rise to replace maternal vitamin A lost daily in breast milk and to maintain breast milk vitamin A at a level to protect the needs of rapidly growing infants during at least the first 6 months of life[1]"(http://www.who.int/reproductive-health/docs/vitamina4p.pdf). Many women and girls in Bangladesh suffer from chronic Vitamin A deficiency. A diet deficient in Vitamin A before and during pregnancy may result in preterm birth, growth failure or low birth weight in addition to the child being born with an increased risk of vitamin A deficiency. Since there is no recommended dose for Vitamin A supplementation during pregnancy in Bangladesh, women and girls should frequently consume vitamin A rich foods such as green leafy vegetables, yellow /orange and red coloured fruits, fish, eggs, milk, dairy products, liver and meat during pregnancy to avoid Vitamin A deficiency.

Mothers during Post-Partum Period:

While lactating, mothers have an increased demand for Vitamin A. In order to replenish the depleted stores of Vitamin A, mothers during post partum should receive one red coloured high potency Vitamin A capsule (200,000 i.u) within six weeks of delivery. A mother should not be provided Vitamin A Supplementation more than six weeks after delivery because of the risk of toxicity to the newly conceived baby if the mother has become pregnant again during that period.

The mothers should frequently consume Vitamin A rich foods such as green leafy vegetables, yellow /orange and red coloured fruits, fish, eggs, milk, dairy products, liver and meat while breastfeeding. The lactating mother as well as the growing infant will be greatly benefited if the mother consumes Vitamin A rich food.

Fortification:

Food fortified with Vitamin A is a feasible and cost effective approach to reduce VAD. Many countries have already fortified food with Vitamin A (e.g. sugar in Guatemala, milk in UK, vegetable oil in Bolivia, and margarine in Denmark). Bangladesh has also successfully piloted edible oil fortification with Vitamin A. Globally there is a growing interest for food fortification and foods fortified with Vitamin A can be important sources of dietary Vitamin A, particularly for women/girls, and children who partake of the family meals.

[1] Underwood BA. Maternal vitamin A status and its importance in infancy and early childhood. Am J Clin Nutr 1994; 59(suppl):517S.524S

Dietary Improvement (through Dietary Diversification and Nutrition Education):

According to National Nutrition Survey 1995-96, 43% rural, 50% urban and overall 44% of the entire population have been able to meet their requirements of Vitamin A through diet. Retinol is usually found in liver, eggs, meat, and fish. However, the consumption of this type of expensive foods is economically not feasible for most families. Naturally plant sources are the primary source of vitamin A. In the body, beta-carotene from plant sources is converted to Vitamin A. In order that the body can effectively absorb the beta-carotene found in green leafy and yellow-orange coloured vegetables, edible oil or fat is required in cooking. In Bangladesh, oil is used sparingly in cooking, and total oil and fat intake is low (15gm/capita/day) and the consumption of vegetables is only 50-70 gm/head/day as against the recommended intake of 200 g/head/day (Hortex Foundation).

Conclusion:

It is generally accepted that supplementation with VACs is the most cost effective but short-term measure. Fortification is a medium-long term measure. It requires a centralised food industry and effective surveillance systems that conducts effective fortification quality control and measures its biological impact. The longer term approach, dietary diversification, is initially labour intensive and has limited population coverage. Therefore all efforts should include a combination of supplementation, fortification as well as dietary diversification to save the lives of the children.

Courtesy: Micronutrient Initiative

This work has been published with support from the Micronutrient Initiative, Ottawa, Canada through the financial assistance of the Government of Canada through the Canadian International Development Agency (CIDA).

NATIONAL GUIDELINES FOR VITAMIN A PROGRAM IN BANGLADESH

INSTITUTE OF PUBLIC HEALTH NUTRITION (IPHN)
DIRECTORATE GENERAL OF HEALTH SERVICES
MINISTRY OF HEALTH AND FAMILY WELFARE
GOVERNMENT OF BANGLADESH

AUGUST 2008

Introduction:

Vitamin A plays an important role in child development and increases resistance to infection. Infant Mortality Rates (0-12 months)(52/1000 live births) and Under 5 Mortality Rates (0-59 months)(65/1000 live births) are unacceptably high in Bangladesh (BDHS 2007). Studies (Beaton et al) reveal that in populations where Vitamin A deficiency is endemic, like in our country, a 23-34% reduction in mortality is expected when Vitamin A status is raised to normal values.

VAD is now recognized as one of the most common and devastating health problems, compromising immune systems, leading to about 1 million child deaths every year (Global Progress Report on Mineral and Vitamin Deficiency) and is the leading preventable cause of blindness. The Millennium Development Goal (MDG) 4 deals with reduction of child mortality. It is well established that Vitamin A deficiency (VAD) control is one of the most effective means of improving child survival. Vitamin A supplementation holds tremendous potential as a public health intervention and has been identified as an effective child survival strategy to reduce the incidence of diarrhea and the severity of measles. VAD is one of the major nutritional problems in Bangladesh (Sommer et al).

Vitamin A Supplementation:

Children less than year of age:

VAD develops in children basically because of three reasons:

1) their mothers are vitamin A deficient during pregnancy and lactation and produce breast milk with lower concentrations of preformed vitamin A;
2) during weaning breast milk is replaced with diets that are poor sources of vitamin A; and,
3) in poor developing countries, infants and young children spend significant periods of time being sick, when decreased appetite and food intake, malabsorption, parasitic infestations and increased catabolism deteriorate their vitamin A status even further.

Therefore colostrums, which contain high concentrations of Vitamin A, should be given to all new borns immediately after birth. Infants should be exclusively breastfed for the first six months (180 days) of life to achieve optimal health. The rates of giving colostrums and exclusive breastfeeding till six months of age have increased to 87% and 42% (BDHS 2004), respectively, but need further improvement as 50% of Bangladeshi infants still die during the first week of life. After six months, to meet their evolving nutritional requirements, infants should be fed nutritionally adequate and safe complementary foods and continue breastfeeding up to two years of age. The blue coloured Vitamin A capsule (100,000 i.u) is administered at 36 weeks along with the measles vaccine at health/vaccination centres.

Age	Dose	Frequency
36 weeks	100,000 i.u (Blue colour)	Once with Measles vaccine

Infants born with low vitamin A stores are more prone to get infections. Infants at six months of age should be given micronutrient-rich foods, such as green leafy vegetables, yellow/orange/red colored fruits, fish, eggs, dairy products, liver and meat.

Children 12-59 months of age:

High potency Vitamin A capsules (200,000 i.u) are provided to all children twice a year. The red coloured VACs are supplemented by health workers and volunteers through health/vaccination centers across the country once in April/May and another in November/December. The VACs are provided once during National Immunization Days (NIDs) and during stand alone National Vitamin A Plus Campaigns (NVAC)s.

Age	Dose	Frequency
12-59 months	200,000 i.u (Red colour)	Every six months

Children with specific medical conditions:

Children in Bangladesh commonly suffer from infectious diseases leading to an increased need for vitamin A. This is particularly true for children with persistent diarrhea (>14 days duration) and measles. There is growing evidence that improved vitamin A status reduces the duration, severity and complications of measles and diarrhea. Severely malnourished children are typically deficient in Vitamin A as well. All these children require vitamin A supplementation.

International guidelines recommend the following VAS schemes for children with specific medical conditions:

Recommended doses for Vitamin A capsule supplementation for treatment of children with specific medical conditions

Medical condition	Dose			Dose schedule
	Age< 6 Months	Age 6-11 Months	Age > 12 Months	
Night Blindness Bitot's Spots Xeropthalmia	50,000 i.u	100,000 i.u	200,000 i.u	1st Day 2nd Day 14th Day
Measles	50,000 i.u	100,000 i.u	200,000 i.u	1st Day 2nd Day
Persistent Diarrhoea Post-measles pneumonia Severe Malnutrition	50,000 i.u	100,000 i.u	200,000 i.u	Single Dose

★ If a child with persistent diarrhea, Post-measles pneumonia or severe malnutrition has received prophylactic Vitamin A during the previous four weeks, additional Vitamin A should not be given. However, children with symptoms of Vitamin A deficiency (Night Blindness, Bitot's Spots or Xeropthalmia) and children with measles should receive additional Vitamin A as recommended, regardless of the previous history of Vitamin A Supplementation.

● Diarrhea is considered to be persistent if it lasts longer than two weeks.

Women/Girls during Pregnancy:

"The increased need for vitamin A during gestation is small and can be provided through a balanced diet and maternal reserves from well-nourished women.1 In areas of endemic vitamin A deficiency (VAD), however, vitamin A supplements often must supply this need. With lactation, requirements