is breast-feeding continued, done less frequently or stopped?
- \* Is food intake restricted?
- \* If so, is restriction complete or partial and how long does it continue?
- \* Are any food avoided during night blindness? If yes, name them:
- \* Is any foods recommended? If yes, when are they given, how much given and how are they prepared?
- \* Breast-feeding status: Yes \_\_ No \_\_\_, Exclusive B.F. (no water. --- Predominantly breastfed (no other milk or food) but water, honey, misri acceptable ---
- \* In the event of night blindness any foods and feeding methods are specifically advised by any of the sources such as, family members, local health workers including doctors and traditional practitioners, mass media like radio, TV, poster.
- \* To cure night blindness are any other treatments used (e.g. herbal remedy, magical methods, etc.)

_	
*	Age of introduction of food items in the diet of the ego.
*	Other milk
	vegetables (specify type:)
*	rice and wheat as a liquid or semisolid preparation
*	supplementation of rice and bread
	supplementation of fish, meat, or eggs

Blood sample obtained: Yes

sample	obtained: Yes		No	<b>)</b>
	(Day/Moi	1th/y	ear	
	Interview done by:			
	Date of interview:			
		Dav	Month	Year

## Appendix - 4

## A Checklist of questions

(Information to be collected from the mother/care-giver)

Village name	Pre-test component	Education
strategy implementation	component	
Name of the mother	Id. No	
Consumption of food:		
	family (mother of ego incorrevent night blindn	
deficiency in children?		
Yes	No	
II NO, WILLY!		
If yes, what foods are a (Please specify the item	eaten in the following ca ms):	tegories:
Green leafy vegetables:		<u>-</u>
Yellow vegetables:		
Yellow Fruits:		
	of these foods to your c	
If yes, why		
	he following categories yourself, buy and or	
yellow vegetables	:	
Growing Food:		
	y food rich in beta-carot ng categories: (please sp	
Green leafy vegetables yellow vegetables Yellow Fruits	E	
	to improve their growin	ng methods cheaply

# Appendix - 4 (Cont.)

	me liems to sell, instead of food
to eat? Yes	No
Can your family keep enough seed	ds for the next year's planting?
Yes	No
	No o receive seeds for growing? No
	ases attack the plants while they
	spots in and around your home to
If yes, what are those spots? (Please specify)	
How much area is covered under of please specify in terms of yard	those spots: ds/feet etc.)
Plantation record: Type: Time of production Quantity	Time of sowing Per week
	Interview done by
	Date of interview

# Appendix - 5

# Monthly 24-hour and weekly recall surveillance form

ency of breast	feeding per day  5 0 =	Once = 1 Twice = 2 3 times = 3 4 times = 4 or more = 5 Hever or no longer breastfed  de as above	
ency of breast	feeding per day  5 0 = feeding Co	Once = 1 Twice = 2 3 times = 3 4 times = 4 or more = 5 Hever or no longer breastfed  de as above	
ency of breast ight items consumed	5 0 = feeding Co	Twice = 2 3 times = 3 4 times = 4 or more = 5 Hever or no longer breastfed  de as above	
ency of breast ight items consumed	5 0 = feeding Co	Twice = 2 3 times = 3 4 times = 4 or more = 5 Hever or no longer breastfed  de as above	
ight items consumed	0 = feeding <u>Co</u>	Twice = 2 3 times = 3 4 times = 4 or more = 5 Hever or no longer breastfed  de as above	
ight items consumed	0 = feeding <u>Co</u>	3 times = 3 4 times = 4 or more = 5 Never or no longer breastfed  de as above	
ight items consumed	0 = feeding <u>Co</u>	or more = 5 Hever or no longer breastfed de as above	
ight items consumed	0 = feeding <u>Co</u>	Never or no longer breastfed de as above	
ight items consumed	feeding Co	breastfed de as above	
ight items consumed	<u>Co</u>		
items consumed			
	by the child durin	g the last week:	
etables:	consumed Daily/Weekly	consumed (Grown/bought/	
<del>.</del>	Child/Mother		child too young, bad for the child,
		Child/Mother	Others
			Child/Mother
		·	
es:			
		-	
		<del></del>	
		Child/Mother	Child/Mother Child/Mother

foods consumed by the chi	<u>ld (ego) during the</u>	last	24 hours	<b></b>
Categories of foods	Freque Servicing s			
Green leafy vegetables:				
				_ _ _
				<del>-</del>
ellow vegetables:				
				<del>-</del>
(-))		·		<b>-</b> .
ellow Fruits:		· · · · · · · · · · · · · · · · · · ·		_
				<del></del>
				_
	Interview done by			<u></u>
		Day	Month	year

#### Appendix - 6

Guidelines on 8-hourly participant observation of dietary practices.

An eight hour observation period of dietary practices will be done monthly. The observer will be present at the home from 7 a.m. to 3 p.m. in the evening. Due to logistical reason, the observer will not be able to observe the evening meal as sit is normally taken around 7 p.m. Similar to the dietary recall, the nutritionist will record all the foods including breastmilk consumed during the observation period. She will be equipped with a pre-designed checklist to record the following:

- the preparation and the cooking methods of vegetables
- the addition of oil to the vegetables
- all foods eaten during the period of observation
- the time the food was eaten
- the mixing of rice with the vegetable torkari when feeding the child
- the portion of the food which was vegetables
- the types of vegetables which were eaten.

In the preparation and cooking of the vegetables, she will note if the vegetables are washed before cooking; cooking duration of the vegetables; style of cooking the vegetables, i.e. boiled, steamed or fried; water from the cooked vegetables retained or discarded; and if the vegetables were cooked in a covered or an uncovered pot. The checklist will have all the various serving utensils which are found in rural home.

The observer will be careful to offer no comment on the preparation and cooking of vegetables or on the serving of the vegetables to children.

#### Appendix 7

#### SAMPLE SIZE

Comparison of outcome variables between the intervention and control groups will be performed at the end of the study.

a) To determine impact on consumption of Vitamin A rich food Brown et al reported that 20% under 5 children consume Vitamin A rich food. At the end of the study we expect that 50% children will consume Vit.A rich food in the intervention group. Based on this information to detect this difference the required sample size (90 percent power and alpha=0.05):

#### N = 53 in each group

b) To determine impact on B-carotene consumption Brown et al reported that 15% children consumed Vitamin A in the form of B-carotene. It is expected that this will increase to 75% at the end of the study in the intervention group. Sample size (90 percent power and alpha=0.05) required to detect this difference is:

$$\frac{2 \times 0.45 \times 0.55}{0.6 \times 0.6} \times 10.49$$
N = 15

c) Brown et al found that only 2% of children consume Vitamin A rich food at the age of 24 months. We expect that this be 20% in the intervention group at the end of this study. In order to detect the difference between two groups the required sample size (power=90 percent and alpha=0.05):

$$\frac{2 \times .11 \times .89}{(.18 \times .18)} \times 10.49$$

N = 64

d) Brown (1982) and Khan (1980) found that 55% of under 5 years old children consume vitamin A-rich food. At the end of the study we expect that 75% of the children will consume vitamin A-rich food in the intervention group. Based on this information to detect this difference the required sample size will be (90 percent power and alpha=0.05) as follows:

Appendix - 7 (Cont.)

 $\frac{2 \times 0.65 \times 0.35}{.20 \times .20} \times 10.49$ 

N = 120

Considering each of the conditions above, the maximum sample size works out to be 120 in each group. To cover the possible drop out we propose that the sample size should be increased to 130 in each group. Thus the final sample size will consist of 260 children in the two groups.

# Appendix - 8

Food, breast milk and blood sample collection procedure and collection schedule

Sample type	Procedure of sample collection	Total samples including baseline	<u>Iotal for</u> areas
Food	Assessing that 25 varieties of such foods exit and 10 samples collected from each there would be 25X10 = 250 samples per season	250X4 = 1000 (Baseline and the season of winter, summmer and moonsoo	1000X2 = 2000 n)
Breast milk	To be collected from 30 mothers per season	30X4 = 120 (Baseline and the seasons of winter summer and moonsoon	120X2 = 240 )
Finger prick blood (for MRDR)	To be collected from 40 children at baseline before any intervention and once more at the end of intervention after 12 months	40X2 = 80	80X2 = 160

# Appendix-9

# Action plan for 28 months Time schedule in months

1 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17	17 18 19 20 21 22 23 23 24 25
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KAP surveys	
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Food Sampling	
Pre-testing ofaducation messages	
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ICDDR,B Proposed Budget for Vitamin A Protocol For 28 months from April 1992 to July 1994

Particulars	% of time	1992 (Apr-Dec)	1993 Jan-Dec	1994 Jan-Jul	Total US\$
Personnel					
E.W.A Asis	70%	13,220	17,627	10,282	41,129
M.S. Islam	30%	3,530	4,707	2,746	10,982
A.I. Chowdhury	15 <b>%</b>	933	1,244	726	2,903
Physician (fellow) (1)	100%	0	1,250	729	1,979
Sociologist (fellow) (2)	100%	2,000	2,667	1,556	•
Nutritionist (1)	100%	4,024	5,365	1,130	12,519
Rubul Amin (R.A.)	100%	3,567	4,756	2,774	11,097
Wasir (Sr. H.A.)	100%	•	5,709	3,330	13,322
CHWs (8)	100%		4,800	2,800	
Jr.Programmer (1)	10%	500	667	389	1,556
DRT	20%	645	860	502	
Country boatman/porter (4)	100%			1,377	•
Clerk typist (Gr II LV III) (1)	50%	,	4,805	2,803	11,211
Total Personnel		41,875	56,816	33,143	131,633
Local travel, transport, perdiem		6,000	8,000	3,000	17,000
Printing		500	500	. 0	1,000
Supply/Stationary		2,000	3,000	500	5,500
Computer		200	300	1,000	1,500
Kerope Miniography		200	200	100	500
Medical Illustration		100	300	100	500
Lab./bio chemical test		0	11,250	3,750	15,000
Educational materials		500	500	0	1,000
Total Travel, Printing, Supply etc.		9,500	24,050	8,450	42,000
Grand total US\$		51,175	80,866	41,593	173,633

MCRPP Feb92

Research on development and implementation of nutrition education strategy for promotion of Beta-carotene rich foods as source of vitamin A in children

#### 'Consent Form'

Every year many children in Bangladesh become blind due to lack of vitamin A in diet. These children can be protected from blindness if they are provided with vitamin A-rich foods. Nutritional blindness can be prevented if the correct information are known and the required rules related to food intake are followed.

A research project has been undertaken to evaluate the role of food adaptation in filling the gaps of vitamin A in food habits and in the determination of the type and level of success required in preventing blindness. The task of this project will be completed in two phases. On the basis of some pre-determined socio-economic criteria, a child aged between 6 to 59 month will be included from every selected family in either the first or the second phase of this project. During the 1st phase, a new nutrition education strategy for the promotion of foods as a source of vitamin A in children and mothers or care-givers will be conducted on an experimental basis. During the 2nd phase two different areas will be selected, one of which will have nutrition education input and the other without it. The area with nutrition education input will have provision to test the experimented nutrition education strategy for assessing its effectiveness. In doing this assessment several surveys and data collection will be carried out area with nutrition education input as well as in the area without it to accomplish a comparative analysis. The topics of these surveys and data gathering are knowledge, attitude and practice related to vitamin A; determination of vitamin A level of children's eyes; measurement of children's weight, height and arm circumference; Vitamin A-rich food intake by children based on a 24-hour recall by mother or care-giver; children's food intake based on 8-hour participation observation method: interviewing to ascertain vitamin A intake through diet by the mother or care-giver and the child. These surveys or data collection will be repeated from two to four times. During the 2nd phase, a few drops of blood from finger tip or vein of child will be collected 6 or 12 months apart (two times) from both the Besides, to ascertain the amount of vitamin A and level of carctene, small portions of food as sample from meals prepared for you and your child will be collected. These food samples will be collected four times - initially and during the winter, summer and Breast milk (2/3 tea spoonfuls) from the mothers rainy seasons. of study children will be collected four times for examination.

There are three ways in which you can participate in this research e.g. (1) to determine the mode of nutrition education regarding vitamin A; (2) to assess the impact of implementation of nutrition education; and (3) what may be the consequence if nutrition education is not given. We now invite you and your child to participate in any one of the three pre-determined choices. During our research, ranging between 9 and 12 months respectively, if your requirement of vitamin A is not fulfilled through food intake, we will compensate the deficiency by providing vitamin A capsule and necessary advice.

I like to assure you on behalf of the researchers of the Project that confidentiality of all information given about you and your child will be fully maintained. By participation in this project neither you nor your child runs any risk of facing danger. Participation in this project by you or your child completely depends on your choice. Even if you do not agree to participate in this research there is no chance of any damage or fear to be faced by you or your child. You can ask us any question you like about our research and we are ready to answer to your questions correctly. You can withdraw your consent any time you like. If you agree to the above conditions and wish to participate in our research along with your child, please sign or put your thumb impression below.

Signature of interviewer	Signature or thumb impression of mother/guardian
Date:	Date:
Signature of researcher	
Date:	

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निवंद कार्डिक अहम है, ए एत्रित्या किरान्त्र कामक विकासित्य के कार्डिक कार्य लासे यह कार कार कारिक इपस्तीक क्रिक्सिक क्रिक्सिक है, त्रिक शिक त्यक एर कुराया कामें कारा कथा करा ता है। स्मेर कारा क्षेत्र कारा क्षेत्र कारा क्षेत्र कारा क्षेत्र करा है। echeralten mière emelle raice optieté livre inclavité exiéres लासे किश्व अधि असे भारत। ज्ञानाम हित्साम (१,० ताका० मैंबांन् कुर्तामा कुमातामा आवितान goy 3 still mad colle colle rape the colle rues and alite i est (अग्रें क्रिशिक मिश्रिक प्रक्रिक अविशें अंड ति कार क्रिक्ट क्यार कार्य क्यार अवं उसमी 3 (2) हार का सार्व हत्री अपने के क्यों मार्गित हास्यात (3), इसमी १ एने संस्थान से क्या कर एकिन हमा कार्य है है अर्थ रिवा से सारा हास्य - अरमेश्वर क्षेत्रक क् enter a news cours repended estables of this of the meter र्या कर्म कार्वाचर प्रकाशिक कर्वे रिका विदे महेस्सर आस्मित्वं क्या विष्यास्थाप शिक्षिया के द्रात्य करते स्थाप करते कुर के कर अग्रिश महिस्स्या उत्तर हिर्मित (१) उस स्मिक्सि कार्य कार्य कि कि कि कार्य कार्य के स्मिन उस स्मिन अवस्था कार्य के स्मिन कार्य कार्य कार्य के स्मिन कार्य कार्य के स्मिन कार्य के स्मिन कार्य के स्मिन कार्य के स्मिन कार्य कार्य के स्मिन कार्य कार्य के स्मिन कार्य के समिन कार्य कार्य के समिन कार्य के समिन कार्य के समिन कार्य क क्रिक्षित हित्या (१) रेड्य तथा हिस्से हिस्से हिस्से हिस्से हिन्हिर हिस्से भारता क्षेत्रकार वेद्राक क्षेत्रक निवास क्षेत्रक विश्व होते क्षात्रक क्षेत्रक विश्व क्षिया होते क्षात्रक क्षेत्रक विश्व क्षिया क्षेत्रक विश्व क्षिया क्षेत्रक विश्व क्षिया क्षेत्रक विश्व मामा केलान हे जार्य मुन्ति प्र महर्मि हिंदी हिंदी है क्रांत कार रेका है मार्ग के क्षांत (sury 23 7 21 25 2122) CEURS (2MR) SAR TO! ONE MANANO 3 स्मिन्न क्या दिन्न अभाव क्षेत्र कारा हिन क्षेत्र कार्य अपने वर्ष कार्य हिन हिन क्षेत्र ह

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