Republic of Yemen
Ministry of public Health and Population
Primary Health Care

National Nutrition Strategy for Yemen (Draft)

Contents

1. Background:

Nearly 50 percent of the population is below 15 and total fertility rates remain among the highest in the world. Yemen's GNI per capita stood at about US$770 in 2006 and about 35 percent of the population is poor[1)]. Child (<5 years) mortality and maternal mortality in Yemen are highest among the Middle East countries, being 100 per 1000 live births and 370 per 100,000 live births, respectively[2)]. In addition, 53.1% of children under five are suffering from stunting, 12.4% are wasting and 45.6% are of underweight[3)]. These values are even higher than the average of all the developing counties. Many children are also suffering from micronutrient deficiencies such as iron deficiency anaemia, iodine deficiency disorders, rickets and vitamin A deficiency[4)]. Furthermore, 25% of women are estimated to be malnourished from the previous reports based on body mass index[5)], indicating that many women are under chronic energy deficiency. Women at child bearing age are also suffering from anemia[4)]. This is recognized as one of the very serious problems occurring in nation wide.

Malnutrition places enormous burden on vulnerable groups, in particular children and women who live in the condition under poor socio-economic status. Even mildly or moderately malnourished children and women are more likely to be at high risk of death due to lack of resistance against common infectious diseases. It has been clearly demonstrated that malnutrition is an underline cause of high mortality and that malnutrition (indicated as underweight) is ranked as the most important factor among preventable factors affecting people's healthy life.

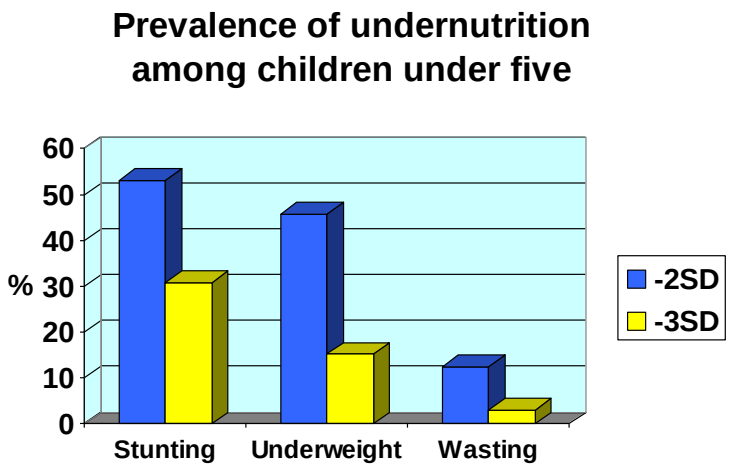
The above types of malnutrition not only affect people's health but also affect the quality of life and the development of the socio-economic situation in the way of vicious circle.

Considering these situations, the Government of Yemen has put the higher

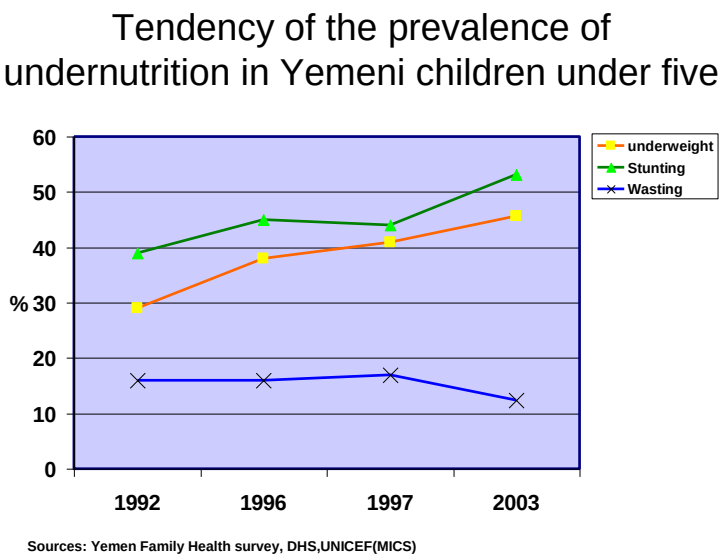
2. Nutritional Situation in Yemen

2-2. Nutritional situation and trends

Child undernutrition



Source: Yemen Family Health Survey 2005



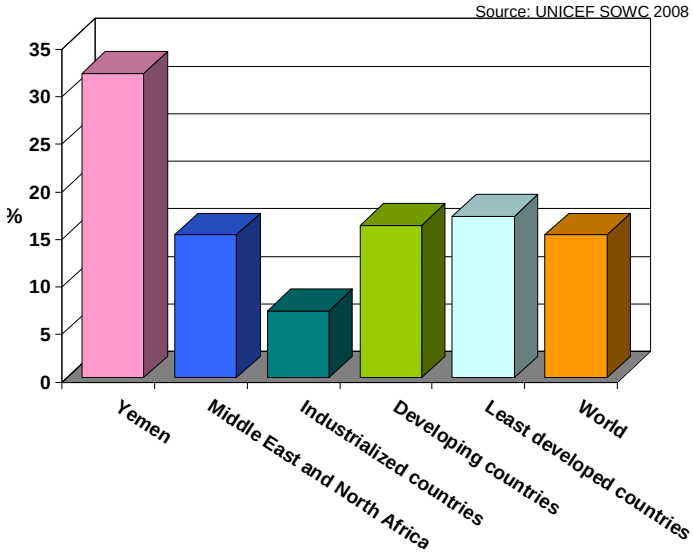
Sources: Yemen Family Health survey, DHS,UNICEF(MICS)

- More than 50 % of children under five are suffering from moderate or severe stunting and 30 % of them are severe stunting according to the data of YFHS 2005.
- About 45% of children are affected by underweight and 10% of them are wasting.
- The prevalence of stunting and underweight are higher than the averages of least developing countries, showing the highest in the Middle East countries.
- The situation of undernutrition among children under five has not been improved in the last decade.

LBW

Prevalence of Low Birth Weight (1999-2006)

Source: UNICEF SOWC 2008



- According to the study conducted by Makki AM, targeting for newborn babies and mothers admitted at four hospitals in Sana'a, the mean birth weight of the newborns was 2812g. 22 % of them weighed between 700 and 2499g. (Makki AM: Risk factors for low birth weight in Sana'a City, Yemen, Ann Saudi Med. 2002 Sep-Nov; 22(5-6): 333-5.

breastfeeding

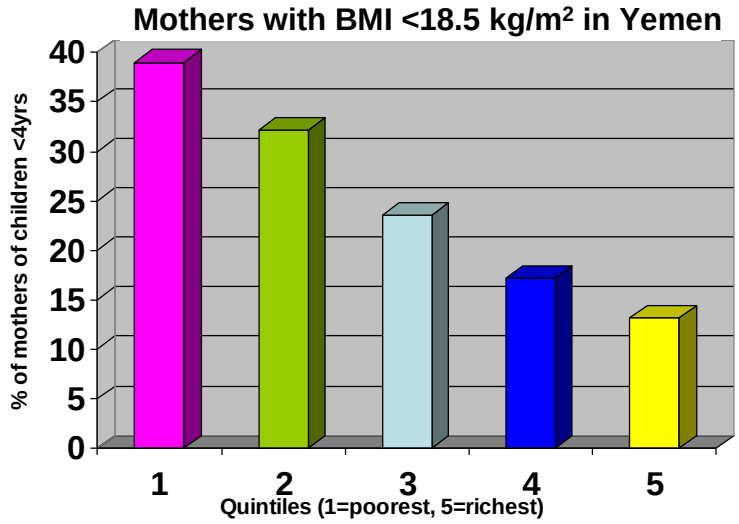
Breastfeeding and complementary feeding in children under 3 years

Age in months	No breast feeding (%)	Exclusive breast feeding (%)	Breastfed with (%)			% use feeding bottle	Infants' Number
			Water	Water, Juice, Liquids	Comple-mentary food/milk		
0 -3	3.6	16.0	23.4	3.4	50.7	41.7	819
4-5	7.7	3.7	13.6	1.7	70.7	52.7	470
6-9	11.1	1.7	8.6	0.7	76.3	51.4	942
10-11	18.6	0.6	3.5	0.6	74.4	54.9	325
12-23	35.8	0.7	2.7	0.4	59.4	48.9	2058
24-35	68.6	0.2	0.5	0.0	24.6	42.7	1294
Total	31.4	3.1	7.0	0.9	55.0	47.6	5909

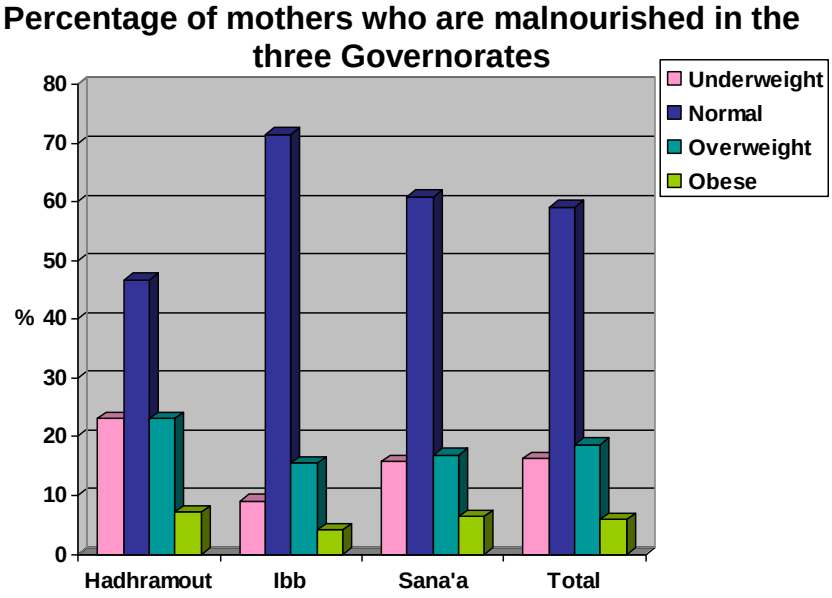
Source: Yemen Family Health Survey, 2005

- The coverage of exclusive breastfeeding is very low in Yemen. The data shows that the percentage of children <6 months who are exclusive breastfeeding is only 12%. This figure is quite low compared with that of the other developing countries.

Maternal undernutrition



Source: Nandini Ooman et al. Inequalities in Health, Nutrition and Population; Yemen, World Bank, 2003

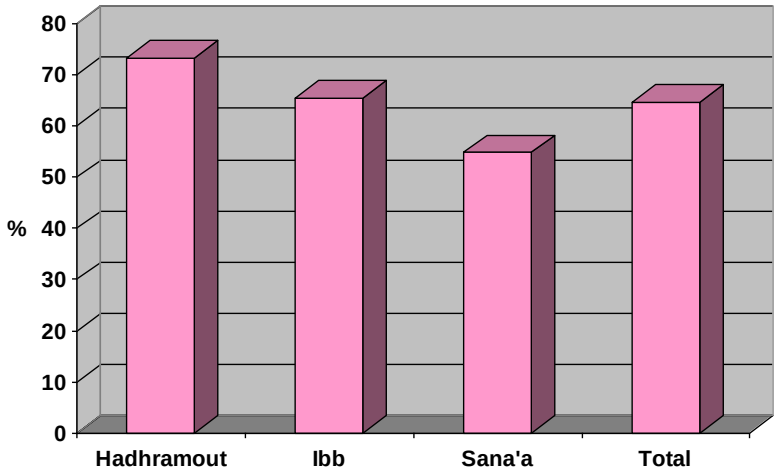


Source: Data of the survey conducted by Nutrition Department, MOPHP, and JICA, 2008

- According to the data of YDMCH survey 1977, about 25% of Yemeni women at the age of 15 to 49 years were estimated to be malnourished.
- The repot of Nandini Ooman et al demonstrated that the women of poor economic groups have higher risk of malnourishment.
- The data of the survey conducted by Nutrition Department, MOPHP, 2007/8 showed that about 15% of mothers in the three Governorates were estimated to be malnourished and women in Hadhramout are likely to be more suffered from malnourishment compared with those of Ibb and Sana'a Governorates.

Anemia

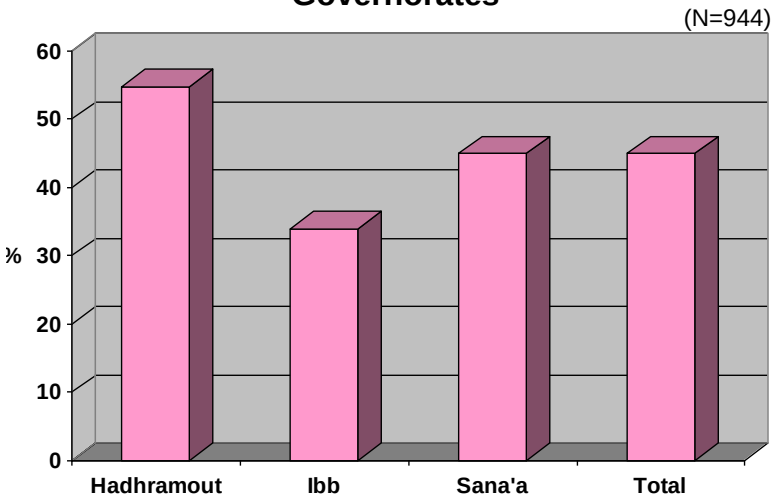
Percentage of children under five who are anemic in the three Governorates



Source: Data of the survey conducted by Nutrition Department, MOPHP, and JICA, 2008

Percentage of mothers who are anemic in the three Governorates

(N=944)

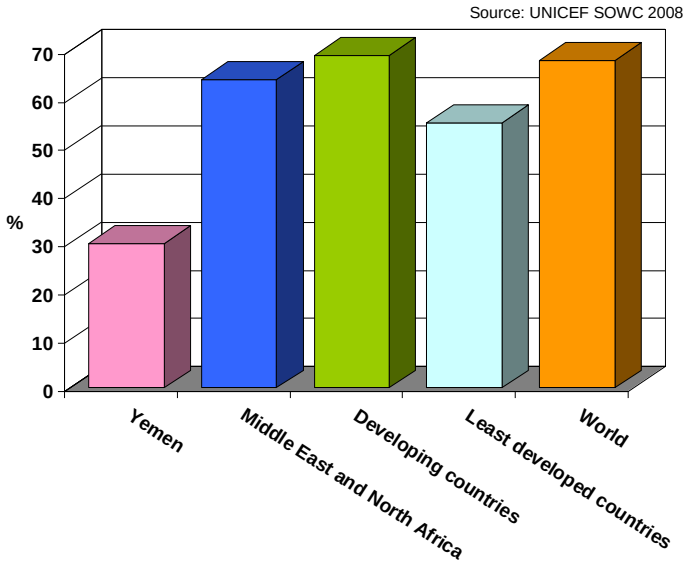


Source: Data of the survey conducted by Nutrition Department, MOPHP, and JICA, 2008

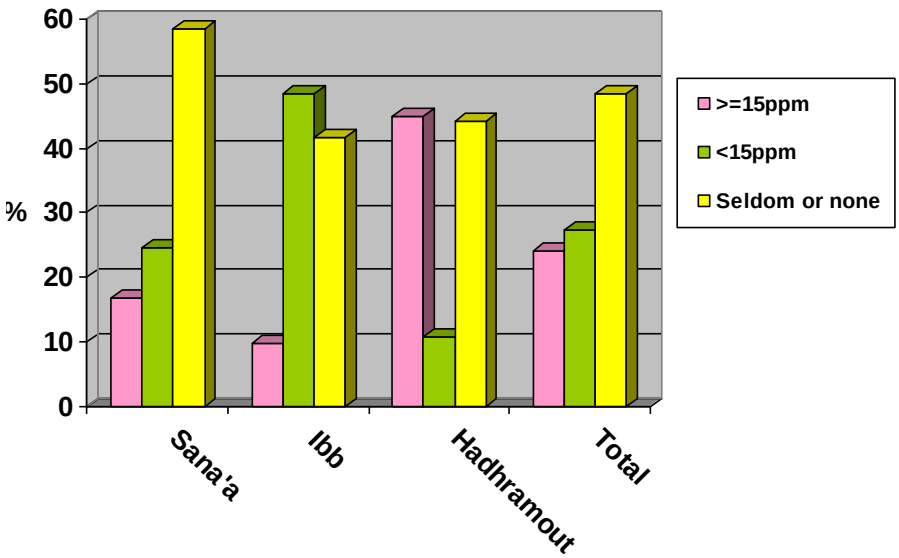
- There have been no national data of anemia prevalence among children and mothers. The data of the survey conducted in the three Governorates showed that about 65% of children under five are anemic, indicating that high percentage of children under five are suffering from anemia.
- The data showed that 45% of mothers are anemic, indicating mothers are under public health problems as well.

IDD prevalence and iodized salt coverage

Percentage of households consuming iodized salt 2000-2006



Percentage of households usisng iodized salt in three Governorates

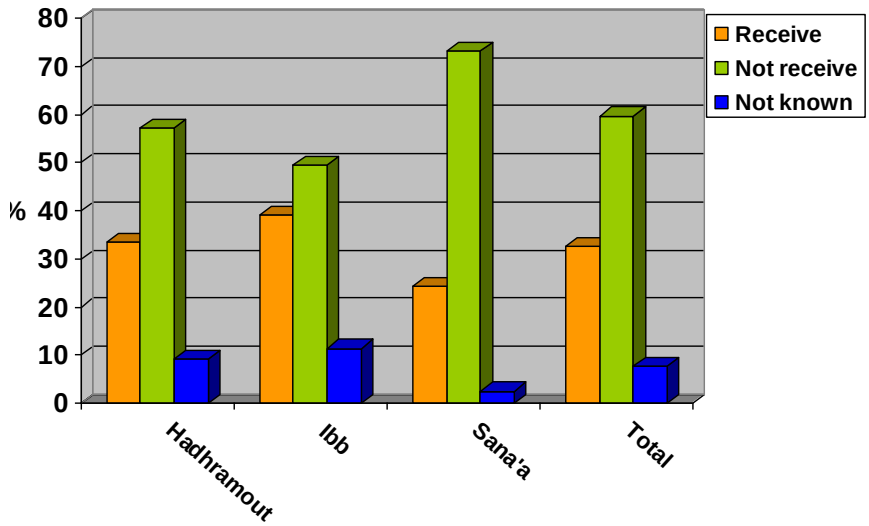


Source: Data of the survey conducted by Nutrition Department and JICA, 2008

- According to the result of YFHS, around 30% of households used the salt containing more than 15ppm and 26% used the salt less than 15ppm, while 41% used non iodized salt.
- The data of the survey by MOPHP showed that round 24% of household used the salt containing more than 15ppm of iodine. This is almost similar to the result of YFHS.
- The rate of households using iodized salt is higher in Hadharamout than in Sana'a and Ibb.

Vitamin A deficiency

Percentage of children under five who ever received vitamin A supplementation in three Governorates



Source: Data of the survey conducted by Nutrition Department, MOPHP, and JICA, 2008

- There has not been reliable and recent data of vitamin A deficiency. However, Rosen DS et. al. had the survey on Vitamin A deficiency in Western Yemen one decade ago and concluded that Xerophthalmia and vitamin A deficiency are public health problem in Yemen. (Rosen DS et al: Vitamin A deficiency and xerophthalmia in western Yemen, EurJ Clin Nutr, 1996 Jan; 50(1): 54-7
- The coverage of vitamin A supplementation is still low in Yemen; The coverage is 15 % in children at the age of 6 to 59 months old (UNICEF 2008).
- The data of the survey for the governorates showed that 32% of children under five ever received vitamin A supplementation.

Rickets

Underwood P and Margetts B had survey on rickets of children in North Yemen. They summarized their survey result as follows:

- *Despit a warm sunny climate, rickets is extremely common in hildren in isolated mountainous area of North Yemen. In a small township the overall prevalence amongst children under five years attending for vaccination was 27%.*
- *The condition was most common at the end of the first year and had disappeared by the fifth year. Marasmus was commonly associated with ricket. Children from the rural villages outside the township had constribute to the very high rates of rickets.*
- *Several factors may contribute to the very high rates of rickets in rural Yemen. However, lack of exposure to sunlight as a consequence of particular cultural practices is likely to be the most important.*
- *The major social and behavioural factors which restrict the young children access to sunlight are outlined, and possible remedies discussed.*

Source: Underwood P and Margetts B., High levels of childhood rickets in rural North Yemen. Soc Sci Med. 1987; 24(1)

The data of the survey of Nutrition department, MOPHP, showed that 56% of children under five in Ibb area had some symptoms of rickets. This percentage is unexpectedly high. However, this result indicates that there is possibility of high prevalence of rickets in Yemen and further studies must be necessary to clarify the situation.

School Nutrition	▪ According to the result of the survey which was conducted by Raja'a YA et. al., targeting for the school children in Sahar District, stunting was found in 50.9%, wasting in 4.5% and underweight in 48.7% of the children examined. (Raja'a YA, Mubarak JS; Intestinal parasitosis and nutritional status in school children of Sahar district, Yemen. East Mediterr Health J. 2006; 12 Supple 2:S189-94.

Household food security

The situation of household food security in Yemen

	Households not Classified as Vulnerable	Households Classified as Food Insecure or Vulnerable		
		Vulnerable	Food Insecure Households	
			Food Insecure with Moderate Hunger	Food Insecure with Severe Hunger
All Households	57.6 %	20.8 %	13..8 %	7.9 %
Households Size				
1-3 Members	62.4 %	19.5 %	11.5 %	6.5 %
4-6 Members	56.8 %	21.3 %	14.1 %	7.8 %
7-9 Members	56.3 %	21.3 %	14.3 %	8.0 %
10-12 Members	56.7 %	20.5 %	14.4 %	8.5 %
13 + Members	57.6 %	20.0 %	13.7 %	9.1 %
Numbers of Children				
No Children	64.9 %	19.1%	10.9 %	5.1 %
1-2 Children	58.6 %	21.1 %	12.7 %	7.5 %
3-4 Children	54.7 %	21.8 %	14.8 %	8.7 %
5-6 Children	51.6 %	20.8 %	17.4 %	10.1 %
7+ Children	49.2 %	20.4 %	17.9 %	12.5 %
Main Source of Food				
Own production of Food	62.6 %	20.3 %	8.4 %	8.7 %
Agriculture produce	64.1 %	20.2 %	9.8 %	5.9 %
Regular employment	68.8 %	18.0 %	8.9 %	4.3 %
Temporary employment	40.9 %	25.5 %	21.1 %	12.5 %
Commercial activity	81.4 %	13.0 %	4.7 %	0.9 %
Remittances	79.1 %	14.0 %	5.1 %	1.8 %
Others sources	41.7 %	23.5 %	21.5 %	13.3 %
More than one source	66.1 %	18.3 %	10.7 %	4.9 %
Agriculture Status				
Non- Agricultural HH	53.6 %	21.4 %	15.8 %	9.2 %
Agricultural HH	59.3 %	20.5 %	12.9 %	7.3 %

Source: Nader Kabbani and Yassin Wehelie, Survey Results on Hunger and Food Insecure In Yemen, Draft March 9, 2005

- About 40% of households were estimated to be vulnerable or food insecure situation; about 20% are under critical situation of food insecure with moderate hunger or with severe hunger.
- Number of children (sibling) is probably one of important factors for food insecurity.

2-2. Causes and consequences of nutritional problems

Issues	Causes	Consequences
Child undernutrition	• Inappropriate breastfeeding practice • Inappropriate complementary feeding practice • Insufficient food intake quantitatively and qualitatively • Poor household food security • Infectious diseases • Low weight birth.	• Growth failure (underweight, stunted and wasted) • High risk of mortality and morbidity • Depressed learning ability • Low productivity in adulthood
Low birth weight	• Maternal malnourishment • Early and frequent pregnancies • Life habit like smoking and chewing qat during pregnancy • Less access the services of nutrition screening and counseling. • Less access the services of special care for LBW.	• High risk of morbidity and mortality • Increased risk of stunting • Risk of depressed neurodevelopment • Low productivity in adulthood • Increased risk of chronic diseases in adulthood
Maternal undernutrition	• Inadequate dietary intake quantitatively and qualitatively • Less access of nutrition screening and counseling services • Early and frequent pregnancies • Heavy work load • Inappropriate life habit like smoking, chewing qat and using *shamma*.	• High risk of maternal mortality and morbidity • Low productivity • High prevalence of LBW • High risk of neonatal mortality
Anemia	• Inadequate iron intake from daily foods • Low bioavailability of iron in daily foods • Less access of iron/folate supplementation • High prevalence of parasitic infestation	• Reduced learning ability • Low birth weight • High risk of maternal morbidity and mortality • Low productivity • Increased risk of prenatal morbidity and mortality
Iodine deficiency	• Insufficient intake of iodine from daily foods • Inadequate access to iodized salt	• Cretinism • Goiter • Impaired cognitive function • Reduced learning ability • Low productivity • Increased risk of miscarriage

Issues	Causes	Consequences
Vitamin A deficiency	• Insufficient intake of vitamin A from daily foods • Low coverage of vitamin A supplementation	• Night blindness • Xerophthalmia • High risk of morbidity and mortality • Increased risk of anemia
Zinc deficiency	• Insufficient intake of zinc from daily foods • Inhibited or reduced zinc absorption	• Growth failure • High risk of morbidity and mortality • Impaired immune function
Rickets	• Lack of the exposure to sunlight • Insufficient intake of vitamin D in children and pregnant mothers • Failure of early detection for rickets symptoms	• Short stature and skeleton deformity • Low productivity in adulthood • High risk of mortality
Undernutrition in school children	• Insufficient food intake (lack of breakfast and inappropriate lunch) • Infectious diseases • Continuity of undernutrition from childhood	• Reduced learning ability • Impaired endurance performance • Delayed physical growth • High risk of morbidity

3-3. Government actions in nutrition sector

Program	Contents	Collaboration with
Community based nutrition	▪ Growth monitoring ▪ Promotion of breastfeeding ▪ Counseling/education on child and maternal nutrition and health	UNICEF World Bank
Breastfeeding	▪ Counseling for breastfeeding ▪ Preparation of education material ▪ Conducting campaigns of 'World Breastfeeding Week'	WHO UNICEF
Iodine deficiency	▪ Training workers of salt factory ▪ Provide Potassium iodine to salt factory ▪ Improve awareness about the importance of iodized salt ▪ Monitoring and evaluation of salt iodization ▪ Preparation of education material	UNICEF
Vitamin A deficiency	▪ Vitamin A supplementation through measles vaccination activities to children at the age of 9 months old and 1 year and half old ▪ Preparation of education material for the control of vitamin A deficiency ▪ Promote vitamin A fortification to oil and ghee factories according to the legislation	EPI section UNICEF
Anemia	▪ Promotion of iron fortification in wheat flour factories ▪ Training workers of the wheat milling factories ▪ Monitoring the iron fortification at the milling factories ▪ Preparation of education material for the control of iron deficiency anemia	UNICEF
Food aid	▪ Distribute food to pregnant and lactating mothers ▪ Distribute food to malnourished children under 5 years ▪ Training health workers in health centers regarding growth monitoring and health education	WFP
Community Therapeutic Care	▪ Outpatient therapeutic program (Health centers and units) ▪ Establishing therapeutic feeding center	WHO UNICEF
Community nutrition and health for mother and child	▪ Develop system of community health volunteer ▪ Capacity development of community health volunteers ▪ Provide nutrition and health services (nutrition and health education, ORS, Vitamin A supplementation, de-worming tablet, growth monitoring, etc) by community health volunteers	JICA

3. Overall goal

Health status of Yemeni people is improved through strengthening nutritional intervention.

The overall goal is to be reached by the year 2020. In order to reach overall goal, the Government of Yemen have to tackle all kinds of malnutrition and their risk factors through effective and systematical nutrition intervention with well trained health workers and other corporative stakeholders.

Serious nutritional problems to be solved in this moment are malnutrition/undernutrition; including anemia, vitamin A deficiency, iodine deficiency, rickets, zinc deficiency and household insecurity.

Therefore, the Government of Yemen has to conduct the following nutrition interventions:

- **Control of child undernutrition**
- **Control of low birth weight**
- **Control of maternal undernutrition**
- **Control of rickets**
- **Control of iron deficiency anemia**
- **Control of vitamin A deficiency**
- **Control of iodine deficiency**
- **Control of zinc deficiency**
- **School nutrition**
- **Nutrition for emergency situation**

Characteristics of Nutrition Strategy

The development of nutrition strategy is very important and indispensable for the concerned government sectors and partners to address serious nutritional problems which are affecting healthy life and socio-economic activities in Yemeni people. As a result of developing nutrition strategy, the following outputs are expected to be reached.

- To clarify nutritional interventions necessary for Yemeni people
- To clarify the objective, the measures of approaches and the actions of nutritional intervention
- To facilitate conducting the nutritional programs effectively because of making clear on the responsible bodies for each activity
- To facilitate evaluating the outcome of each nutritional program by measuring fixed indicators
- To facilitate sharing common concepts, terms and formats of nutrition intervention among stakeholders

4. Principle of nutrition strategy

Why are the nutrition strategy and interventions very important?

Human right	Hunger and malnutrition are unacceptable in a world that has both the knowledge and the resources to end this human catastrophe. We recognized that access to nutritionally adequate and safe food and services for nutrition education are the rights of each individual. .(World Declaration on Nutrition, Item 1)
Pre-condition for development	We recognize that the nutritional well-being of all people is a pre-condition for the development of societies and that it should be a key objective of progress in human development, It must be at the center of our socio-economic development plans and strategies. (World Declaration on Nutrition, Item 11)
Healthy life	Nutritional disorders are a crucial cause of morbidity and mortality for children and mothers. It has been demonstrated that malnutrition is associated with more than 50% of all death among children (WHO). On the other hand, malnutrition in childhood and long-term practice of unbalanced diet are a great risk factor for chronic diseases such as cardiovascular diseases, cancer and diabetes. Better nutrition is fundament al for healthy life of all the people.
Universal primary education	Undernutrition in infancy and early childhood affects the school enrolment rates and on cognitive and behavioral development. Iodine and iron deficiencies lead to impaired cognitive development and thus effect the educational attainment. Nutrition is therefore one of the key elements for not only normal physical development but also for improved intellectual resources

5. Basic approach of nutrition strategy

What are basic approaches and visions for successfully proceeding nutritional intervention with newly developed strategies?

Considering gender	Pay special attention for the nutrition of women during pregnancy and lactation. Women play a key role in socio-economic development and in may societies they are also the main producers of food. All forms of gender discrimination including traditional practices detrimental to women must be eliminated in accordance with the 1979 Convention on Elimination of All Forms of Discrimination against Women.
Prioritizing vulnerable groups	Keep a high priority to the vulnerable people for the protection and promotion of their nutritional well-being. Infants, young children, pregnant and nursing women, disabled people and the elderly within poor households are the most nutritionally vulnerable groups.
Respecting constitution and legislations	Respect the following constitution and laws: ▪ Breastfeeding promotion and protection decree (Appendix 1) ▪ Flour and oil/ghee fortification decree (Appendix 2) ▪ Salt iodization law (Appendix 3) ▪ Child right law
Coordination among MOPHP sectors	Coordinate and integrate nutrition plans in activities of the relevant health programs such as EPI, IMCI, MCH, Reproductive Health
Coordination among multi-sectoral parties.	Maintain and strengthen coordination among other agencies involved in nutrition activities, i.e. the Ministry of Agriculture, the Ministry of Education, Ministry of Social Development, as well as among other programs of International Donor Agencies, NGOs and private sectors.
Capacity development	Promote the capacity development of all health workers to implement effectively nutritional programs with good skills and appropriate knowledge.
Monitoring and evaluation	Monitor and evaluate the situation of nutritional status and program implementation to strengthen nutrition policy and strategy and to modify programs as necessary.
Community participation	Promote, facilitate and utilize community participation and involvement for all nutrition activities

6. Recommendation for the future actions

Action	Responsibility	Collaboration
Create National Food Composition Table	• MOPHP	• MOA • Yemen Standardization & Specification Authority • University (Faculty of Agriculture)
Conduct National Nutrition Survey	• MOPHP • CSO	• Universities (Faculty of Medicine & Faculty of Agriculture) • International Donors
Strengthen Information System	• MOPHP	• International Donors
Strengthen Research Capacity	• Universities (Faculty of Medicine & Faculty of Agriculture)	• MOPHP • International Donors
Establish Higher Education Institute for Nutrition	• Ministry of Higher Education	• MOPHP • MOA
Expand the existing national food council to be food and nutrition council	• MOPHP • MOA • MO Planning • MO Interior • MO Trade & Industry • YSMO • MOE • MO Higher Education • MO Information	

7. Dietary guideline for Yemeni people

The Dietary Guideline for Yemeni people was developed by MOPHP and improved by the members from the participant of Workshop on "National Nutrition Strategy". This guideline is helpful for health workers and any personnel concerning nutrition and diet to use as a tool of general message to promote good diets and good dietary habits for all the Yemeni people.

Categories	Actions
Practice good dietary intake	▪ Eat balanced diets containing grain products [1] , protein-rich foods[2], vegetable and fruits everyday ▪ Eat fresh vegetables in daily basis ▪ Drink at least 6-8 cups of water everyday
Keep good food habits	▪ Have enough time for your meals and enjoy taste of foods ▪ Eat three meals regularly ▪ If you like tea, drink it at least one hour after your meal
Prevent malnutrition	▪ Take care of children and pregnant and lactating mothers to feed nutritious foods[3] ▪ Eat iron rich foods[4] and its enhancers [5] ▪ Avoid over eating and under eating to maintain proper body weight[6] ▪ Encourage exclusive breastfeeding[7] for the first 6 months and sustaining breastfeeding up to at least 2 years with proper complementary food[8] ▪ Use iodized salt[9] ▪ Eat dairy foods frequently and do not avoid to exposure sunshine for young children
Prevent food born diseases	▪ Drink clean water ▪ Wash hands with clean water before and after eating foods ▪ Prepare meals in hygienic manner
Keep better life style	▪ Quit smoking and chewing qat and use the money for foods ▪ Practice exercise at least 30 minutes everyday

Note

1) **Grain products**: bread (hobus), rice, porridge and foods cooked or processed using wheat, rice, maize, millet, sorghum, etc
2) **Protein-rich foods**: meat, fish, egg, milk products, beans
3) **Nutritious foods**: foods containing a lot of protein, vitamins and minerals such as protein-rich foods, green leaf vegetables and fruits
4) **Iron rich foods**: liver, red meat, fish, dark green leaf vegetables
5) **Enhancers**: nutrients which promote iron absorption such as vitamin C and animal protein. Enhancers are contained in meat, fish, fruits (orange, lemon), and vegetables (tomato, pepper and pumpkin), etc.
6) **Proper body weight**: Body mass index (BMI) should be range from 18.5 to 24.9.
   Ideal weight=BMI x (height in meter)^2.
7) **Exclusive breastfeeding**: feeding only breast milk but not any foods and water
8) **Proper complementary food:** refer to WHO guideline of complementary feeding (Appendix 4)
9) **Iodized salt**: salt containing more than 40ppm of iodine at factory level and more than 15ppm of iodine at household level

Strategy of each nutritional intervention

1. Control of child undernutrition

Objective	Reduce of the prevalence rate of undernutrition among infant and young children
Target	To reduce the prevalence of undernutrition among children under five to half of the current level by the year 2020
Justification for target	Following MDGS target

Strategic objective	Strategic approaches	Activities	Responsibilities	Indicators
Improve infant and young child feeding	Promote and protect breast feeding for infants and young children [1, 2)] a) Promote exclusive BF for the first 6 months timely and BF for at least 2 years with complementary food	▪ Campaign through mass media ▪ Education and counseling mothers regarding BF	Nut Dpt. IMCI Health Education Center GHO &DHO	% of infant of 0-6months with exclusive breastfeeding Prevalence of under-nutrition (underweight, stunting, wasting) in <5 children
	b) Protect from commercial promotional practices undermining optimal BF practices	▪ Implement the prime minister decree on regulation of BF promotion and protection ▪ Appoint inspectors for monitoring ▪ Monitor commercial promotional practice by inspectors	Nut. Dpt. Health Unit Hospitals Family Health Drct. GHO &DHO	
	c) Develop the system of breastfeeding promotion at birth facilities	▪ Assessment of candidate hospitals ▪ Profile necessary support and supplies ▪ Increase awareness for director of hospitals and head of section to promote BF ▪ Training doctors and nurses of selected hospitals	Nut Dpt Reproductive Health Dpt GHO &DHO	

		▪ Implement monitoring and evaluation		
	Promote appropriate complementary food with locally available [3)]	▪ Implement education and counseling for mothers at health facility and community levels*	Nut Dept GHO &DHO	
	Strengthen support from families, communities and health care systems for lactating mothers[4)]	▪ Mobilize mothers group ▪ Advocate community people ▪ Advocate community and religious leaders		
	Improve working environment for lactating mothers[5)]	▪ Update a law of working environment for pregnant and lactating mothers (crèches, BF break, maternity leave and paternity leave) ▪ Campaign for the improvement of working environment	Ministry of Civil Work MOPHP	
	Capacity development at health facility and community levels	▪ Prepare training ▪ Prepare education material ▪ Prepare the guideline of infant and young child feeding	Nut Dept IMCI National Health Education Center GHO &DHO	
Improve dietary habit affecting nutritional status of infant and children	Identify nutritional problems due to culturally related dietary habits	▪ Conduct KAP study ▪ Conduct campaigns to improve nutritional habits	Nut Dept	% of children (2 - 5 yrs) who keep the recommendation of the dietary guideline
	Increase the awareness and knowledge of balanced diets, nutritious foods and good dietary habit	▪ Conduct campaign to good dietary habit ▪ Disseminate the existing dietary guideline through health facilities	Nut Dept	
Contribute improving household food security	Enhancing collaboration with agriculture and other relevant sectors to promote or improve household food security	▪ Establish the taskforce or committee to develop a road map for household food security ▪ Conduct the activities to promote the following issues: a) Food production at household level	MOA Nut Dept	% of households with the luck of food

		b) Food storage and preservation skills c) Utilization of various foods d) Income generation for purchasing foods		
Reduce the risk of infectious diseases	Improve knowledge, skill and practice of hygiene	▪ National campaign through mass media ▪ Education on health and hygiene at health facility and community levels	MOPHP Related sections	Incidence of infectious diseases (diarrhea, ARI, measles, vector born diseases)
	Improve safe water supply, sanitation and housing	▪ Collaboration with the sector of water supply, sanitation and housing	Related sectors in corporation with MOPHP	
	Increase the access to health services	▪ Immunization services ▪ Infectious diseases (measles, Diarrhea, ARI, HIV, Vector born diseases) control ▪ Provision of ORS ▪ Vitamin A supplementation	PHC sectors GHO &DHO	
Reduce the prevalence of LBW	See the strategic approach of LBW control			Prevalence of LBW
Prevent the deterioration of malnutrition cases at early stage	Strengthen growth monitoring activities including nutrition counseling at the all health facilities and at community level	• Develop guideline of monitoring and counseling • Develop training material • Develop manual for growth monitoring and nutrition counseling • Conduct training for healthy worker and health volunteers • Conduct monitoring and evaluation	Nut Dept IMCI GHO &DHO	% of under five children with severe malnutrition

	Improve the capability of treatment for moderate and severe malnutrition cases at health and medical facilities	• Conduct training health workers for treatment of moderate malnutrition • Conduct training medical doctors for the treatment of severe malnutrition • Establish monitoring, and recording system for treatment for severe malnutrition • Integrate the protocols of management of malnutrition with the curricula of medical schools	Nut Dept IMCI GHO &DHO	

Note:

1) Ensure early initiation of BF within one hour, avoidance of pre-lacteal feeding and promote of exclusive BF for the first 6 months.
2) Ensure continuation of BF at least 2 years and introduction of appropriate complementary foods after 6 months.
3) Complementary food should be introduced timely when the need for energy and nutrients exceeds what can be provided through exclusive and frequent breastfeeding. They provide sufficient energy and nutrients to meet a growing child's nutritional needs. They are hygienically stored and prepared, and fed with clean hands using clean utensils and not bottles and teats. They are given consistent with a child's signals of appetite and satiety, and treat meal frequency and feeding method – actively encouraging the child, even during illness, to consume sufficient food using fingers, spoon or self-feeding are suitable for age.
4) Have access to skilled practical help from trained health workers, lay and peer counselors, and certified lactation consultants, who can help to build mothers' confidences, improve feeding technique, and prevent or resolve breastfeeding problems
5) Women in paid employment can be helped to continue breastfeeding by being provided with minimum enabling conditions, for example paid maternity leave, part-time work arrangements, on-site crèches, facilities for expressing and storing breast milk and breastfeeding breaks.

Source: WHO IYCF

2. Control of low birth weight

Objective	Reduce the prevalence of low birth weight
Target	Reduce the prevalence of LBW to less than 15% by the year of 2020
Justification for target	Following the average prevalence of LBW among the middle east and north Africans countries

Strategic objective	Strategic approaches	Activities	Responsibilities	Indicators
Reduce the prevalence of malnourished pregnant women	Create awareness of the importance of additional dietary intake and nutritious foods during pregnancy.	▪ National campaign through mass media ▪ Nutrition education at health facility and community levels ▪ Provide education material ▪ Train health workers and volunteers	Nutrition Dept Reproductive Health Dept Health Education Center	% of pregnant women with adequate body weight gain Prevalence of anemia among pregnant women
	Promote community and family supports for maintaining a good care and dietary habit	▪ Educate community people by health workers and volunteers, with involvement of religious leaders.	Nutrition Dept Reproductive Health Dept NGOs Local authority	
	Ensure iron supplementation for pregnant women	▪ Review the guideline of reproductive health for iron/folic supplementation ▪ Train health workers and volunteers for distribution of iron/folate tablets ▪ Activate the role of health facilities for distribution of the iron/folate tablets ▪ Involve health volunteers for the distribution ▪ Strengthen logistic system and monitoring for delivery of iron/folate tablets	Reproductive Health Dept Nutrition Dept	

Reduce cases of early and frequent pregnancies	Promote the service provision of reproductive health	• Implementation by Reproductive Health Sector	Repro Health Dpt NGOs	Average age of first pregnancy Frequency of pregnancy
Reduce number of pregnant women having habit of smoking cigarette /shisha and chewing qat	Promote social mobilization to aware of the importance of stopping smoking and chewing qat	• National campaign through mass media • Educate community people, with the involvement of religious leaders	Population Sector Family Health NGOs	% of pregnant women smoking and chewing qat
Improve the services of nutrition screening and counseling for pregnant women	Promote the screening system of nutritional status during pregnancy	• Review the guideline of screening and counseling for maternal malnutrition	Neonatal and women health care Dept Nutrition Dept	% of pregnant women accessing the services of nutrition screening and counseling
	Strengthen the capacity of health workers in screening and counseling for maternal malnutrition	• Develop the education manual for screening and counseling for health workers • Train health workers	Neonatal and women health care Dept Nutrition Dept Reproductive Health Dept	
		• Provide the service of the screening and counseling at health facilities	Governorate & district Health Office Hospital Health Center Health Unit	
Increase the access rate of monitoring and providing special care for low-birth weight babies	Strengthen the service provision of monitor and special care for low birth-weight babies	• Develop a manual of special care for LWB baby • Implement regular growth monitoring and counseling at health facilities and at communities • Encourage mothers with LBW baby to access the services of growth monitoring and counseling	IMCI Nutrition Dept Governorate & district Health Office Health center Health U (HW, Vltr) Local authority	% of LBW babies receiving monitoring and special care services

3. Control of maternal undernutrition

Objective	Reduce the prevalence of undernutrition among women of reproductive age
Target	Reduce the prevalence of undernutrition (BMI) of women to 15% by the year 2020
Justification for target	Following the average prevalence of low BMI in the women categorized as the second upper economic group among 5 different economic groups (see chapter 2, Maternal undernutrition)

Strategic objective	Strategic approaches	Activities	Responsibilities	Indicators
Improve dietary diversity and modification for pregnant and lactating mothers	Create awareness of the importance of additional dietary intake and nutritious foods during pregnant and lactating period	▪ National campaign through mass media ▪ Train health workers and volunteers ▪ Nutrition education and counseling at health facility and community levels	Nut Dept Reprod. Health Dept. Health Education Center Midwife Dept. GHO &DHO	
	Promote community and family supports for maintaining a good health care and dietary habit			
Detect under-nutrition of pregnant mothers at early stage and provide appropriate counseling	Promote the screening system of nutritional status during pregnancy	• Review the guideline of screening and counseling for maternal malnutrition	Nutrition Dept Reprod. Health Dept Health Education Center Midwife Dept.	Detection rate of undernourished mothers at early stage % of mothers accessing services of counseling
	Strengthen the capacity of health workers in screening and counseling for maternal malnutrition	• Develop the education manual for screening and counseling for health workers • Train health workers*	Nutrition Dept Reprod. Health Dept Health Education Center Midwife Dept. * Governorate and District levels	
		• Provide the service of the screening and counseling at health facilities	Health workers Midwifes	
Prevent early pregnancy and frequent pregnancy	Promote the service provision of reproductive health	• Implementation by Reproductive Health Sector	Reprod. Health Sector	% of teenagers pregnancy The average of

				birth space
Improve the life custom of women which can be a risk factor of maternal health and nutrition such as heavy work load, smoking and chewing qat	Promote social mobilization to aware of the importance of reducing heavy work load and stopping smoking and chewing qat	• National campaign through mass media • Educate community people, with involvement of religious leaders	Health Education Center Nutrition Dept. Health workers Midwifes Volunteers	% of pregnant and lactating mothers who have a custom of smoking or chewing qat

4. Control of rickets

Objective:	Eliminate the prevalence of rickets among children under five
Target	Eliminate the case of rickets among children under five by 2020
Justification for target	This nutritional disorder is no more common in the world

Strategic objectives	Strategic approaches	Activities	responsibilities	Indicators
Increase the rate of children exposured to sunlight for children and pregnant mother	Create the awareness of the importance of appropriate exposure to sunlight	• conduct nationwide education activities	Nutrition Dept Health Education Center	% of children exposured to sunlight
Increase the consumption of foods rich with vitamin D and calcium in children and pregnant mothers	Create the awareness of the importance of the consumption of VD/Ca rich foods Aware the community on correct practices of food habits Promote the implementation of prime minister decrees on regulation of BF protection and oil and ghee fortification	• Train health workers and volunteers how to prevent rickets • Nutrition education for community people by health worker s and volunteers • Monitoring activities of both decrees mentioned in	Nutrition Dept Standardization and Specification Authority GHO & DHO Health workers Health Volunteers NGOs	% of children and pregnant mothers consuming vitamin D rich foods

		components of Child Undernutrition and VAD		
Increase the rate of detection and treatment cases for children with rickets symptoms at early stage	Strengthen the screening and treatment capacity of health workers for rickets	• Prepare training manuals and education materials of rickets • Train health personnel and volunteers on the detection and management of rickets • Implement screening and counseling for rickets at health facilities • Refer the case of severe rickets to appropriate hospital	IMCI Nutrition Dept Governorate & District Health Office MOPHP Hospitals Health Workers Volunteers	Detection rate of rickets case at early stage among children % of children with rickets receiving treatment

5. Control of iron deficiency anemia

Objective	Reduce the prevalence of anemia among children under five and women of reproductive age
Target	To reduce the prevalence of anemia to 40% by the year 2020
Justification for target	40% of anemia prevalence is cutoff point for public health problems in WHO criteria.

Strategic objective	Strategic approaches	Activities	Responsibilities	Indicators
Improve the quality and diversity of diet to increase the intake and bioavailability of iron	Increase awareness about iron intake: • iron rich foods • dietary modification for raising iron bioavailability based on local food resources	• National campaign for dietary diversity and modification through mass media and IPC • Nutrition education at health facility and community level*,** • Develop education material • Train Health workers and volunteers*	Nutrition Dept Health Education Center *GHO & DHO **Local council	% of people consuming iron rich foods
	Promote dietary practices to improve dietary diversity and modification			
Promote the use of iron	Advocate the wheat flour	• Development of IEC training	Health education center	% of people

fortified food	producers and traders about the regulation of iron fortification as well as the importance of iron fortification	material** • Orientation workshop to wheat flour producer and traders • Technical training for iron fortification*	Nutrition Dept Standard and Specification Authority Central laboratory	consuming food fortified with iron/folate % of wheat flour fortified with iron in the market
	Strengthen the monitoring system of producing and marketing the wheat flour of iron fortification	• Establish the monitoring system of producing and marketing iron-fortified flour • Develop a guideline of monitoring and evaluation • Train a monitoring personnel • Implement the monitoring evaluation regularly	Environmental Health Dept Standard and Specification Authority Nutrition Dept	
	Improve the current market share of iron-fortified flour	• Advocate dealers and traders of wheat flour		
	Raise awareness of the community about the benefit of using iron fortified foods	• Encourage to use fortified food at health facility and community levels • Develop education material		
Increase the access of iron/folate tablets among pregnant and lactating women	Create awareness of anemia and importance of iron/folic acid supplementation	• National campaign through mass media • Nutrition education at community level*	Reproductive Health Dept Health Education C. PHC Sector GHO &DHO	% of pregnant and lactating women using iron tablet
	Strengthen the government logistic system to distribute iron/folate tablets for pregnant and lactating women	• Develop a guideline of iron/folic supplementation • Train health workers and volunteers for distribution of iron/folate tablets* • Activate the role of health facilities for distribution of the iron/folate tablets* • Involve health volunteers for the distribution*	Reproductive Health Dept Health Education C. Curative medicine sector IMCI Nutrition Dept * Governorate & district level	

		• Strengthen logistic system and monitoring for delivery of iron/folate tablets		
	Promote the treatment of anemia children with iron syrup/tablet	• Follow IMCI/CTC guideline	IMCI	
Reduce the risk factor of parasitic infestation • Malaria • Schistosomiasis • Helminthes	Create awareness about improving living conditions in sanitation, hygiene and environment	• National campaign through mass media • Health education at health facility and community levels	Health Education Center Malaria national program Bilharsia national program Water authority	Prevalence of malaria, schistosomiasis and helminth
	Strengthen the control programs of parasitic infestation	• Train health workers and health volunteers • promote deworming activities for preschool children at community level • Promote deworming activities for pregnant women during second trimester of pregnancy • Involve health volunteers to dose the drug of schistosomiasis control for preschool children at community level	Health Education Center Malaria national program Bilharsia national program Water Authority	
		• Expand existing national program of malaria and schistosomiasis controls		

6. Control of vitamin A deficiency

Objective	Decrease the prevalence rate of vitamin A deficiency disorder among children under five and mothers
Target	To reduce the prevalence of vitamin A deficiency to half of the current level by the year 2020
Justification for target	There is no national data for vitamin A deficiency. The national survey must be conducted to assess the current situation of vitamin A deficiency.

Strategic objective	Strategic approach	Activities	Responsibility	Indicators
Increase the consumption of vitamin A rich food	Create the awareness of the people about the importance of intake of vitamin A rich food for mothers and children	Prepare education material about nutrition including vitamin A rich food	Nut. Dept.	Frequency of the intake of vitamin A rich foods
		Train health workers and health volunteers about nutrition education at communities	Nut. Dept GHO &DHO	
		Educate community people about nutrition and vitamin A and add it in school curriculum	HC/HU (CV)	
	Promote dietary modification to improve the quality and diversity of foods	National campaign for increased home production, consumption and preservation of VA rich foods	Nut. Dept. HEC	
		Support the productive families to produce VA rich foods	MOA	
Increase the covering of foods fortified with vitamin A	Promote the implementation of food fortification with vitamin A	Develop a guideline of food fortification with vitamin A for production	Nut. Dept. SSA	% of vitamin A fortified foods in the markets
		Train the responsible person of the factories which were registered on producing the oil fortified and vegetable fat with vitamin A	Nut. Dept.	
		Establish monitoring system to ensure quality of fortification	Nut. Dept SSA	
		Implement monitoring activities for vitamin A fortification	Nut. Dept SSA	
		Provide technical support the producers and monitoring organizations to ensure sustainability	Nut. Dept SSA	
Increase the coverage of vitamin A capsule for children and mothers	Create awareness of the people about the importance of vitamin A supplementation for children under 5 and mothers	National campaign for vitamin A supplementation	Nut. Dept. EPI HEC	Coverage of Vitamin A supplementation

	Develop the implementation system for the national program of vitamin A supplementation for children under 5 and postpartum mothers	Prepare the guideline of vitamin A supplementation	Nut. Dept. EPI	
		Strengthen the logistics system of vitamin A capsule distribution	MOPHP	
		Ensure the procurement of VA capsule	EPI Nut. Dept. GHO, DHO	
	Promote the implementation of vitamin A supplementation for children and postpartum mothers	Coordinate with EPI sector to implement the VA supplementation	EPI Nut. Dept	
		Train health workers and community health volunteers how to manage the VA supplementation at community level	Nut. Dept. EPI	
		Conduct monitoring and evaluation of the national program of VA supplementation	Nut. Dept. EPI GHO &DHO SSA	

7. Control of iodine deficiency

Objective	To eliminate Iodine Deficiency Disorders in Yemen
Target	To eliminate IDD by the year 2020
Justification for target	If salt iodization is covered 100% according to the law, it is possible to eliminate iodine deficiency disorder.

Strategic objective	Strategic approaches	Activities	Responsibilities	Indicators
To ensure all the people can access iodized salt	Improve the awareness about Iodine deficiency and iodized salt among people	Produce education material about iodine deficiency and iodized salt	Nutrition Dept Health Education Center	% of households consuming iodized salt Coverage of iodized salt in the market
		Train health workers and health volunteers how to create awareness of the importance of iodized salt *	Nutrition Dept GHO & DHO	
		Use mass media to encourage to use iodized salt	Nutrition Dept Health Education Center	

		Implement education of IDD and iodized salt through schools*	Nutrition Dept School Health Dept. MOE * Governorate & District levels	
	Increase the coverage of sufficiently iodized salt in the markets	Produce a technical manual of salt iodization at factory level	Nutrition Dept SSA Environmental Health Dept.	
		Conduct a refresher courses to salt factory to improve the skills so that they can produce adequately iodized salt		
		Encourage the salt factory to have capability of the measurement of iodine		
		Encourage shop keepers and retailers to deal with only iodized salt	Nutrition Dept Consumer protect Office	
	Strengthen the monitoring of salt iodization	Conduct periodic monitoring at salt producer and markets	Nutrition Dept Inspectors(HEO)	
		Train local council and food inspectors at the district level on enforcement of salt iodization law	Nutrition Dept. Environmental Health Dept	
		Collect the monitoring data to analyze the situation of iodized salt at factory and market level	Standard and Specification Authority Environmental Health Dept Nutrition Dept	
		Train laboratory technician	Standard and Specification Authority Nutrition Dept	
		Support equipment to central laboratories for assessment of iodine of salt and urine	Nutrition Dept	
	Strengthen monitoring the use of iodized salt at household level	Collect samples from households by school children and volunteers.	Nutrition Dept School Health Dept.	

	(monitoring should be done at least once a year)		Local council	
		Conduct regular mini-survey on the use of iodized salt	Governorate Nutrition Unit District Environmental Health	

8. Control of zinc deficiency

Objective	Reduce of the prevalence of zinc deficiency
Target	No specific target
Justification for target	There is no national data on zinc deficiency. The national nutrition survey must be necessary as soon as possible.

Strategic objective	Strategic approaches	Activities	Responsibilities	Indicators
Clarify the severity and the target group/area of zinc deficiency	Conduct assessment of zinc status of Yemeni people through food consumption study	Conduct survey to assess food consumption Analyze the data to estimate zinc status	Nutrition Dept Information and statistics dept.	% of zinc deficiency among Yemeni
Increase the zinc intake among people with high risk of zinc deficiency	Increase the accessibility of zinc fortified food to raise zinc intake	▪ Do a feasibility study on the appropriate vehicle to fortify with zinc ▪ Advocate decision makers about the importance of zinc	Nutrition Dept	Decreased % of people with risk of zinc deficiency
		▪ Modify the current micronutrients decree to add the zinc fortification	Legal affairs Nutrition Dept	
		▪ Incorporate the guideline for zinc fortification with the micronutrients general guidelines ▪ Encourage private sectors which can produce fortified foods	Nutrition Dept	
		▪ Conduct technical training courses for food producers	SSA Nutrition Dept	

		▪ Increase awareness of people to consume zinc-fortified foods	Nutrition Dept Health Education Center	
	Increase the accessibility of zinc supplementation for the treatment of diarrhea and severe malnutrition*	• Study on the feasibility of zinc supplementation for the target group • Develop the guideline of zinc supplementation for treatment • Train health workers and volunteers how to use the zinc supplementation	IMCI Nutrition Dept	
		• Ensure the logistic of zinc supplementation	Logistic Dept	
		• Implementation of zinc supplementation at health facilities and community levels	Health Unit Health center	
	Promote dietary modification to raise zinc intake and bioavailability 1) Promote the consumption of animal-source foods for the people facing at high risk of zinc deficiency 2) Raise awareness about reducing inhibitors of Zn absorption, like phytate, by central or household food processing methods to enhance Zn bioavailability	▪ Nutrition education at health facility and community level ▪ Develop IEC material for nutrition message	Nutrition dept Health Education Center	
Reduce the risk factor of high excretion of zinc	Strengthen the implementation of diarrhea control program	• Distribution of ORS • Education for people how to prevent risk of diarrhea • Include the education of hygiene into general training course • Collaborate with IMCI program	IMCI Nutrition Dept	% of children suffering from diarrhea

		for the activities of diarrhea control		

Note:

- Zinc is an essential nutrient required for the normal structure and function of Zn-containing enzymes, including those involved in gene expression, cell division, apoptosis, and synaptic signaling (IZiNCG 2004).
- Zinc can be added to the mineral pre-mixes used in fortification programs in countries with a high or moderate risk of zinc deficiency.

9. School nutrition

Objective:	Reduce the prevalence of undernutrition among school children aged from 6 to 15 years
Target:	To reduce the prevalence of underweight and stunting to half of the current level by the year 2020
Justification for target	Following the target of undernutrition of children under five based on MDGs target

Strategic objective	**Strategic approach**	**Activities**	**Responsibility**	**Indicator**
Improve food intake of school children quantitatively and qualitatively	Increase awareness among school children and their parents about the importance of dietary intake for the physical and mental development of children	Develop education materials in related with nutrition for school children and their families	Nut.Dpt. MOPHP School health Dpt. MOE Related sector *Governorate and District levels	Food intake of school children (?) WT/age-ht /age Learning achievement
		Conduct training course for school teachers how to educate nutrition for children and their families*		
		Revitalize introduction of the curriculum of health and nutrition education through basic and secondary education		
		Provide message of nutrition by teaches at parents meeting*		
		Conduct a week campaigns in each year about good nutrition for school children		

		Mass media messages through mainly radio programs Community activities through motivitaing children to educate their parents about good nutrition		
	Promote the consumption of appropriate breakfast and lunch among school children	Develop dietary guideline for school children [a] Conduct social mobilization of dietary intake and habit of school children through different types of campaigns* Provide message of nutrition by teaches at parents meeting*	Nut.Dpt. MOPHP School health Dpt. MOE Related sector *Governorate and District level	
Decrease the incidence of infectious diseases which interrupt the nutritional status of school children	Promote knowledge, attitude and practice to prevent infectious diseases	Educate school children on health and hygiene at school class* Educate school canteen providers about the food sanitation regulation	School health Dpt. General Control of Infectious Diseases and Surveillance MOE *Governorate and District level	Incidence of intestinal parasitic diseases
	Reduce the risk of helminthes infestation	Develop the program of parasitic infestation control at school level		
	Improve safe water supply and sanitary facilities	Provide safe water supply and sanitary facilities in collaboration with local authority	MOE Authority of water supply Ministry of Water and Environment *Governorate and District level	
Reduce the prevalence of malnutrition at early stage	Refer to under-nutrition of children		Nut.Dpt MOPHP Related sector	Prevalence of malnutrition among among children under five

a. This guideline should include the description of necessity of regularly taking breakfast with appropriate energy amount and nutritional quality.

10. Nutrition in emergency

Objective	Reduce the critical risk of death and malnutrition during emergency situation
Target	No specific target

Strategic objective	Strategic approach	Activities	Responsible	Indicator
Improve the situation of food shortage in the people who suffer from natural or man-made disasters (flood, drought, earthquake, war, food price crisis, etc)	Strengthen food aid system	Develop an implementation plans and guidelines for different situations	MOPHP	% of the affected people who accessed food aid
		Develop logistics system		
	Ensure the affected people have access to minimal nutritional requirements, in particular young children and women	Conduct the assessment of situation (areas, magnitude and population)	MOPHP MOA	
		Estimate necessary amount of food for affected people	Nut Dept	
		Manage an supervised food distribution	DHO GHO	
		Implement monitoring and evaluation	MOPHP	
	Initiate partnership for providing food aid	Take a quick action for communication with internal and external partners	Government	
		Conduct food aid in good collaboration with the partners	MOPHP GHO DHO	
Prevent death cases from malnutrition under emergency	Strengthen treatment service for severe	Develop the manual for treatment of severe	Nut Dept	% of severe malnutrition who

situation	malnutrition	malnutrition during emergency		died after natural and man-made disasters happened
		Train medical stuff members who are involved in treatment of severe malnutrition at the fields	Nut Dept	
		Supply the necessary items for nutritional treatment	MOPHP International donor	
	Promote breastfeeding for infant and young children to reduce the risk of infection and death	Advocate the affected people about the importance of breastfeeding	DHO GHO	
	Prevent food contamination	Advocate the affected people to deal with foods hygienically	DHO GHO	

Guiding Principles for Complementary Feeding of the Breastfed Child
(PAHO and WHO)

1. DURATION OF EXCLUSIVE BREASTFEEDING AND AGE OF INTRODUCTION OF COMPLEMENTARY FOODS.

Practice exclusive breastfeeding from birth to 6 months of age, and introduce complementary foods at 6 months of age (180 days) while continuing to breastfeed.

2. MAINTENANCE OF BREASTFEEDING.

Continue frequent, on-demand breastfeeding until 2 years of age or beyond.

3. RESPONSIVE FEEDING.

Practice responsive feeding, applying the principles of psychosocial care. Specifically: a) feed infants directly and assist older children when they feed themselves, being sensitive to their hunger and satiety cues; b) feed slowly and patiently, and encourage children to eat, but do not force them; c) if children refuse many foods, experiment with different food combinations, tastes, textures and methods of encouragement; e) minimize distractions during meals if the child loses interest easily; f) remember that feeding times are periods of learning and love - talk to children during feeding, with eye to eye contact.

4. SAFE PREPARATION AND STORAGE OF COMPLEMENTARY FOODS.

Practice good hygiene and proper food handling by a) washing caregivers' and children's hands before food preparation and eating, b) storing foods safely and serving foods immediately after preparation, c) using clean utensils to prepare and serve food, d) using clean cups and bowls when feeding children, and e) avoiding the use of feeding bottles, which are difficult to keep clean.

5. AMOUNT OF COMPLEMENTARY FOOD NEEDED.

Start at 6 months of age with small amounts of food and increase the quantity as the child gets older, while maintaining frequent breastfeeding. The energy needs from complementary foods for infants with "average" breast milk intake in developing countries are approximately 200 kcal per day at 6-8 months of age, 300 kcal per day at 9-11 months of age, and 550 kcal per day at 12-23 months of age. In industrialized countries these estimates differ somewhat (130, 310 and 580 kcal/d at 6-8, 9-11 and 12-23 months, respectively) because of differences in average breast milk intake.

6. FOOD CONSISTENCY.

Gradually increase food consistency and variety as the infant gets older, adapting to the infant's requirements and abilities. Infants can eat pureed, mashed and semi-solid foods beginning at six months. By 8 months most infants can also eat "finger foods" (snacks that can be eaten by children alone). By 12 months, most children can eat the same types of foods as consumed by the rest of the family (keeping in mind the need for nutrient-dense foods, as explained in #8 below). Avoid foods that may cause choking (i.e., items that have a shape and/or consistency that may cause them to become lodged in the trachea, such as nuts, grapes, raw carrots).

7. MEAL FREQUENCY AND ENERGY DENSITY.

Increase the number of times that the child is fed complementary foods as he/she gets older. The appropriate number of feedings depends on the energy density of the local foods and the usual

amounts consumed at each feeding. For the average healthy breastfed infant, meals of complementary foods should be provided 2-3 times per day at 6-8 months of age and 3-4 times per day at 9-11 and 12-24 months of age, with additional nutritious snacks (such as a piece of fruit or bread or chapatti with nut paste) offered 1-2 times per day, as desired. Snacks are defined as foods eaten between meals-usually self-fed, convenient and easy to prepare. If energy density or amount of food per meal is low, or the child is no longer breastfed, more frequent meals may be required.

8. NUTRIENT CONTENT OF COMPLEMENTARY FOODS.

Feed a variety of foods to ensure that nutrient needs are met. Meat, poultry, fish or eggs should be eaten daily, or as often as possible. Vegetarian diets cannot meet nutrient needs at this age unless nutrient supplements or fortified products are used (see #9 below). Vitamin A-rich fruits and vegetables should be eaten daily. Provide diets with adequate fat content. Avoid giving drinks with low nutrient value, such as tea, coffee and sugary drinks such as soda. Limit the amount of juice offered so as to avoid displacing more nutrient-rich foods.

9. USE OF VITAMIN-MINERAL SUPPLEMENTS OR FORTIFIED PRODUCTS FOR INFANT AND MOTHER.

Use fortified complementary foods or vitamin-mineral supplements for the infant, as needed. In some populations, breastfeeding mothers may also need vitamin mineral supplements or fortified products, both for their own health and to ensure normal concentrations of certain nutrients (particularly vitamins) in their breast milk. [Such products may also be beneficial for pre-pregnant and pregnant women].

10. FEEDING DURING AND AFTER ILLNESS.

Increase fluid intake during illness, including more frequent breastfeeding, and encourage the child to eat soft, varied, appetizing, favorite foods. After illness, give food more often than usual and encourage the child to eat more.

Guidelines for Iron Supplementation to Pregnant Women

Prevalence of anemia in pregnancy	Dose	Duration
<40%	60 mg iron + 400 µg folic acid daily	6 months in pregnancy
≥40%	60 mg iron + 400 µg folic acid daily	6 months in pregnancy, and continuing to 3 months postpartum

Notes:

- If 6 months duration cannot be achieved in pregnancy, continue to supplement during the postpartum period for 6 months or increase the dose to 120 mg iron in pregnancy.
- Where iron supplements containing 400 µg of folic acid are not available, an iron supplement with less folic acid may be used. Supplementation with less folic acid should be used only if supplements containing 400 µg are not available.

Source: Rebecca J. Stoltzfus, Michele L. Dreyfuss: Guidelines for the Use of Iron Supplements to Prevent and Treat Iron Deficiency Anemia, INACG, http://www.ilsi.org/file/b2_VUHUQ8AK.pdf, 2009

Table

Potential target groups and immunization contacts in countries with vitamin A deficiency

Target group	Immunization contact	Vitamin A dose
All mothers irrespective of their mode of infant feeding up to six weeks postpartum if they have not received vitamin A supplementation after delivery	BCG, OPV-0 or DTP-1 contact up to six weeks	200 000 IU
Infants aged 9–11 months Children aged 12 months and older	Measles vaccine contact	100 000 IU 200 000 IU
Children aged 1–4 years	Booster doses* Special campaigns* Delayed primary immunization doses*	200 000 IU

* The optimal interval between doses is four to six months. A dose should not be given too soon after a previous dose of vitamin A supplement: the minimum recommended interval between doses for the prevention of vitamin A deficiency is one month (the interval can be reduced in order to treat clinical vitamin A deficiency and measles cases).

Source: WHO, Vitamin A supplementation; http://www.who.int/vaccines/en/vitamina.shtml, 2009