Nutrition and Health: Strategies for Eliminating Vitamin A Deficiency (VAD) in Tanzania

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Presentation Outline

- Introduction
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- Vitamin A Deficiency(VAD)
- Causes of VAD
- Dietary sources of vitamin A
- VAD intervention strategies
- Role of OFSP in preventing VAD
- Nutritional challenges of OFSP
- How best to measure vitamin A
- Conclusion

Nutritional Situation in Tanzania (TDHS 2010)

Children <5 years	%	Women 15-49	%
Stunting	42	Low Body Mass Index	11
Underweight	16	Iodine Deficiency	36
Wasting	5	Anaemia	40
Anaemia	69	Iron deficiency	30
Iron Deficiency	35	Vitamin A deficiency	37
Vitamin A Deficiency	33		

Vitamin A Deficiency(VAD)

- VAD continue to be a significant public health nutrition problem in Tanzania.
- Children under the age of five years and pregnant women are most at risk because of their high dietary requirement.
- According to the World Health Organization (WHO), serum retinol concentrations are classified as normal, marginal, and deficient, ≥0.70 µmol/L, 0.35-0.70 µmol/L, and <0.35 µmol/L, respectively(WHO/UNİCEF/USAID/Helen Keller International IVAGC Meeting 1982)

What are the causes of VAD ?

Immediate 2. Underlying and 3. Basic causes

Immediate causes

- Low vitamin A and fat dietary intake
- High incidences of infections such as diarrhea, measles and malaria
- Low birth weight
- Maternal deficiency of Vit. A
- Breast feeding of short duration and non-exclusive in the first six months
- Inadequate complementary diet and feeding practices

What are the causes of VAD among young children? Cont……

Underlying causes

- Poor health infrastructure for services or programmes
- Low production of vit. A rich foods
- Poor marketing /distribution/storage/preservation of vit A rich foods
- Inadequate caring capacity
- Maternal awareness/education/literacy

What are the causes of VAD among young children? Cont……

Basic causes

- Poverty with early childhood deprivation
- Poor economic or physical access to markets
- Diseases
- Food availability
- Environmental conditions
- Cultural considerations
- Status of women
- Political system

Dietary sources of vitamin A

The dietary sources of vitamin A are :-

- Preformed vitamin A (commonly found in foods of animal origin) and
- Provitamin A carotenoids (found in yellow and orange-fleshed fruit and vegetables and in dark-green leafy vegetables).

VAD Intervention strategies in Tanzania

Five strategies to overcome micronutrient deficiencies:

- **Supplementation** – Targeting children under-fives, pregnant and lactating women
- **Food fortification** – adding micronutrients to commonly eaten foods
- **Selective breeding and bio-fortification**
- **Dietary diversification** - Dietary diversification includes the production of β-carotene–rich crops, such as orange-fleshed sweet potato (OFSP).
- **Public health programs** – eg immunization, deworming, sanitation(WASH) to reduce infections which reduce absorption and increase micronutrient needs

The role of OFSP in prevention and control of VAD

- OFSPs, which are naturally rich in β-carotene, are an excellent food source of provitamin A.
- The consumption of OFSP increased vitamin A intake (Hagenimana et al., 1999) and control VAD (Low et al., 2001).
- Consumption of meals containing β-carotene–rich sweet potato increased serum retinol concentrations in marginally vitamin A–deficient children (Jalal et al., 1998).

Benefits of OFSP

- Increased dietary vitamin A intake
- Improved Household Food and Nutrition Security
- Improved Household Income generation

Nutritional Challenges related to OFSP

- Concerns about heartburn and
- Flatulence
- Seasonality
- Limited storability
- Risk of marketing compromising nutrition

How best to measure public health impact of vitamin A programmes? Methodological challenges

- Vitamin A is stored primarily in the liver, and thus liver vitamin A concentration is considered to be the best indicator of vitamin A status.
- However, because obtaining liver specimens is difficult and usually not justified, indirect assessment techniques such as serum retinol concentration and the relative dose response tests are commonly used to assess vitamin A status.
- Retinol is not an optimal indicator

How best to measure impact of vitamin A programmes? methodological challenges cont…….

- Another indirect assessment method is the stable isotope dilution technique, which provides a quantitative estimate of the size of the exchangeable body pool of vitamin A.
- The stable isotope dilution technique has the advantage that it is the only indirect assessment method that provides a quantitative estimate of vitamin A status across the continuum of status, from deficient to excessive vitamin A pool sizes.

Conclusion

- Promotion of the production and consumption of β-carotene-rich food is a sustainable approach to combat vitamin A deficiency. The strategy will complement other vitamin A intervention programmes such as supplementation and fortification.

Thank you for your attention