

## SCN Working Group on Micronutrients: Information Sharing Template for 2005 and Earlier Activities

### Table 1: Demographic Information

<u>Name of Reporting Individual</u>	<b>LAILA HUSSEIN</b>
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<u>Position</u>	<b>PROFESSOR of NUTRITION and FORMER HEAD OF THE DEPARTMENT</b>
<u>Department/Section</u>	<b>HUMAN NUTRITION AND FOOD SCIENCE</b>

### Table 2: Measurement, assessment, monitoring and reporting micronutrient deficiencies:

<u>Geographic area(s) covered by this table</u>	<b>NATIONAL – TEN OUT OF 26 GOVERNORATES</b>
<u>Project Name</u>	<b>1-National nutrition survey to assess food consumption patterns, their adequacies relative to nutrient requirements 2- Preparation of analytical-based food composition table 3- Epidemiological study to assess the prevalence of infection with <i>H pylori</i> and its negative impact on digestive and extra digestive manifestations.</b>
<u>Supporting Agencies</u>	<b>1- THE EGYPTIAN ACADEMY OF SCIENCE (Project #130) + The Food &amp; Agriculture Organization – UN – TCP/EGY (#1674A) -The British council – Link program</b>
<u>Approximate # of beneficiaries</u>	<b>1- 3900 HOUSEHOLDS (15000 individuals); 3- Analysis of 430 food commodities for 28 macro- and micronutrients</b>

	Micronutrients														
	Iodine	Iron	Folate	Zinc	Calcium	Vit A	Vit B-12	Vit C	Vit D	Vit B-1	Vit B-2	Vit B-3	Vit B-6	Vit K	Vit E
<b>Activities</b>															
<b>Prevalence Assessment</b>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
<b>Training/Capacity Building</b>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
<p>Training on the colorimetric determination of iodine in foodstuffs, table salt and biological fluids at the University of Jena – Germany – UNICEF grant [Mohamed Hassanein]</p> <p>Training on the HPLC separation of carotenoids , vitamins A, B1,2,6, C at the FDA – Georgia – USA- FAO /TCP [Mahmoud Ali ; Ali AboulHassan]</p> <p>Training on the HPLC separation of vitamin A in plasma - Inst Physiologische Chemie – hohenheim- Germany- DFG [Laila Hussein]</p> <p>Training on the microbiological assays of vitamins folate, B12, niacin – Inst Food Research – Norwich- UK – FAO/TCP [Sahar Abdel Aziz; Dept Biochemistry, University of Dublin- Ireland, British Council Link Prog, Mahmoud Ali ; FDA, Washington DC,USA , Laila Hussein]</p> <p>Training on the analysis of minerals and trace elements by the AAS – [Laila Hussein] ; [Magda Soliman], Inst biochemie - Bundesanstalt –Detmold-Germany- DAAD Ahmed Ibrahim, Hoda Bakr - Local training</p>															
<b>Monitoring and Evaluation</b>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
<p><u>Iodine</u> - goiter enlargement (Yamama + Hassanein). Urinary Iodine excretion before and after the distribution of iodinated salt on selected households from the New Valley; <u>Iron</u> -Hemoglobin determination before &amp; after eradication of intestinal parasites &amp; protozoa without or with oral administration of iron. Hemoglobin determination, other hematological indices before and after nutrition intervention with probiotic; <u>Folate</u> -Plasma folate and urinary homocysteine excretion before and after nutrition intervention with probiotic; <u>Zinc</u> -Analysis of hair zinc before and after the administration of vitamin A and Zinc capsules; <u>Calcium</u> -Assessment of the Calcium balance among school children consuming diets without or containing spinach; <u>Retinol</u> -Analysis of plasma retinol among neonates. Follow –up study to assess the milk vitamin A content in relation to the state of disease of the breast-fed infants; <u>Vitamin B12</u> -Assessing the plasma vitamin B12 among neonates and pregnant mothers at delivery. Follow up study analyzing human milk vitamin B12 of lactating</p>															

mothers and urinary methyl malonic acid in the breast-fed infants; Vit C -Colorimetric determination of vitamin C in most fruits, juices and vegetables in common use in Egypt - Estimation of the daily intakes among preschool children; HPLC determination of vitamins B1,B2 & B6, B12, C, niacin in the foodstuffs commonly consumed in Egypt - Estimation of the daily intakes

**Analysis and Reporting**

Most of the studies mentioned above are either published, submitted for publication or in preparation

**Table 3: Food Fortification:**

<u>Geographic area(s) covered by this table</u>	<b><i>The New Valley Governorate – El-Dakhla Oasis</i></b>
<u>Project Name</u>	<b><i>Iodine Status and the impact of Salt iodination</i></b>
<u>Supporting Agencies</u>	<b><i>The National Research Center- UNICEF</i></b>
<u>Approximate # of subjects or beneficiaries for each project described</u>	<b><i>56 Households (ca 250 individuals)</i></b>

	Micronutrients														
	Iodine	Iron	Folate	Zinc	Calcium	Vit A	Vit B-12	Vit C	Vit D	Vit B-1	Vit B-2	Vit B-3	Vit B-6	Vit K	Vit E
<u>Commodities</u>															

**Salt**

Three different levels of Salt iodination providing 30 ; 45 ; 60 ppm . One kg Packages were distributed on selected households, requesting that all cooking will be carried out with the distributed salt. Quality control of iodinated salt available on the market (El Nasr)

Activities

**Policy and Advocacy**

The authorities of the New Valley governorate were contacted requesting permission to examine school children for goiter enlargement. Urine samples were collected from the children for analysis of urinary iodine excretion. Home visits to get consent and approval from the head of the households. Distribution of iodinated salt on the visited households

**Operational Research**

Before starting the salt iodination program, collection of urine samples and samples of cooked foods available at the selected households - analysis of urine for iodine content to estimate the magnitude of iodine deficiency.

<b>Communication Support</b>	<input checked="" type="checkbox"/>																		
Authorities from the administration office of the governorate; Heads of the schools and teachers , members of the households were also quite cooperative and enthusiastic																			
<b>Marketing Support</b>	<input checked="" type="checkbox"/>																		
A law was released for the salt iodination at a level of 30 ppm.																			
<b>Provision of Fortification Equipment</b>	<input checked="" type="checkbox"/>																		
The salt was spread as a thin layer over a plastic sheet lining the bench. Sprayer containing potassium iodate was used to spray the potassium iodate evenly on the salt. The salt was left for a few hours at room temperature																			
<b>Provision of Fortification Supplies</b>	<input checked="" type="checkbox"/>																		
Available at the institute level																			
<b>Fortification Monitoring and Evaluation</b>	<input checked="" type="checkbox"/>																		
Monitoring urinary iodine excretion before and after distributing the iodinated salt																			
<b>Quality Assurance/ Quality Control for fortified foods</b>	<input checked="" type="checkbox"/>																		
Monitoring food iodine content collected from the same household before and after the distribution of iodinated salt																			

#### Table 4: Supplementation:

		Micronutrients														
Activities		Iodine	Iron	Folate	Zinc	Calcium	Vit A	Vit B-12	Vit C	Vit D	Vit B-1	Vit B-2	Vit B-3	Vit B-6	Vit K	Vit E
<b>Prevention Program</b>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>								
Administration of probiotic in yoghurt matrix																
<b>Treatment Orientation</b>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>								
Daily ingestion of live Lactobacillus acidophilus La1 [ $10^{12}$ cfu] for 42 days																
<b>Supplementation project size</b>																
	<b>Efficacy Trials</b>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>								
Changes in blood picture (blood Hb = other haematological indices), plasma folate & vitamin B12																



## **Publications**

### **Vitamin A**

**Awadalla,M., Hussein,L., Salem,M.(1979).**

**Study of fasting vitamin A and tolerance response in common parasitic infestations among Egyptian children. Nutr.Rep.Intern.,19, 627-633.**

**Elnaggar B , Gaafar S , Allam H ,Osman N , Hussein L. (1981). Study of the absorption of oily preparation of vitamin A among school pupils from the rural. Intern.J.vitamin.& Nutr.Res.,51, 3-5.**

**Hussein L , Rashad L , Riyad S , Elnaggar B , Allam H. (1981). The nutritional status of vitamin A among school pupils from the rural. The use of plasma retinol concentration and rose bengal staining as indicators. Nutr.Rep.Intern., 23, 705-711.**

**Hamdy B, Elnokaly F ,Gaafar S , Elnaggar B , Hussein L (1982). Effectiveness of periodic oral vitamin A dosage on hypovitaminosis in Egypt. Intern.J.vitamin.& Nutr,Res., 52, 235 -241.**

**Elnaggar B, Hussein L. (1982). Haematological effects of vitamin A deficiency among Egyptians pupils from the rural. Egypt.J.Heamat.,7, 179-186.**

**Hussein L , El-Nokaly F , Hamdy B. (1985).Patterns of glycosaminoglycans excretions in the urine of Egyptians differing in their vitamin A status. Intern.J.Vitamin.Nutr.Res.,55, 133-137.**

**Hussein L , Drar A , Allam H , Elnaggar B. (1987).Lipid and retinol contents in the milk of Egyptian mothers with normal and sick infants. Intern. J.Vitamin.Nutr.Res., 57, 3 -11.**

**Hussein L , Elshawarby O, Elnaggar B, Abdelmegid A. (1988). Serum vitamin A and carotene concentrations among Egyptian fullterm neonates in relation to maternal status. Intern.J.Vitamin. Nutr.Res., 58, 139 -145.**

**Hussein L , Eltohamy M.(1988). Effect of age and frequency of exposure to pesticides on the nutritional status of Egyptian sprayers. J Clin Biochem & Nutr., 5, 193-199.**

**Gaafar S , Hussein L , Hassan A. (1988).Effect of intestinal parasites on the absorption of vitamin A among adolescent males. J Biomed Sc & Therapy 4, 121-136.**

- Hussein L , El-Tohamy M (1989) Effect of supplementation with vitamin A or plant carotenes on plasma retinol levels among young Egyptian males. Intern. J. Vit. Nutr. Res. 59, 229 -233**
- Hussein L , El-Tohamy M,(1990) Vitamin A potency of carrot and spinach carotenes in human metabolic studies Intern J Vit Nutr Res 60, 229 -235**
- Abdelgani SM, Hussein L , Shaaban S. (1990).Vitamin A status in different stages of schistosomal cases and the effectiveness of oral vitamin A therapy. Z. Ernährungswiss., 29, 249-255.**
- Hussein L , Ali M. (2000) Cord plasma retinol level and its impact on birth weight and growth velocity in infancy Nutr Res 20, 1361 – 1366**
- Hussein,L., Ali, M., Abouelhassan, A., Grzesklewicz, S., Cantellops, D. (2001) Assessment of the fatty acid patterns in vegetable oils, fats and fat – rich foods commonly consumed in Egypt Grasas y Aceites 52, 163 – 170**
- Ezz El-Arab A, Khalil F , Hussein L (2002). Vitamin A deficiency among preschool children in a rural area of Egypt : The results of dietary assessment and biochemical assay. Intern J Food Sc Nutr 53 , 465 – 474**
- Ali M , Hussein L Retinol and carotene analysis of Egyptian foods and estimated daily intakes among an urban population Group. In preparation Vitamin B1**
- Hussein L , Arafa A, Gaafar S.(1988). The vitamin B1 status among young Egyptian males in relation to infection with parasites. Intern J Vitamin Nutr Res , 58, 48-51.**
- Hussein,L., Arafa,A.,Yamamah,G.(1988).The vitamin B1 status among young Egyptians from the Oasis in relation to glucose-6-phosphate dehydrogenase deficiency. Intern J Vitamin Nutr Res , 58, 52-55.**
- Arafa A, Eltohamy M, Ezzilarab A, Hussein L. (1988). The vitamin B1 status among Egyptians occupationally exposed to pesticides. Intern.J.Vit. Nutr.Res., 58, 351.**
- Ezz El-Arab A, Ali M , Hussein L. (2004) Vitamin B1 Profile of The Egyptian Core Foods And Adequacy of Intake J Food Composition & Analysis 17, 81-97**

## **Vitamin B2**

**Ashoub A, Hussein L.(1984). The vitamin B2 status among Egyptian school students suffering from various afflictions as evaluated by the erythrocyte glutathione reductase assay. Nutr.Rep.Intern.29,291-302.**

**Arafa AM, Ashoub AA, Gaafar SA, Yamamah GH, Hussein L. (1989). An investigation into the riboflavin status of young Egyptians from the Oasis with glucose-6-phosphate dehydrogenase deficiency. (1989). Egypt. J. Parasitol. 19, 403-412.**

## **Vitamin B6**

**Arafa,A.,Hussein,L.,(1984). The assessment of the vitamin B6 status among Egyptian school children by measuring the urinary cystathionine excretion. Intern J Vitamin Nutr Res , 54, 321-327.**

**Mohamed A, Hussein L Vitamin B6 analysis of Egyptian foods and estimated daily intakes among an urban population group Food Chemistry, 58, 391-398.**

## **Vitamin B12 + Folate**

**Hussein L , Abdel Aziz S , Tapouzada S , Boehles H. Evaluation of vitamin B12 status in Egypt I. Serum vitamin B12 concentrations among neonates – mother pairs. The underlying determinany factors. Submitted Nutr Res (July 2004) .**

**Abdel Aziz S , Hussein L. Evaluation of vitamin B12 status in Egypt II. Urinary Excretion Patterns of Methylmalonic Acid among breast – Fed Infants and their Lactating Mothers: A diagnostic biomarker of vitamin B12 status. Submitted Nutr Res (July 2004) .**

**Abdel Aziz S , Hussein L. Evaluation of vitamin B12 status in Egypt III. Monitoring the levels of vitamin B<sub>12</sub> in breast milk during the first thirty weeks of lactation. Submitted Nutr Res (July 2004) .**

**Abdel Aziz S , Hussein L. (2005) . Evaluation of vitamin B12 status in Egypt. IV. Food consumption patterns among lactating mothers and their impact on the intake of the vitamin . Intern J Food Sc & Nutr (November –December issue)**

**Mohammad M, Molloy A, Scott J, Hussein L. Plasma cobalamin and folate and their metabolic markers Methylmalonic Acid (MMA) and total homocysteine (tHcy) among Egyptian children before and after the nutritional supplementation with the probiotic bacteria Lactobacillus acidophilus [L1a] in yoghurt matrix Submitted Intern J Food Sc & Nutr Dec 2005**

**Mohammad M, Coward A, Molloy A, Scott J, Hussein L. Cross sectional population-based study to assess the prevalence of infection with Helicobacter pylori among Egyptian children : Its implication on digestive and extradigestive (growth, haematological and biochemical) manifestations. Submitted Public Health Nutrition 2005**

### **Vitamin C**

**Mohammad M , Hussein L. Zinc analysis of Egyptian foods and estimated daily intakes among an urban population group In Preparation**

### **Niacin**

**Abdel Aziz S, Hussein, L. Niacin analysis of Egyptian foods and estimated daily intakes among an urban population group. In Preparation**

### **Vitamin E**

**Fayad I, HusseinL, El-Damhougy S, AbouZekry M, Yamamah G. (1987). Effect of hemolytic factors in faba beans on blood hemolysis and GSH content in G6PD deficiency.Trial of vitamin E therapy. Gaz.Egypt.Paed.Ass. 35, 151-156**

**Eldamhougy S, Elhelw Z, Yamamah G, Hussein L, Fayyad I, FawzyD. (1988).The vitamin E status among glucose-6 phosphate dehydrogenase deficient patients and effectiveness of oral vitamin E. Intern. J.Vitamin. Nutr.Res., 58, 184-188.**

### **Calcium**

**Ghanem K , Hussein L Calcium bioavailability of selected Egyptian foods with emphasis on the impact of fermentation and germination. Intern J Food Sc Nutr 50, 351 – 356**

**Hussein L, Soliman M, Bakr H, Ibrahim A Calcium analysis of Egyptian foods and estimated daily intakes among an urban population group In Preparation**

### **Iodine**

**Hussein L. (1991). An investigation into the iodine status of schoolchildren in the Egyptian Oases. IDD Newsletter 7, 26 - 27.**

**Hassanein M , Anke M, Hussein L (2000). Determination of iodine content in traditional Egyptian foods before and after a salt iodination programme .Polish J food Nutr Sci 9/50, 25 – 29**

**Hassanein M, Hussein L, Robinson E, Mercer P. (2003). Human iodine requirements determined by the saturation kinetics model. J Nutr Biochem 14, 280 – 287**

### **Iron**

**Hussein L, Elnaggar B, Gaafar S, Allam H. (1981). Effects of low levels of iron in hemoglobin values of parasitized school children. Nutr.Rep.Intern., 23, 901-913.**

**Gaafar S , Allam H , Elnaggar B , Hussein L. (1981). Parasitism and anaemia. Statistical analysis of factors governing the relation. Egypt. J.Heamat., 6,167- 176.**

**Abdel-Aziz S , Hussein L (1997). Iron intake and retention in Egyptian boys consuming mixed diet formulae based on beef or beef sausage extended with soy protein concentrate Egypt J Nutr 12, 29 – 46**

## **Selenium**

**Hussein L, Bruggemann J . (1999). Selenium analysis of selected Egyptian foods and estimated daily intakes among a population group. Food Chemistry 65, 527 - 532**

## **Zinc**

**Hussein,L., Ibrahim,N., Khalil,F.,Yamama,G.(1996) Estimated daily zinc intake and the concentration of hair zinc in preschool children from an Egyptian village. In Mengen und Spurenelemente. pp. 254- 256. Proceed. of the 16. Annual Meeting - University Friedrich-Schiller, Jena- Germany**

**Hussein, L., Bruggeman,J.(1997). Zinc analysis of Egyptian foods and estimated daily intakes among an urban population group. Food Chemistry, 58, 391-398.**

**Hussein L National Nutrition Survey to assess the food consumption pattern and its adequacy in relation to requirements. Final Report, Project #130 , Academy of Scientific Research & Technology**

## **Lactose malabsorption**

**Hussein L , Flatz S , Kuhnau W , Flatz G.(1982) Distribution of human adult lactase phenotypes in Egypt. Human Hered., 32, 94-99.**

**Hussein L , Ezzilarab A. (1994) The frequency distribution of lactose malabsorption among adult populations from the Eastern and Western Egyptian deserts. Biochem. Genetics 32, 331 - 342.**