



**IAEA**

International Atomic Energy Agency

# Nutritional & Health-Related Environmental Studies Newsletter

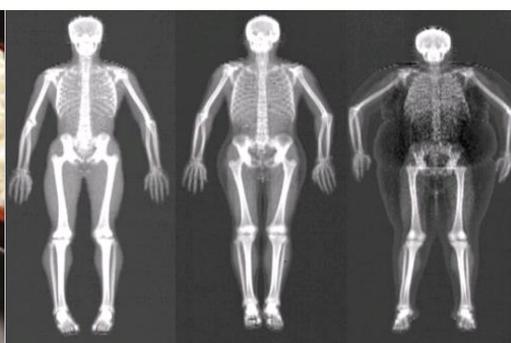
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## To Our Readers

It's my pleasure to address you at the beginning of the New Year 2016 with our third edition of the NAHRES newsletter! We hope you have had a nice holiday season! In this update we will share the outcomes of our technical meeting on environmental enteric dysfunction and summarize for you the highlights of a few other meetings that took place in the second half of 2015.

We are now embarking on our second interlaboratory study on the analysis of doubly labelled water. Do not miss this opportunity if you want to check your analytical performance, and please share this information with your professional networks! The preparation of the Technical Cooperation Programme for 2018-19 starts now – if you have a good idea for a project, check out page 6!

Just before Christmas we had to say 'good-bye' to Christopher Wegner, who was our Junior Professional Officer for 2.5 years. We really hate to see him go. He was such an asset and a great person to have in the team! We wish him well for his next projects and future career! You will find some of his impressions regarding his sojourn at NAHRES in this newsletter.

It is my pleasure to welcome Thabisile Moleah, who joined us in December 2015 from the Technical Cooperation Department of the IAEA. With her background in nutrition and her excellent knowledge of the TC programme, she will assist us for 6 months with implementing ongoing and new TC projects.

With best wishes for a great, healthy, peaceful and prosperous Year 2016!

**Cornelia**



*Cornelia Loechl  
NAHRES, Section Head*

## Meetings

### XVII Latin American Nutrition Congress

The XVII Latin American Nutrition Congress was held at the Barcelo Bavaro Congress Centre, Punta Cana, Dominican Republic 8-12 November 2015. The theme of the congress was ‘Nutrition for Sustainable Development’. In line with this theme, the IAEA hosted a symposium on ‘The contribution of the IAEA Technical Cooperation Programme to Capacity Building in Nutrition for Sustainable Development’. Five young investigators from Bolivia, Brazil, Ecuador, Guatemala and Peru presented data from their Masters’ or PhD theses that had been collected as part of IAEA regional technical cooperation projects. Topics included ‘Nutritional status of breastfed infants in La Paz, Bolivia’, presented by Noelia Urteaga, who also described the stable isotope techniques used to assess breastfeeding practices and body composition; ‘Changes in body composition of breastfed and formula fed Guatemalan infants between 3 and 11 months’, (Monica Mazariegos); ‘Human milk intake of breastfed infants in Manabí province, Ecuador’ (Anny Terán); ‘Feeding patterns and development of motor skills in infants in Macul district of Santiago, Chile’ (Katherine Curi); and ‘Adolescent obesity and risk factors for non-communicable diseases (NCDs) in Vitória, Espirito Santo, Brazil’ (Janine Silva). The session was chaired by Manuel Ramirez, Coordinator of the Research Centre for Prevention of Chronic Diseases at the Institute for Nutrition of Central America and Panama (INCAP), Guatemala. The IAEA was congratulated on its work in support of efforts to prevent malnutrition in all its forms, as Bolivia, Ecuador and Guatemala are three countries in the region still battling against childhood undernutrition, but also dealing with the emergence of obesity and related NCDs.



SLAN panel discussion  
(Photo courtesy of C. Slater)

### An inter-regional project on the evaluation of programmes targeting stunting

Stunting (a condition in which a child does not reach their linear growth potential) affects 159 million children younger than five years, most of them living in 34 countries in Asia, sub-Saharan Africa and Latin America. The global target (Sustainable Development Goal 2.2) is to reduce this number by 40% by 2030, since a stunted child is at higher risk of delayed cognitive development, lower school performance and lower overall productivity.

Stunting can be caused by many factors, including inadequate infant and young child feeding practices, insanitary conditions and a lack of access to health care. Several evidence-based interventions can improve these conditions and are currently implemented by various governmental organizations in low and middle income countries.

The inter-regional project “*Contributing to the Evidence Base to Improve Stunting Reduction Programmes*” aims to provide objective tools to evaluate programmes by using stable isotope techniques to assess: (i) nutrient absorption in the context of insanitary conditions as an underlying cause of stunting; (ii) the impact of breastfeeding promotion; and (iii) quality of growth. These techniques include: (i)  $^{13}\text{C}$  breath tests; (ii) the deuterium oxide ‘dose-to-mother’ technique; and (iii) body composition assessment by deuterium dilution.

A kick-off meeting was held from 25-28 August 2015 at the IAEA Headquarters in Vienna. Participants included government and research institution representatives from 12 countries (all members of the Scaling Up Nutrition (SUN) Movement); nutrition experts and representatives from development



Group picture of the inter-regional pre-project meeting participants (Photo courtesy of IAEA)

organizations. The meeting highlights were posted on the [Scaling Up Nutrition Movement](#) and the IAEA's [Technical Cooperation](#) website.

The project will be implemented over a four year period in collaboration with UNICEF, the World Bank, the Inter-American Development Bank and CARE International, starting in 2016. The results will enable policymakers to identify the most efficient nutritional interventions and devise adequate strategies.

### Meeting on Environmental Enteric Dysfunction

As announced in the August 2015 issue of the NAHRES newsletter, a technical meeting on environmental enteric dysfunction (EED) was held at the IAEA Headquarters in Vienna, from 28-30 October 2015. About fifty experts from diverse professional backgrounds discussed biological pathways, interventions to prevent and treat EED, and the potential role of stable isotope techniques in its diagnosis.

Living in poor sanitary conditions has an impact on growth, immunity and vaccine response through disruption of gut function, referred to as EED. This condition is characterized by microbial translocation, gut and systemic inflammation, leakiness of the gut, altered gut microbiota, and nutrient malabsorption. Developing tools to diagnose and characterize EED for better targeting of interventions in vulnerable populations was considered urgent. Stable isotope techniques could be used to assess body composition, bacterial translocation, and absorptive capacity and permeability of the small intestine. Longitudinal studies to better understand the underlying causes of EED and identifying a low-cost, widely applicable test for epithelial integrity and function were recommended.

The IAEA plans to host a follow up expert meeting in mid-2016 to design a coordinated research project on the use of stable isotope techniques for EED assessment. Publications based on the meeting are in preparation to highlight what is known, opportunities for research to fill the knowledge gaps, recent developments and opportunities for biomarkers of EED, and application of stable isotope techniques such as carbon-13 breath tests in EED diagnosis. The meeting highlights were posted on various forums such as the [Scaling Up Nutrition Movement](#), the

[CMAM Forum](#), the IAEA's [Nuclear Sciences and Applications](#) website, the [IAEA News Centre](#) and the [UN Radio](#).

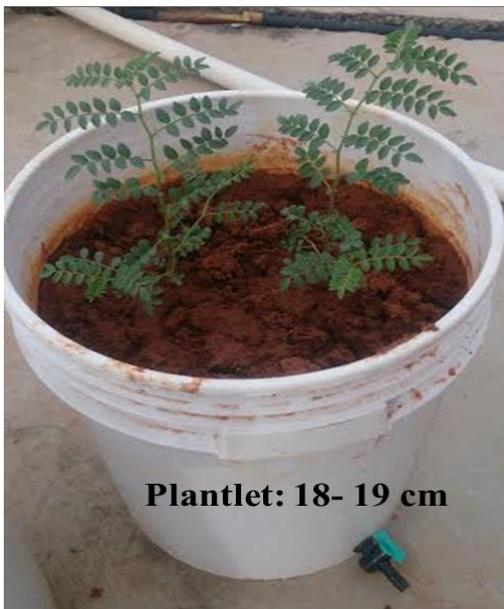


*Contexts in which children live are primed for EED  
(Photo courtesy of Mduzuzi Mbuya; Sanitation, Hygiene, Infant Efficacy (SHINE) Trial)*

### Research Coordination Meeting on Protein Digestibility

The first Research Coordination Meeting of the new coordinated research project (CRP) on 'Bioavailability of proteins from plant based diets' was held at the IAEA Headquarters from 14-17 December 2015. The question of protein quality has recently risen up the research agenda; in particular as it affects the quality of growth in young children. During times of rapid growth, such as pregnancy and the first two years of life, if the foetus or young child does not receive the right combination of nutrients in their diet, they become stunted. Although a large proportion of the population in low and middle income countries rely on plant based diets to meet their protein requirements, little is known about the bioavailability of these proteins in the form in which they are prepared and eaten in family meals. To address this issue, beans commonly consumed in Brazil, India, Jamaica, Mexico, Morocco, Pakistan and Thailand, will be intrinsically labelled with deuterium by adding deuterium oxide to the hydration system at the time the plants are flowering. The beans will be dried and prepared in the usual way, and the bioavailability of the amino acids will be assessed using a dual tracer approach, where a small quantity of a  $^{13}\text{C}$ -labelled protein of known digestibility will be added to the meal. Blood, breath, urine and faecal samples will be collected at intervals following the meal, and the

amino acid enrichment and concentration will be measured using sophisticated mass spectrometry techniques in France, India, United Kingdom and the United States of America. The final aim of the CRP is to develop a minimally invasive technique that avoids blood sampling, and can be used to assess protein requirements of young children, consuming mainly vegetarian diets and living in less than ideal conditions, as far as hygiene and sanitation is concerned. In this CRP nutrition research institutes team up with partners in agriculture research institutes in Asia, Africa, Latin America and the Caribbean, and Europe to address this important nutritional problem.



*Chick peas destined for labelling with deuterium at the University of Agricultural Sciences, Bangalore, India  
(Photo courtesy of S. Sreeman)*

### **59th General Conference Side-Event Radiation Medicine in Cancer: Improving Patient Care**

A side event on 'Radiation Medicine in Cancer: Improving Patient Care' was held during the 59<sup>th</sup> IAEA General Conference in September, and demonstrated the importance of radiation medicine in the modern management of cancer patients. During the side event, delegates had the opportunity to observe the process undertaken to address optimal patient management through the presentation and analysis of a real clinical case of a patient with rectal cancer. The demonstration provided a step-by-step walk-through of how medical professionals including oncologists, radiologists, nuclear medicine physicians, medical physicists, surgeons and nutrition specialists closely interact during the different stages of diagnosis

and treatment, to provide the best possible care for their patient.

Christine Slater explained how a cancer patient's nutritional status affects their response to treatment and vice-versa, emphasizing the importance of nutritional support. Adverse effects of cancer treatment may include sickness or nausea, diarrhoea or constipation as well as pain and weight loss. Due to this, the patient may develop poor appetite, feel full quickly at mealtimes or experience changes in taste perception. A dietician can provide advice on what to eat to try and ease these symptoms and may prescribe special foods to help prevent excessive weight loss, and to improve the patient's nutritional status. Weight loss in cancer is dangerous as the patient not only loses fat but also muscle, leading to severe long-term complications. As loss of muscle mass may not be immediately apparent (especially in overweight and obese patients) nuclear and related techniques are being used to assess the amount of fat and lean tissue in the body, to monitor the impact of nutritional support. These techniques include dual energy X ray absorptiometry (DXA) and bioelectrical impedance monitors (BIA) which have been calibrated using the deuterium dilution technique. DXA, normally used to measure bone mineral content in the diagnosis of osteoporosis, can also provide information on body composition, especially on muscle mass and body fat distribution. BIA does not distinguish between muscle and bone, and other components of lean body mass but rather provides useful information on changes in body composition which are relevant to appropriate nutritional support.



*Child being assessed by DXA  
(Photo courtesy of C. Slater)*

## News

### Re-designation of Collaborating Centre – St. John's Research Institute, Bangalore, India

St John's Research Institute in Bangalore, India was designated as the first IAEA Collaborating Centre for Nutrition in 2010. The re-designation has been approved by the IAEA, pending the official endorsement and the signature of the agreement by the Institute. Research collaboration with the IAEA has focused on assessment of body composition and non-communicable diseases risk, infant and young child feeding practices, energy expenditure/requirements of children, iron bio-availability, food-based strategies to improve vitamin A body pools, amino acid and protein requirements, and infectious diseases such as *Helicobacter pylori* and its linkage to iron absorption. The Institute has produced videos and animations for NAHRES eLearning modules, hosted training courses and workshops, and trained fellows and scientific visitors in stable isotope techniques in nutrition, as well as provided analytical services for analysis of stable isotope enrichment. In the next four years the focus will be on developing new education materials, accurate methods of assessing body composition in infants suitable for use in low resource settings and non-invasive methods of assessing protein digestibility in infants. Capacity building in the use of nuclear techniques in nutrition will remain an important focus.



Handing over of new plaque by Mr. A. Malavasi (IAEA Deputy Director General – Department of Nuclear Sciences and Applications) and Ms. C. Loechl (IAEA Nutrition Section Head) to Mr. A. Kurpad (Head Nutrition Division, St. John's Research Institute), at left.  
(Photo courtesy of IAEA)

### International Year of Pulses

2016 is the United Nations International Year of Pulses (IYP). Pulses, or grain legumes, include 12 crops such as dry beans, dry peas, chickpeas, and lentils, which are high in protein, fibre, and micronutrients. The aim of the IYP is to raise public awareness of the nutritional benefits of pulses as part of sustainable food production aimed towards food security and nutrition. The UN Food and Agriculture Organization (FAO) created a [short video](#) highlighting unique opportunities for pulses to contribute to the future of food security and improved nutrition.

Pulses are important food crops for many people, particularly in Latin America, Africa and Asia, where pulses are part of traditional diets and often grown by small farmers. By replacing animal protein with plant protein, pulses can also contribute to addressing nutritional challenges in the developed world. Pulses have great potential to tackle many chronic health conditions, such as obesity and diabetes. The new IAEA Coordinated Research Project on protein digestibility will contribute important information on the bioavailability of proteins from plant based diets, as they are traditionally prepared and consumed.



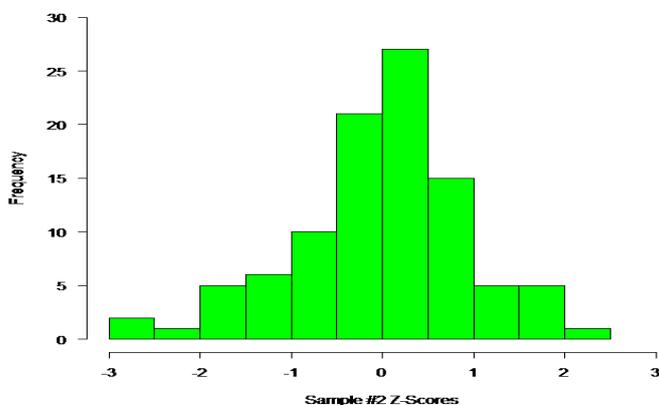
Pulses are an important source of proteins, iron and B vitamins  
(Photo courtesy of ICRISAT)

## Deuterium and Doubly Labelled Water (DLW) Interlaboratory Studies

As part of its ongoing efforts to assure the quality of data produced in IAEA supported projects, NAHRES is currently facilitating two interlaboratory studies: on analysis of deuterium enrichment by Fourier transform infrared spectrometry (FTIR) and analysis of doubly labelled water (DLW) by isotope ratio mass spectrometry (IRMS). During 2015, four water samples for analysis of deuterium enrichment by FTIR were sent to laboratories in 40 Member States. The aim of the study was to identify laboratories that require additional support to produce high quality data. Results have been reported back to the participating laboratories, and the report will be available on the [Human Health Campus](#) soon. Any additional laboratories wishing to participate in this study should contact the Deuterium Inter-Laboratory Study 2015-Contact Point [DInterLab2015@iaea.org](mailto:DInterLab2015@iaea.org), as soon as possible.

Samples of doubly labelled water (DLW) are ready for distribution. Anyone wishing to participate in the DLW interlaboratory study should contact the IAEA Doubly Labelled Water Inter-Laboratory Study 2015-Contact Point [DLWInterLab2015@iaea.org](mailto:DLWInterLab2015@iaea.org).

Please circulate this information to members of your professional networks, who might be interested in participating.



*Distribution of z-scores from measurements of Sample #2  
(Photo courtesy of IAEA)*

## Planning for the IAEA 2018-2019 Technical Cooperation Programme starts NOW

The planning and design of the Technical Cooperation (TC) Programme for 2018-2019 starts now and interested groups should contact the IAEA National Liaison Officer (NLO) in the country to discuss potential project ideas.

Please contact NAHRES in case you don't know who your NLO is: [nahres@iaea.org](mailto:nahres@iaea.org)

The IAEA's TC programme supports human resources and physical facilities towards capacity building activities (i.e., expert missions, meetings, fellowships, special training courses, etc.), networking, knowledge sharing and partnership facilitation. The NLO, a government official in a Member State, coordinates the TC programme within her/his country and serves as the focal point for the IAEA. The NLO is key to all the stages in project design, monitoring and implementation of each Member State's programme. The TC programme operates in two-year project cycles. Each cycle is preceded by a project design phase whereby the Member States submit their project proposals, which are aligned to prioritized developmental needs that can be addressed using well developed nuclear and nuclear-related techniques, to the IAEA.

## Christopher Wegner's Sojourn at NAHRES

My time working as a Junior Professional Officer (JPO) with the Nutritional and Health-Related Environmental Studies Section (NAHRES) at the IAEA was a very enriching and rewarding experience. Coming to work every day and being able to work with top experts in the fields of nutrition and stable isotope techniques has not only enhanced my understanding of the different areas of global public health nutrition, but also elevated my experience with project management, coordination and implementation and facilitated my development as a professional.

During my two and a half years I was able to work on a variety of projects involving distinct areas of nutrition including micronutrient deficiencies (vitamin A and iron), diet diversity and nutrition sensitive interventions. I worked with colleagues on organizing and implementing technical meetings and symposia to

tackle topics of high public health significance such as vitamin A deficiency, capacity building, environmental enteric dysfunction, and moderate acute malnutrition. I also assisted with an interlaboratory study on analysis of deuterium in water samples by Fourier transform infrared spectroscopy (FTIR).

Working for a United Nations agency and having the chance to collaborate with nutrition and health experts from diverse professional backgrounds and different areas of the world was very fulfilling; especially knowing the results of my work would contribute towards low and middle income country capacity building to address malnutrition and its health related consequences in infants, children, and mothers.



Christopher Wegner in Hawaii  
(Photo courtesy of C. Wegner)

## The NAHRES Team

We appreciate your feedback! If you have any questions or comments, please send them to [nahres@iaea.org](mailto:nahres@iaea.org)

### Working for IAEA: Current Vacancies

#### i. [Talent Pipeline for Human Health Professionals and Experts](#)

Location: Vienna, Austria. Closing Date: 2016-02-29. Qualified professionals and experts worldwide who are available for short-term and/or temporary assignments are encouraged to register and create their profiles.

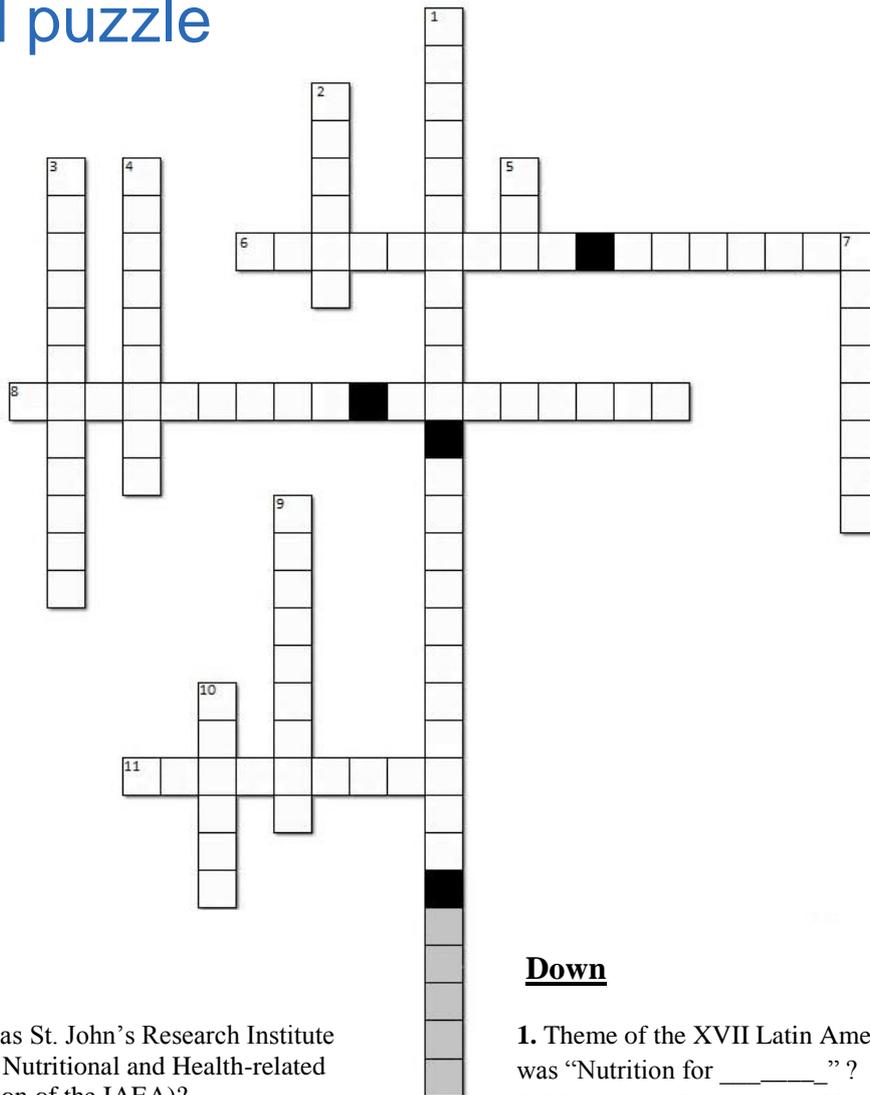
#### ii. [Expert/Lecturer Technical Cooperation \(TC\) Programme](#)

Location: Field (outside IAEA Vienna, Austria). Closing Date: ongoing

TC experts provide specialized on-the-job training, assist project counterparts in developing technical analyses and offer recommendations towards achieving TC project objectives. TC experts may also participate in training courses as lecturers that transfer technical knowledge and skills to training course participants, providing lectures, exercises, etc. Qualified experts worldwide, who are available for short-term and/or temporary assignments, are invited to register and create their Candidate Profile.

Name	Position
Cornelia Loechl	Section Head
Christine Slater	Nutrition Specialist
Victor Ochieng Owino	Nutrition Scientist
Thabisile Moleah	Nutrition Scientist
Souheila Abbeddou	Consultant
Monika Atac-Bauer	Team Assistant
Irmgard Schaepe	Team Assistant
Kirsten Virginia Glenn	Intern

# Crossword puzzle



## Across

6. What electronic service has St. John’s Research Institute provided for NAHRES (the Nutritional and Health-related Environmental Studies section of the IAEA)?
8. Where was the XVII Latin American Nutrition Congress held (country)?
11. St. John’s Research Institute is located in which city?

## BONUS QUESTION

What does SDG stand for?

*Tip:* grey field; related to the solution to “1. Down”

## Down

1. Theme of the XVII Latin American Nutrition Congress was “Nutrition for \_\_\_\_\_” ?
2. 2016 is the “International Year of \_\_\_\_\_” ?
3. Dual energy X ray absorptiometry (DXA) can measure bone mineral content which can help diagnose \_\_\_\_\_ ?
4. Who can provide advice on what to eat to try and ease adverse effects of cancer treatment?
5. Scaling Up Nutrition abbreviation
7. Reduced child growth
9. Stable isotopes are used to measure \_\_\_\_\_ translocation ?
10. Side Event at the 59th General Conference had the title “Radiation Medicine \_\_\_\_\_” ?

## Impressum

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