

REPORT 2004

Nestlé Foundation

for the study of problems of nutrition in the world



FOCUSED AND GLOBAL – THE FOUNDATION FOR THE STUDY OF
PROBLEMS OF NUTRITION IN THE WORLD

HIGH IMPACT RESEARCH PROJECTS TO REDUCE MALNUTRITION

INNOVATION – FOR SUCCESS

CAPACITY BUILDING – AS A BASIS FOR IMPROVEMENT

SUSTAINABILITY - A KEY MISSION

PUBLIC HEALTH ORIENTATED

EDUCATION - FOR HEALTH

THE FOUNDATION AT A GLANCE

EVIDENCE BASED – PROACTIVITY

PARTNERSHIP FOR LONG-TERM SUCCESS

enLINK - ING FOR A BETTER WORLD

A photograph of a rural landscape. In the foreground, there is a green field with some brown patches, possibly a rice paddy. In the middle ground, there are several small houses and buildings. In the background, there are large, blue mountains under a clear sky.


HIGH IMPACT

A green wavy line, resembling a stylized wave or a chain link, set against a light green background.

enLINK-ing FOR A BETTER WORLD

A photograph of a group of children sitting on the floor. They are wearing various colored clothing, including white headscarves and blue shirts. Some children are holding books or papers. The background is a plain, light-colored wall.

SUSTAINABILITY



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PRESIDENT'S MESSAGE

The new layout of the Report 2004 of the Nestlé Foundation reflects the current strategy of the Council to fulfill our mandate. Our objective is to study and to propose adequate solutions to the problems of malnutrition in the world. The recent creation of the **enLINK Initiative** reflects the proactivity of the Foundation through its enormous potential to improve public health.

The Foundation's Council has decided to support two areas of activities: projects initiated by the Foundation, represented by the **enLINK Initiative**, and projects proposed by scientists from academic institutions. It is the Foundation's policy to support high-quality projects which are primarily initiated by

local scientists in developing countries. The name **enLINK** represents our efforts to connect different strategies to combat malnutrition. The letters **en** stand for **exploration in nutrition**, in the form of research projects with a global public health relevance, and these letters also stand for **education in nutrition**, which represents one priority of the Foundation.

As an example of the exploration in nutrition, the Council favors a food-based approach to combat malnutrition, because food fortification or supplementation with micronutrients does not address the cause of the problem. Vitamin A deficiency is a preventable cause of childhood



blindness, morbidity and mortality. Spirulina, a blue-green alga, has been proposed for many years as a potential source of vitamin A, but there is as yet no scientific evidence of the vitamin A potency and the vitamin A bioavailability from this alga. A study using modern technology to research these issues has been initiated by the Foundation.

An approach which has been little used worldwide is **education in nutrition**. This includes not only providing an improved knowledge of the food items that must be consumed to meet the nutritional requirements of at-risk individuals, but also teaching basic public health principles that must be implemented. **The weakness of many nutrition interventions is the lack of coordination between hygiene, medicine and nutrition to improve the outcomes.** Contaminated water or intestinal parasites (hookworm infection) can ruin a nutrition intervention. We plan to use a dual-level nutritional education approach. The first level consists in providing information about recent scientific developments to scientists, physicians and health personnel through an electronic nutrition library: **enLINK (electronic nutrition link)**. The **enLINK Library** allows nutrition scientists and health personnel of low-income countries to get free access to the full papers of the main nutrition journals. This initiative of the Nestlé Foundation fills a gap that is, surprisingly, still neglected by international organizations. **The enLINK Library has been welcomed by the scientific community because many scientists and health personnel in developing countries previously had no access to this essential source of information.** The second level of education in nutrition aims to correct the lack of simple scientific knowledge at the population level.

VISION 2004 illustrates the Council's current concept for improving the efficacy of nutritional interventions and includes comments from world leaders in nutrition who share our vision and strengthen our philosophy. As a contribution to the enLINK Initiative, VISION 2004 emphasizes the linkage between education, agriculture, medicine (infections), nutrition and hygiene as a global strategy to combat malnutrition.

I am convinced that these new developments can contribute to the reduction of malnutrition in specific areas. The enLINK Initiative results from the creative mind and the proactive attitude of the Director, Dr. Paolo Suter. The Foundation is grateful to him for these new achievements. I would like to thank the Council members, the Foundation's experts and the assistant to the director, Dr. Elisabeth Müller, for their dedication to the activities of the Foundation. I also want to express my gratitude to Mr. Peter Brabeck, the Chief Executive of the founding company, to Mr. Luis Cantarell, Director, and to Prof. Wolf Endres for their encouragement and the personal interest that they have shown toward the Foundation's activities.

Prof. Dr. E. Jéquier
President Nestlé Foundation



One of the Foundation's main aims is the transfer of scientific and technological knowledge to low-income countries. Until now the Foundation has advanced nutritional science, by supporting nutrition research projects in established institutes and universities and by focused support to existing nutrition schools and educational programs. To further fulfill the mandate of the Foundation as well as to achieve a sustainable improvement in nutrition a new proactive strategic area of activities has been created:

PROJECTS INITIATED BY THE FOUNDATION

THE enLINK INITIATIVE

The first project of the enLINK Initiative is the enLINK digital library. At the research level of the enLINK Initiative the elucidation of the nutritional value of the spirulina algae for the improvement of vitamin A nutriture will be studied in China and on an exceptional basis at Tufts University in the USA.



THE enLINK INITIATIVE

Sustainability and public health relevance are key issues for all activities of the Foundation. Research projects need to result in a short- and long-term public health implementation. Knowledge and know-how have to be sustainable at all levels of the population.

The vast experience of the Foundation's Council as well as past activities led to the creation of the **enLINK Initiative**, an initiative representing the proactivity of the Foundation in its core issues.

This initiative focuses on information transfer in the area of nutrition and malnutrition as well as on the resolution of specific research questions and their implementation at the public health level.

The name enLINK comes from the old English verb "**to enlink**", meaning "**to chain together**" or "**to connect, as by links**". The analysis of the semantic relations of "enlink" reveals related words which illustrate our central concepts and aims: to connect, to join, to associate, to unite, to tie, to conjoin.

Our mission is to link and join cultures, to associate and conjoin institutions and people locally to study and diminish the problems of malnutrition globally.

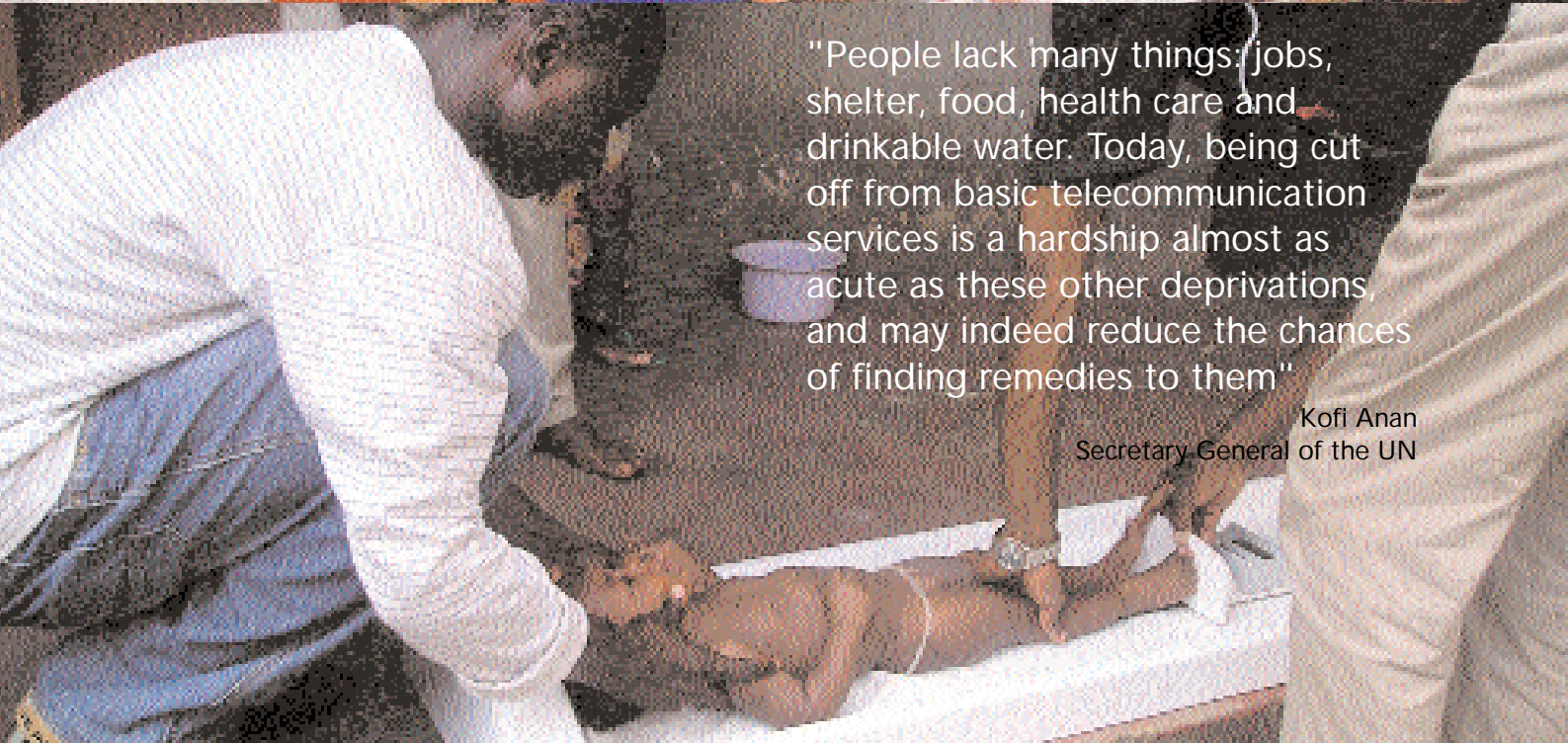
Malnutrition can only be solved by "enlinking" – connecting – different strategies and approaches: malnutrition has to be addressed universally by joint strategies at the level of medical issues (such as infection) and hygiene (such as water quality), and improvements at the level of agriculture as well as in the society at large, and, last but not least, at the level of education and information.

The enLINK Initiative has two main levels:

1. **exploration in nutrition**, which represents the research level, and the
2. **education in nutrition level** for different target populations (such as researchers, health care workers or the general population).

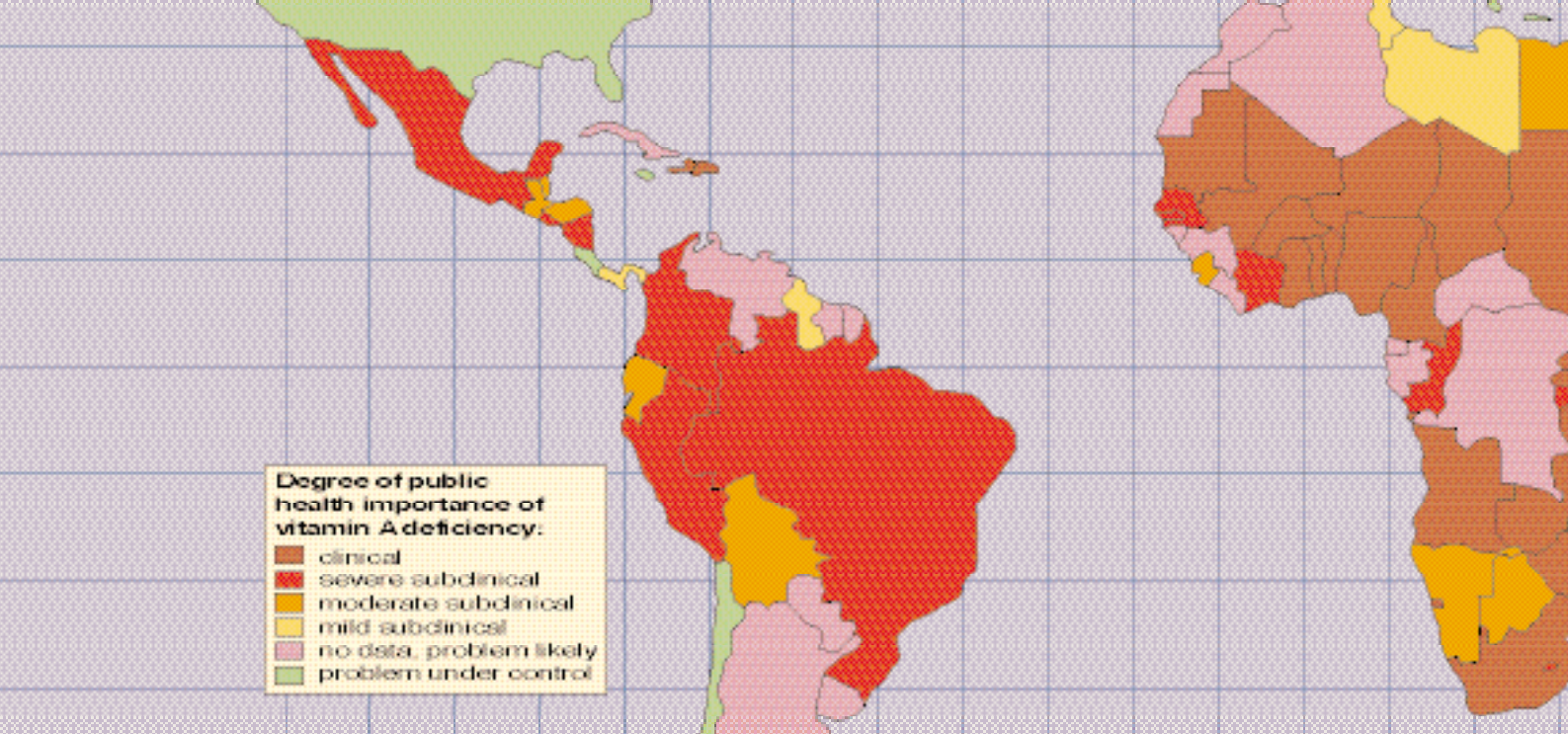
The elucidation of the bioavailability of provitaminA from Spirulina represents the first project in the exploration section of the enLINK Initiative. The enLINK Library – the electronic nutrition library – represents one core component of the educational level of the Initiative.

The solution of the nutritional problems in the world can only be achieved by enlinking capacities, uniting know-how and joining efforts – as the Foundation has done in the past and will continue to do in the future.



"People lack many things: jobs, shelter, food, health care and drinkable water. Today, being cut off from basic telecommunication services is a hardship almost as acute as these other deprivations, and may indeed reduce the chances of finding remedies to them"

Kofi Anan
Secretary General of the UN



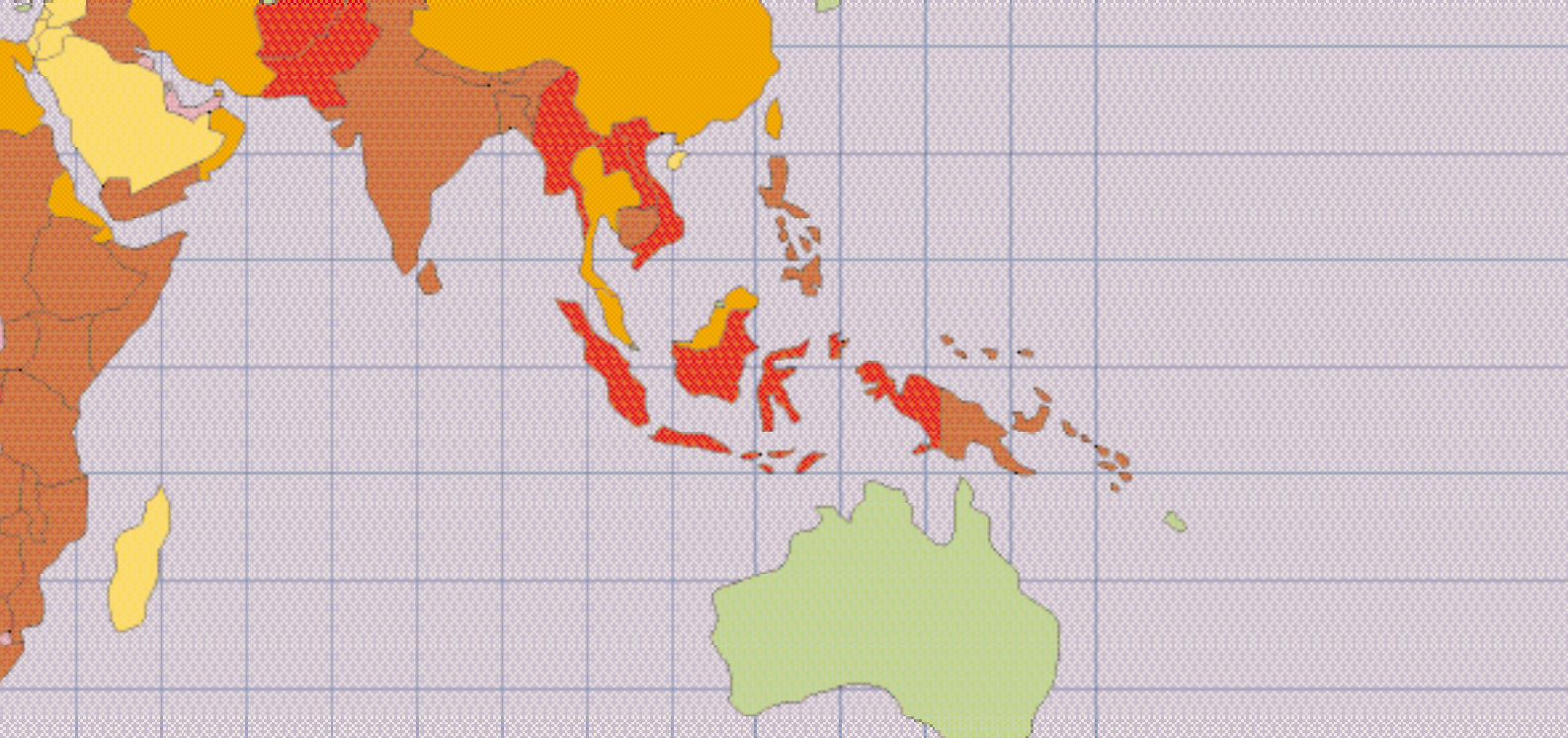
Vitamin A deficiency (VAD) represents the most important preventable single cause of childhood blindness, morbidity and mortality. The major strategies to combat VAD are an improved diet (including breastfeeding from vitamin-A-sufficient mothers), supplementation, and/or food fortification. A food-based approach is favored by the Foundation.

The geographical distribution of vitamin A deficiency parallels the ecological parameters of poverty and overall malnutrition in the world. The key step and public health challenge in the solution to VAD is to increase the availability of affordable vitamin-A-rich or provitamin-A-rich foods. However, the content of vitamin A as well as of provitamin β -carotene varies widely as does the bioavailability, so that there is an urgent need for a good vitamin A source that is easy to grow, affordable, and highly bioavailable. Spirulina, a unicellular blue-green alga, has been identified and promoted in the past as a potentially important vitamin A and protein source. Spirulina would represent an attractive partial solution to VAD. However, there are at present still many open questions, such as vitamin A potency, bioavailability and, last but not least, also toxicological issues.

The Foundation tries to approach the problems of malnutrition with evidence-based research directly relevant to public health. Accordingly, a study to evaluate the vitamin A equivalency of spirulina using modern technology has been initiated.

VITAMIN A DEFICIENCY (VAD) – A FEW FACTS

- Preschool children and pregnant women are most vulnerable for VAD
- Poverty and malnutrition represent the major risk factors
- VAD blindness in children under age five: 2.8 million cases
- 250,000 – 500,000 VAD children become blind each year, half of them dying within 12 months of losing their sight
- VAD represents one of the major causes of impaired immunity and thus increases the risk of infection
- VAD children are 23% more likely to die and 50% more likely to suffer acute measles
- VAD is a major cause of increased maternal mortality
- VAD is a main contributor to poor pregnancy and lactation outcomes
- VAD is a modulator of the vulnerability to anaemia
- VAD modulates the risk of mother-to-child HIV transmission



A project initiated by The Foundation:

VITAMIN A VALUE OF SPIRULINA CAROTENOIDS IN HUMANS

Guangwen Tang, Shian Yin, Gregory G. Dolnikowski, Michael A. Grusak, Jian Qin, Michael Green and Robert R. Russell
Jean Mayer, USDA Human Nutrition Center on Aging, Tufts University, Boston (USA) and
Department of Maternal and Child Nutrition,
National Institute for Nutrition and Food Safety,
Chinese CDC, Beijing, China
USD 191'603

The goal of this project is to determine the vitamin A value (equivalence) of spirulina. The investigation will use intrinsically deuterium labeled spirulina and an isotope vitamin A reference dose in males (n = 16). Deuterium labeled spirulina will be produced

by culturing cells in a nutrient solution with heavy water (deuterium oxide). Two doses will be studied in Boston (USA) (5 g and 10 g). To test the effect of vitamin A status on the bioavailability of spirulina, Chinese adults (n=8, with 10 g of spirulina) will also be studied. The results from this study will be of importance for planning future studies to test the efficacy of adding spirulina to the diet, and for planning the use of spirulina in vitamin A deficiency prevention programs. On an exceptional basis this project will be conducted in the US because advanced, very sophisticated technologies are required for growing the isotopically labeled spirulina and for the tracer analysis to determine the enrichment of the blood samples.

enLINK - RESEARCH





THE enLINK LIBRARY



KNOWLEDGE FOR BETTER NUTRITION AND HEALTH

In May 2004, as a first project in the enLINK Initiative, the Foundation launched, as a joint venture with OVID Technologies Inc. as well as certain publishers, **its digital nutrition library enLINK for individual users** in low-income countries. Putting the library into cyberspace led to a large international media echo and was welcomed by users all over the world, from the Americas to Zimbabwe. The library presently features more than ten key nutrition journals which are freely accessible in full text for registered users. For non-registered users the library offers a searchable database and free abstracts. A regularly updated link list completes this important digital collection for the promotion of nutrition education and knowledge in the world.

enLINK statistics during its first eight months (as of December 31, 2004):

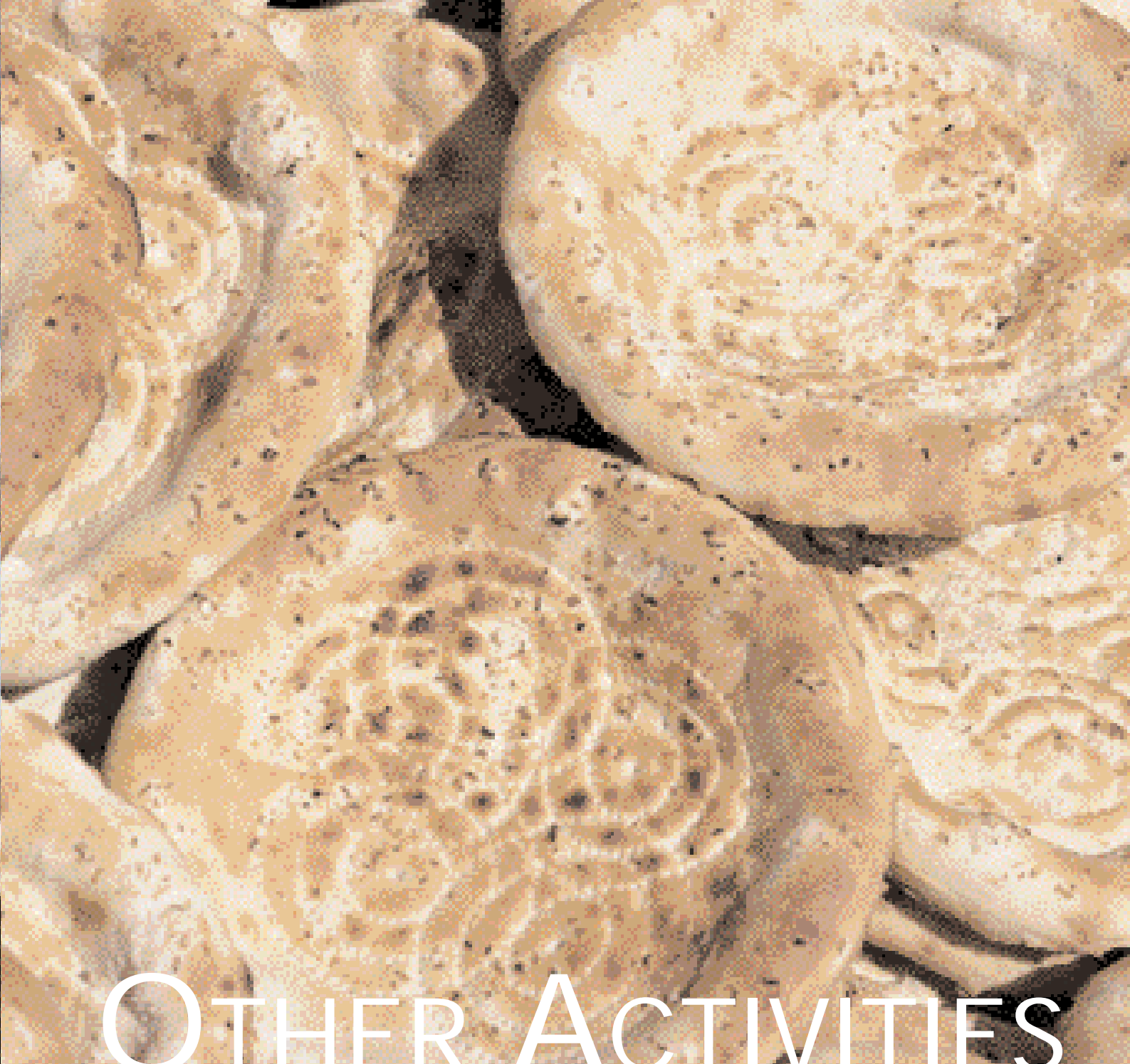
- 30 users from 19 countries
- Nearly 12,000 page views
- More than 40 page views per day

"... enLINK - The Source to reduce the
'know-do' gap in nutrition knowledge."

An enLINK user from Africa







OTHER ACTIVITIES

NEW RESEARCH PROJECTS

INSTITUTIONAL SUPPORT



In 2004 the Council decided to fund 10 research projects.

MACRONUTRIENTS

MICRONUTRIENTS

INFECTIONS AND OTHER DISEASES
AFFECTING NUTRITIONAL STATUS

REHABILITATION FROM MALNUTRITION

NEW RESEARCH PROJECTS

BONE HEALTH

NUTRITION EDUCATION



MACRONUTRIENTS

Changing diets, levels of physical activity and environments and their relationship to the emergence of adolescent overweight and obesity in Ho Chi Minh City, Vietnam

Hong K. Tang and Michael J. Dibley
Community Health Department, University Training
Centre for Health Care Professionals, Ho Chi Minh
City (Vietnam) and Centre for Clinical Epidemiology
and Biostatistics, University of Newcastle,
Newcastle, Australia
USD 100,000

Overweight and obese children and adolescents are becoming more prevalent in urban areas of Vietnam; however, the scientific data describing the situation remains incomplete. It is planned to conduct a cohort study by following up a sub-sample of the children from a cross-sectional study who reside in districts of Ho Chi Minh City where obesity is most prevalent. The cohort study will identify those risk factors related to relative change in BMI (and other indicators of adiposity) over a two-year follow-up period. The results of the proposed study will provide evidence to use in planning and evaluating the most appropriate interventions in the future.

MICRONUTRIENTS

Genetic diversity and selection of cassava (*Manihot esculenta* Crantz) with high β -carotene content using molecular markers

Claudia F. Ferreira
Embrapa Mandioca e Fruticultura (National Center
of Cassava and Fruit Crops Research), Cruz das
Almas, Bahia, Brazil
USD 7'500

Beta-carotene from certain cassava strains may represent an important vitamin A source. The purpose of this project is to use different molecular markers to assist the cassava breeding program and to help identify promising individual strains regarding β -carotene content. The use of molecular markers can open new opportunities in the identification of cassava strains with acceptable levels of this nutrient within a very short period of time.



Effects of multi-vitamin and multi-mineral supplementation on pregnant women and their infants in Chongqing, China

Ting-Yu Li
Children's Hospital, Chongqing University of
Medical Sciences, Chongqing, China
USD 97,560

Young children and pregnant women are the most vulnerable groups for vitamin and mineral deficiencies. In this double-masked, randomized, controlled clinical trial the effect of a multi-vitamin / multi-mineral supplementation on pregnant women and their infants in Kai County (Chongqing) will be studied. The study aims to identify a safe and effective means for preventing vitamin and mineral deficiencies in a population at risk on a large scale. 400 pregnant women, aged from 20 to 35, will be studied from 2-month pre-pregnancy to 12-month postpartum. The changes of symptoms and signs of anemia and infection in pregnant women and infants will be investigated.





Study on the causes of anemia in elderly women in China

Jian Zhang
Department of Elderly Nutrition, National Institute
of Nutrition and Food Safety, Beijing, China
USD: 93,420

The elderly are the fastest growing population in China. Results from several surveys indicate that the anemia prevalence in the elderly is between 20-39%, even reaching 60% in some poor rural areas. Elderly females, particularly those who live in rural areas, have the highest risk of anemia. This case-control study will be conducted to investigate risk factors,

particularly dietary factors, for anemia in elderly women. By analyzing and comparing information on food intake, health status and biochemical measurements, factors which might be protective will be identified. These "positive deviance risk factors" can then be implemented in preventive programs.

Effect of iron fortification of nursery complementary food on iron status of infants

Kim Su Huan
Institute of Child Nutrition, Saesalimdong,
Pyongyang, North Korea
USD 93,850

In North Korea, under the administration of the government, a great number of children are enrolled in the nursery system, and are given meals in the nursery during the day. This is a randomized and double-blinded nursery-based iron intervention study to evaluate the efficacy of iron-fortified complementary food that is cooked in the nursery kitchen. The efficacy and feasibility of a nursery-based iron fortification program will be tested.

NORTH KOREA





Investigation of blood and hair lead and manganese levels in children with different degrees of iron deficiency in Karachi

Mohammad Ataur Rahman & Nessar Ahmed
Department of Biochemistry, Ziauddin Medical
University, Clifton, Karachi (Pakistan) and
Department of Biological Sciences, Manchester
Metropolitan University, Manchester,
United Kingdom
USD 63,112

Multiple evidence suggests that iron deficiency may be accompanied by increased absorption of lead and manganese as these ions compete for the same transporters as iron in the small intestine. Therefore it is hypothesized that children residing in heavily polluted areas may be prone to high blood lead, and possibly also manganese levels. This hypothesis will be tested by investigating blood and hair lead and manganese levels in children with different degrees of iron deficiency. The findings may reinforce the importance of not only reducing lead and manganese environmental pollution, but also the development of national health strategies to reduce childhood iron deficiency.

INFECTIONS AND OTHER DISEASES AFFECTING NUTRITIONAL STATUS

Molecular and biochemical analysis of intestinal microflora in malnourished children with cholera treated with oral rehydration solution with and without amylase resistant starch

G. B. Nair & M. Rahman
ICDDR,B, Dhaka, Bangladesh
USD 21,530

The aim of the present study is to measure the quantity and biodiversity of colonic flora as a function of time in children treated with conventional oral rehydration solution (ORS) as well as ORS containing amylase resistant starch (ARS). Biodiversity of the colonic flora will be studied with the help of temporal temperature gradient gel electrophoresis (TTGE) analysis of PCR products of DNA material extracted from fecal samples. The working hypothesis is that in the group of children receiving ARS, the number of bacteria, the biodiversity and the SCFA profile will improve faster than in the two other groups. Such a pattern should be associated with shorter duration of diarrhea and better catch-up growth.

REHABILITATION FROM MALNUTRITION

Rehabilitation of severely malnourished children in Senegal (West Africa): Use of a local solid food equivalent to WHO F100 with high energetic value

Salimata Wade
Nutrition Group, University of Cheikh Anta Diop,
Dakar, Senegal
USD 33,051

Foods for treatment of severe malnutrition can be prepared in solid form and consumed without added water to prevent bacterial growth. A ready to use therapeutic food (RTUF) industrially prepared and designed to be nutritionally equivalent to WHO recommendations has been proposed as an alternative to WHO F100 solution. RTUF can also be prepared at the community level using local ingredients. RTUF has an energy density that is more than five times that of F100, but a similar ratio of nutrients to energy. The aim of the present study is to evaluate the effectiveness of local RTUF transfer in a community-based nutritional rehabilitation. The objective is to assess the efficacy of community-based rehabilitation of malnourished children using locally produced RTUF in a rural area of Senegal.



BONE HEALTH

Effects of parathyroid hormone on bone metabolism in older people in China

Bo Zhou
Shenyang Medical College, Shenyang, China
USD 113,280

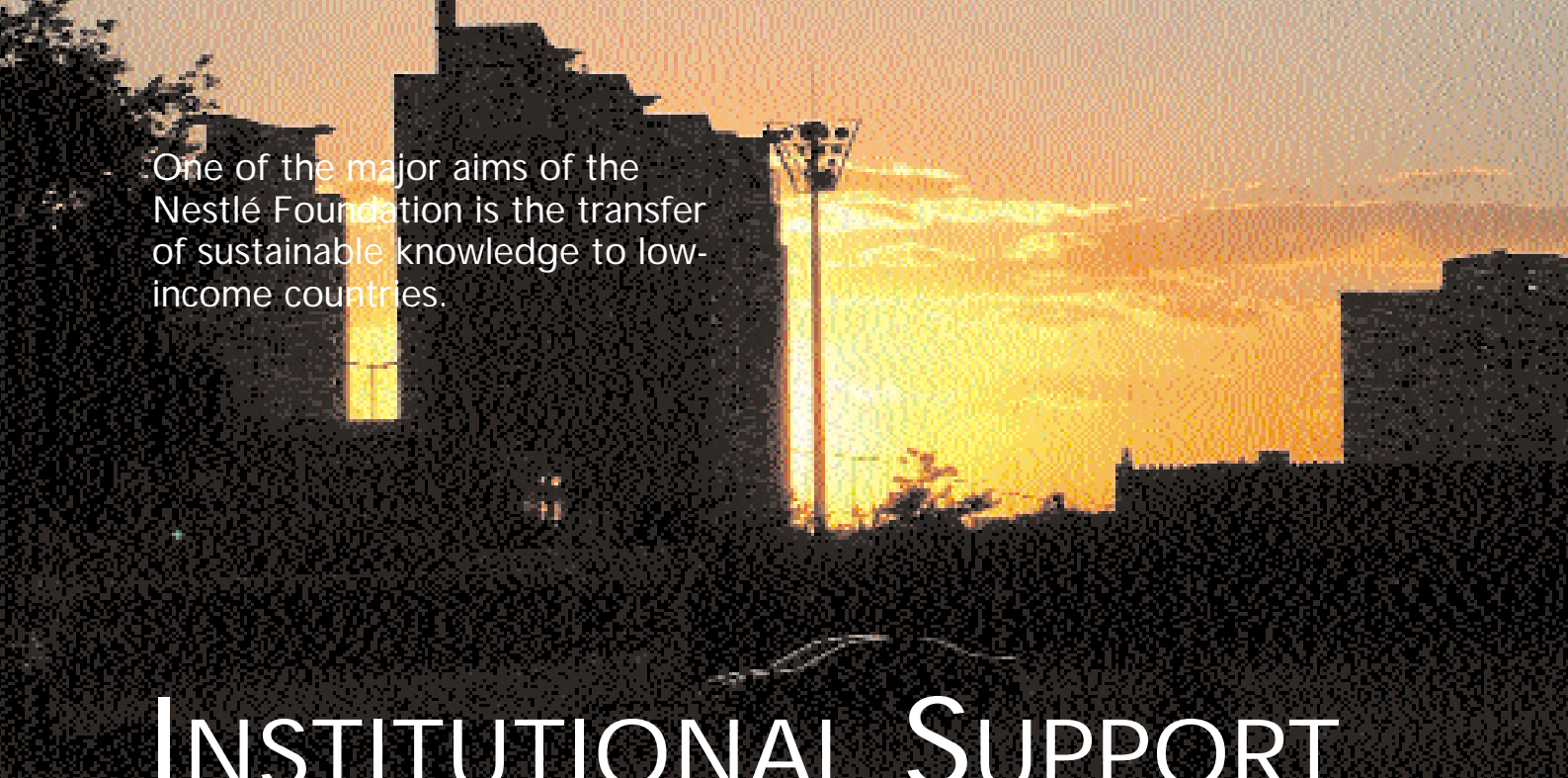
The loss of bone mass (osteoporosis) with aging is a worldwide problem. New evidence suggests that the skeleton of Chinese people may show a different sensitivity and response pattern to the effects of parathormone (PTH). In this research protocol a series of PTH stimulation tests using oral phosphate administration in older people in Shenyang will be done to determine whether phosphate increases PTH secretion to a similar extent as that seen in comparable Caucasian populations in England. The results will help to formulate strategies for the prevention of osteoporosis.

NUTRITION EDUCATION

Nutrition education program for pregnant women in Hunan province

Qian Lin
Department of Nutrition Science, Xiangya Public Health School, Central South University, Xiangya Medical School, Changsha, Hunan, China
USD 60,750

In many areas of the world pregnant women know little about nutrition and often no possibilities exist for pregnant women to seek nutrition advice. Pregnant women in WCHIs (Women Children Health Institutions) will be recruited to take part in a nutrition education program. It is expected that this program will help pregnant women to understand more about nutrition and thus it will promote the nutritional status of the mothers and the babies. The Foundation will reinforce the educational aspect in this study with a core component of the enLINK Initiative.



One of the major aims of the Nestlé Foundation is the transfer of sustainable knowledge to low-income countries.

INSTITUTIONAL SUPPORT

MAKERERE UNIVERSITY

With Norwegian support, a new building was built for the **Department of Food Science and Technology at Makerere University in Kampala (Uganda)**. To improve the teaching and research infrastructure and further various educational activities in the Master of Science in Nutrition program, the Foundation provided this institution with a one-time institutional grant of USD 50,000.

UNIVERSITY OF BENIN

The Department of Nutrition at the **Faculty of Agricultural Sciences of the University of Benin in Abomey-Calavi / Cotonou** is a well-known African institution for nutrition science. To counter the effects of the familiar phenomenon of "brain drain", the Foundation provided a one-year USD 60,000 grant to Mr. Walioli Bodounrin A. Amoussa, a research assistant in the Department of Nutrition, to allow him to get a Master of Science in Nutrition at the London School of Hygiene and Tropical Medicine.

NATIONAL RESEARCH INSTITUTE OF CHILD NUTRITION IN PYONGYANG

To strengthen the nutritional knowledge and research capacities of the **National Research Institute of Child Nutrition in Pyongyang (North Korea)**, two medical doctors, Dr. Rim Hui Yong and Dr. Sim Byong Chol, were supported for a six-month educational stay at Mahidol University (Thailand). During their stay the two fellows focused in particular on basic aspects of nutrition research and study design methodologies. The first result from this intensive educational stay at Mahidol University is an efficacy study to evaluate the potential impact of a nursery-based food-fortification program with iron (see also the section on accepted projects).





"YOU EAT WHAT YOU HAVE."

"YOU EAT WHAT YOU GROW."

"YOU ARE WHAT YOU EAT".

The last statement is well known.
The other two are often forgotten.

The strategies to combat malnutrition are unfortunately often not causal. The lack of micronutrients as well as of energy and protein can be addressed in the short term by the simple delivery of the lacking nutrients (food fortification or supplementation) or food. These approaches are important and efficient in the short term, but are often neither affordable nor sustainable in the long term.

Whenever possible a food-based approach should be favored. For example, the VAC project in Vietnam shows the impact of vegetable gardening in combination with small-scale animal husbandry on the nutritional status of children. Agriculture is the ultimate source of all food and nutrients, which underlines the importance of educating and assisting people in growing and storing their food.

In addition, local and supranational dysfunctions in the food system have to be addressed. As outlined by Ross Welch, agricultural approaches can address the primary causes of micronutrient malnutrition.

Mortality and morbidity due to malnutrition cannot be separated from infection. This vicious cycle has to be interrupted, as illustrated by Peter Hotez in his Vision 2004 statement about human hookworm infection. The interplay of malnutrition, infection and hygiene cannot be dismissed.

Single micronutrients (vitamins or trace minerals) are often regarded as the real "power of food". Yet, as illustrated by the Nestlé Foundation Council member Mehari Gebre-Medhin, energy and protein should not be forgotten.

Give a man a fish and you feed him
for a day. Teach a man to fish and
you feed him for a lifetime.

Chinese Proverb



VISION 2004

Vision 2004 illustrates the linkage of education and know-how, food production (agriculture), medicine (infections) and hygiene in the origin and also causal combat of malnutrition.

The activities of The Foundation try to link together the causal issues and strengthen a food-based sustainable solution to malnutrition.

THE ROLE OF HOMEGARDENING

A VIEW FROM AGRICULTURAL SCIENCE

HUMAN HOOKWORM INFECTION

DO NOT FORGET PROTEIN AND ENERGY



THE ROLE OF HOMEGARDENING

THE IMPACT OF GARDENING AND ANIMAL HUSBANDRY ON NUTRITIONAL STATUS*

Phan Van Huan, BSc, MSc
National Institute of Nutrition, Hanoi, Vietnam

Vietnam, with its 80 million people, is an agricultural country in Southeast Asia. Despite the increase in food production, 30.1% of children under five were reported to be malnourished in the year 2002. Micro-nutrient deficiencies are still the most important public health problem. Sub-clinical vitamin A deficiency is found in 12% of children under age five, whereas iron deficiency anaemia is prevalent in children under two, particularly in rural areas. One of the important solutions to the problem of childhood malnutrition is to promote food production at the family level through the Vegetable Garden, Fish Pond and Animal Husbandry (VAC) system. VAC is an acronym for the Vietnamese words Vuon (Garden), Ao (Pond), Chan nuoi (Animal Husbandry). In the last 20 years, the new term "VAC" has become very familiar to many Vietnamese people. VAC refers to the traditional ecosystem as perceived by Vietnamese people, and it also refers to the idea of developing an eco-organic sustainable agriculture in this country. However, until now few attempts were made to assess the impact of VAC on household food security, income and nutritional status. Our study was carried out in two stages: the first stage was a cross-sectional and the second will be an intervention study.

In the cross-sectional survey, which was conducted in November 2003, the data on food production,

income, expenditure, food consumption of households, weight, height and biochemical parameters (Hb, ferritin, retinol, Zn, β -carotene) of children between age one and six and the nutrition knowledge and practices of the mothers were collected. Interestingly, we discovered that in the group of children under 4 years, there was no difference in the stunting prevalence between the VAC group and the non-VAC group, but for children from 5 to 6 years old, the stunting prevalence is 29.8% in the VAC group compared to 41.1% in the non-VAC group. It may be that child stunting in the later childhood period depends much more on the food availability of the family, while in the earlier period, stunting may depend on feeding practices as well as the fetal nutritional status and the nutritional situation of the mother. Thus we believe that VAC may have an impact on stunting in later childhood, while the underweight prevalence is similar in both VAC and non-VAC groups. The further analysis of the data should look at whether the foods from a family's VAC are the determinant factor for stunting in children in rural areas.

* This project has been supported by The Foundation

"One of the important solutions to the problem of childhood malnutrition is to promote food production at the family level."