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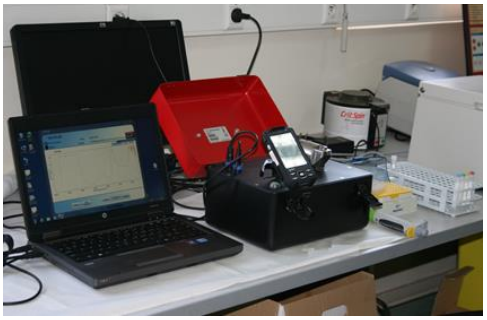
Contents



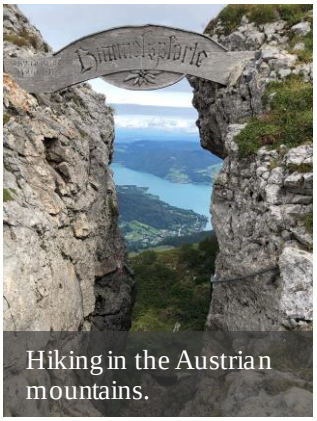
To our readers

Happy New Year!

I hope you have had a good start into 2021! The last year has been challenging and it looks like we will continue this pathway as we enter 2021. We would like to confirm our commitment to support our Member States in improving nutrition in these difficult times. Have a look at the suggestions for conducting IAEA nutrition studies during the COVID-19 pandemic (page 4).

Mainly working from home, we continued with our activities in the second half of 2020 and conducted meetings and training workshops in a virtual format. We have discussed progress of research projects, identified new research agendas, strengthened expertise in deuterium-based isotope techniques and established new collaborations with nutrition societies.

We contributed to the Micronutrient Forum 5th Global Conference CONNECTED 2020 and to the 11th Africa Day for Food and Nutrition Security. Check out new publications presenting results from different IAEA-supported projects. We thank one of our experts for sharing her experiences with providing support to new users of isotope techniques and the UN Nutrition Secretariat for highlighting the latest changes in the UN inter-agency coordination and collaboration mechanism.



Hiking in the Austrian mountains.

Unfortunately, we have to say good-bye to our intern Janna who supported us greatly during this unusual year. We will miss her and wish her all the best for her next steps. Lucia, our new intern, has just started and we welcome her to the team.

May this year bring health, optimism and joy to our lives.
Best wishes,
Cornelia

To our new readers

The International Atomic Energy Agency (IAEA), an organization within the United Nations (UN) system, is the world's central intergovernmental forum for scientific and technical cooperation in the nuclear field. The Nutritional and Health-Related Environmental Studies (NAHRES) Section, part of the Division of Human Health (NAHU), enhances countries' capabilities to combat malnutrition for better health throughout life. It complements the work of other UN agencies, non-governmental organizations and interested stakeholders in the field of nutrition and health by encouraging the use of accurate nuclear techniques to design and evaluate interventions aimed at addressing malnutrition in all its forms. For example, NAHRES supports the application of stable isotopes to measure micronutrient bioavailability and vitamin A status, changes in body composition and physical activity, and infant feeding practices. The support mechanisms of the IAEA include Coordinated Research Activities (CRA) and the Technical Cooperation (TC) Programme. Check out this guide to learn how these mechanisms work. To read more about our work, visit the Human Health Campus website, where you will find information about stable isotope techniques, our projects, guidance documents and learning materials such as eLearning modules, fact sheets and other publications.

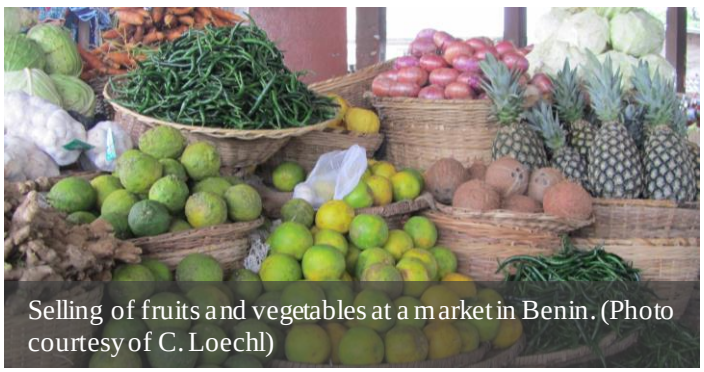
Chilean children doing physical activity at school. (Photo courtesy of S. Gorisek)

Meetings

Experts discuss the food systems-climate change diet quality nexus at an IAEA virtual Technical Meeting

A virtual Technical Meeting organized by the IAEA from 19-21 October 2020 focused on how stable isotopes and related nuclear techniques can be used to evaluate food-based approaches to improve diet quality in the face of rapidly changing food systems driven by adverse events such as climate change and the COVID-19 pandemic. Participants were drawn from over 30 organizations including UN (FAO, WFP, UNSCN), HarvestPlus, International Potato Center, Alliance of Bioversity International, International Center for Tropical Agriculture, USAID, the Regional Center of Excellence against Hunger and Malnutrition (CERFAM, Abidjan), IAEA Collaborating Centre (St John's Research Institute, Bangalore, India), universities and other research institutions. The meeting underscored the need for multi-disciplinary and multi-sectoral collaboration to address diet quality from a food systems and value chain approach and to draw from multiple expertise including agronomy, plant breeding, food science and technology, sociology and nutrition in order to fully understand the pathways that underpin the link between food systems, diet quality and human health outcomes.

Critical points in the food systems value chain where nuclear techniques can help were identified as: plant breeding, soil and water management, crop nutrient composition, nutrient absorption and related nutritional and health outcomes such as body composition. The meeting participants also identified a link between diet quality and environmental enteric dysfunction; the IAEA is already supporting Member States through a coordinated research project (CRP) to develop a stable isotope based diagnostic tool (13C-Sucrose Breath Test). The outcomes of this technical meeting will inform a new research project in the area of diet quality. The meeting was featured in the UNSCN/UNN Nutrition News, Issue 2, December 2020.



Selling of fruits and vegetables at a market in Benin. (Photo courtesy of C. Loechl)

Meetings

Virtual Training Workshop for CRP 'Applying Nuclear Nutrition Techniques to Improve Outcomes for Childhood Cancer in LMIC'

This first clinical focused CRP for NAHRES aims to improve the understanding of the interlinking relationships between cancer, body composition, energy expenditure, interventions and clinical outcomes in childhood cancer. To provide training to the ten countries involved in the CRP and ensure quality measurements across the projects, a training workshop was held in November 2020. Although a hands-on practical workshop would have been preferred, the virtual format did allow many more team members to join in the workshop and learn from the experts, with over 40 team members joining the 3-day workshop. The teams were trained on the doubly labelled water technique by Mr Peter Davies (Australia), on anthropometrical measurements by Ms Wong Jyh Eiin (Malaysia), and the deuterium dilution technique by Ms Grace Munthali (Zambia). The teams also learnt from Ms Erin Gordon's first-hand experience as a paediatric oncology dietician at Boston Children's Hospital (USA). Armed with the expert advice and standard operating procedures for the different techniques, the teams will start recruitment on their longitudinal projects this year.

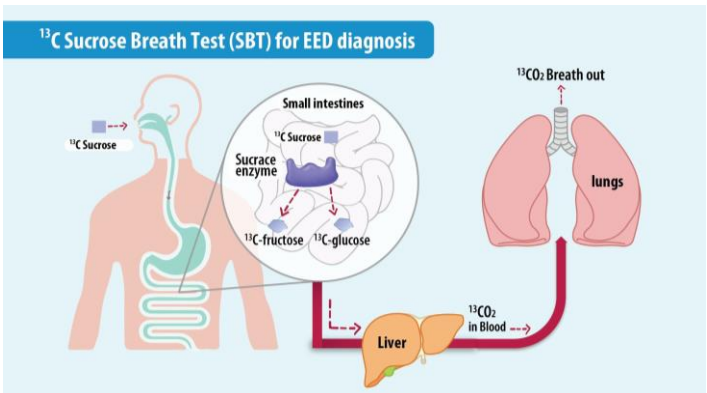
Virtual training of trainers' event on body composition assessment by the deuterium dilution technique

In early November 2020, 12 experts in deuterium-based techniques for nutrition assessments from 11 countries in Asia, Africa, Europe and South America joined a virtual refresher training focusing on recent updates and recommended procedures for the portable Agilent 4500s Fourier Transform Infrared Spectrometer (FTIR). The 3-day training was held to ensure availability of a diverse group of experts to support new users with updated guidance and recommended field and laboratory procedures for body composition assessment. The group consisted of very experienced as well as new experts. They are all eager to help through expert missions once COVID-19 allows international travel again. While it is not ideal to demonstrate laboratory procedures and saliva sampling virtually, these platforms have allowed to bring people together from different places without having to leave everything behind and share experiences with colleagues for mutual benefit. Next time we should allow for more group discussions in breakout sessions. In the NAHRES special on page 9, Ms Consuelo Villegas-Valle from Mexico shares her perspectives as an IAEA expert.

Researchers gather virtually for mid-term progress review of the IAEA's work on environmental enteric dysfunction

The second Research Coordination Meeting (RCM) of the CRP on 'Application of Stable Isotope Techniques in Environmental Enteric Dysfunction (EED) Assessment and Understanding its Impact on Child Growth' (E4.10.16) was held virtually from 14-17 September 2020. The CRP's primary aim is to optimize and validate a 13C-Sucrose Breath Test (13C-SBT) to diagnose and classify EED, a disturbance in gut structure and function, that affects nutrient absorption and is associated with impaired growth in children in low- and middle-income countries (LMIC). During the RCM, countries participating in the CRP presented progress, challenges and lessons learnt with the main drawback being the stoppage of field activities across all sites due to the COVID-19 pandemic. Nevertheless, emerging results on the validation of the 13C-SBT against endoscopy/biopsy show that the CRP is well on course to achieving the intended results.

The 13C-SBT is correlating well with intestinal structural (e.g. villus height) and functional (sucrase enzyme activity) indicators. Final results from the CRP are expected by the end of 2021, subject to the COVID-19 pandemic.



13C-Sucrose Breath Test principle. (Photo courtesy of the IAEA)

Meetings

New collaboration opportunities identified with different nutrition-related societies

Virtual consultations between the IAEA and eleven nutrition-related societies covering all geographical regions took place from 6-9 October 2020 to identify synergies and collaboration opportunities with the aim to enhance outreach and widen the scope of support to nutrition researchers and other stakeholders in Member States. Four individual nutrition societies were represented, six federations of societies and the International Union of Nutritional Sciences. There was a lot of interest in collaborating with the IAEA and willingness to help raise the profile of stable isotope techniques for nutrition assessments.

The areas of collaboration identified focused on the dissemination of IAEA-related information, education, congress participation and publication of results of IAEA-supported projects. The next step in strengthening the collaboration will be the establishment of non-binding frameworks, for example in form of Practical Arrangements between the IAEA and the nutrition societies.

As a follow up to the discussions at the meeting, reduced registration fee for participants from IAEA-supported projects to a society meeting was enabled, links to IAEA eLearning modules will soon be available on websites of some of the societies and NAHRES was invited by the Federation of Asian Nutrition Societies to organize two webinars on stable isotope techniques. In addition, we are busy planning sessions at forthcoming conferences organized by the nutrition societies such as ECO 2021, ASN Nutrition 2021 and SLAN 2021.

If you are collecting samples during the ongoing COVID-19 pandemic, check out these **suggestions for conducting IAEA Nutrition Studies during the COVID-19 pandemic** by clicking on below buttons!

E F S

The first 2-hour webinar on the application of nuclear techniques for the assessment of nutritional status and breastfeeding practices took place on 20 November 2020. Besides highlighting IAEA's contribution to improved nutrition and health, presentations focused on isotopic techniques and body composition in pregnancy and infancy and on results from a TC-supported project (RAS/6/073) on the assessment of human milk intake by breastfed infants using the deuterium oxide dose-to-mother technique.

The second webinar took place on 4 December 2020 with a focus on micronutrient nutrition and energy expenditure. Presentations highlighted IAEA's contribution in nutrition, the measurement of total energy expenditure using doubly labelled water, stable isotope based iron bioavailability studies with examples from India, and the application of stable isotope techniques for the assessment of total vitamin A body stores with examples from Thailand and Indonesia. Both webinars were organized as part of the 2nd International Symposium on Food and Nutrition.

News

IAEA's contribution to the Micronutrient Forum 5th Global Conference, CONNECTED, 9-13 November 2020

The overall theme of the 2020 conference was 'Building New Evidence and Alliances for Improving Nutrition'. Due to the COVID-19 pandemic, the conference was organized in a virtual format. The IAEA sponsored an on-demand session on 'Vitamin A intervention programs – time to reassess how to measure impact'. The urgent need for data on vitamin A to guide public health nutrition programmes was highlighted, results of the CRP on optimizing the isotope technique to assess vitamin A status (E4.30.30) and lessons learned were shared, and considerations of potential policy and programme implications of the new research findings were offered. In another related on-demand session on 'Considerations for benefits and risks for vitamin A interventions', risks and benefits of vitamin A, levels of safe retinol storage, toxicity markers and potential excess intake from vitamin A interventions were discussed.

The plenary sessions and sponsored/on-demand sessions are still available online and accessible for all. Follow the steps as per below:

1. Create an account on the website (free of charge) and log in with the key code sent to your email.
2. Go to *CONNECTED Sessions* and select livestream, on demand or sponsored sessions.
3. Our session is under sponsored sessions. You can also find it by searching for the IAEA logo under *CONNECTED Sponsor* or by clicking here!

New research frontier in understanding the interaction between environmental enteric dysfunction and protein metabolism

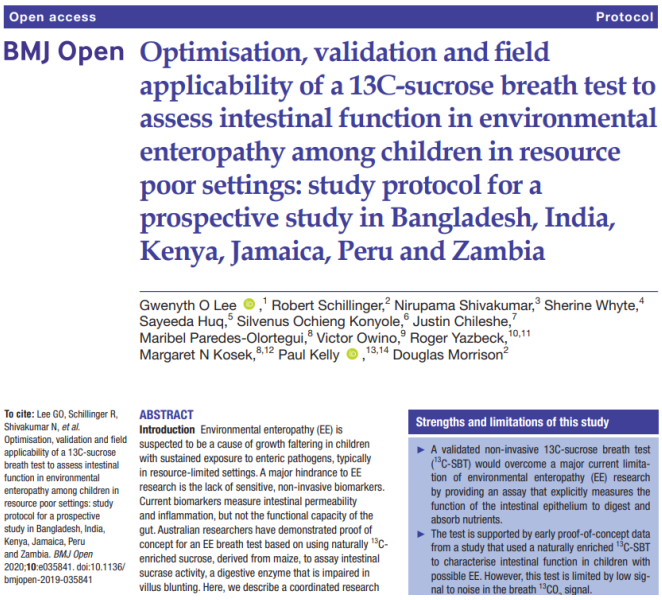
A new Coordinated Research Project 'The Efficacy of Amino Acid Supplementation in Treating Environmental Enteric Dysfunction (EED) Among Children at Risk of Malnutrition' (E4.30.36) was approved by the IAEA management in October 2020 and will start in 2021. Its overall objective is to use a combination of existing nuclear techniques to assess the response of EED to a short course of targeted amino acid supplementation among children.

Children often live in insanitary environments. (Photo courtesy of R. Quevenco/IAEA)

It seeks to merge lessons and results from two on-going IAEA CRPs to provide information on the intersection between EED and protein metabolism. The first CRP (E4.10.16) involves the optimization and testing of the applicability of a novel stable isotope method to diagnose EED in children based on the 13C-Sucrose Breath Test in six LMICs with technical support from Australia and the UK. Under the second CRP (E4.30.31), a stable isotope method to measure protein quality from plant-based diets based on oro-ileal amino acid digestibility has been developed and applied in seven LMICs with technical support from France and the UK. The dual tracer isotope technique, in which an intrinsically deuterium-labeled test protein is simultaneously fed with a different 13C-labelled 'reference' protein, whose digestibility is known, enables the assessment of the true digestibility of indispensable amino acids in the test protein. The technique has already been applied in a cohort of infants and young children below two years of age in India to estimate the true digestibility of indispensable amino acids of commonly consumed foods.

Publications

Optimisation, validation and field applicability of a 13C-sucrose breath test to assess intestinal function in environmental enteropathy among children in resource poor settings: study protocol for a prospective study in Bangladesh, India, Kenya, Jamaica, Peru and Zambia



Open access Protocol

BMJ Open

Optimisation, validation and field applicability of a 13C-sucrose breath test to assess intestinal function in environmental enteropathy among children in resource poor settings: study protocol for a prospective study in Bangladesh, India, Kenya, Jamaica, Peru and Zambia

Gwenyth O Lee ,[1] Robert Schillinger,[2] Nirupama Shivakumar,[3] Sherine Whyte,[4] Sayeeda Huq,[5] Silvenus Ochieng Konyole,[6] Justin Chileshe,[7] Maribel Paredes-Olortegui,[8] Victor Owino,[9] Roger Yazbeck,[10,11] Margaret N Kosek,[8,12] Paul Kelly ,[13,14] Douglas Morrison[2]

To cite: Lee GO, Schillinger R, Shivakumar N, *et al*. Optimisation, validation and field applicability of a 13C-sucrose breath test to assess intestinal function in environmental enteropathy among children in resource poor settings: study protocol for a prospective study in Bangladesh, India, Kenya, Jamaica, Peru and Zambia. *BMJ Open* 2020;**10**:e035841. doi:10.1136/bmjopen-2019-035841

ABSTRACT

Introduction Environmental enteropathy (EE) is suspected to be a cause of growth faltering in children with sustained exposure to enteric pathogens, typically in resource-limited settings. A major hindrance to EE research is the lack of sensitive, non-invasive biomarkers. Current biomarkers measure intestinal permeability and inflammation, but not the functional capacity of the gut. Australian researchers have demonstrated proof of concept for an EE breath test based on using naturally ^{13}C-enriched sucrose, derived from maize, to assay intestinal sucrase activity, a digestive enzyme that is impaired in villus blunting. Here, we describe a coordinated research

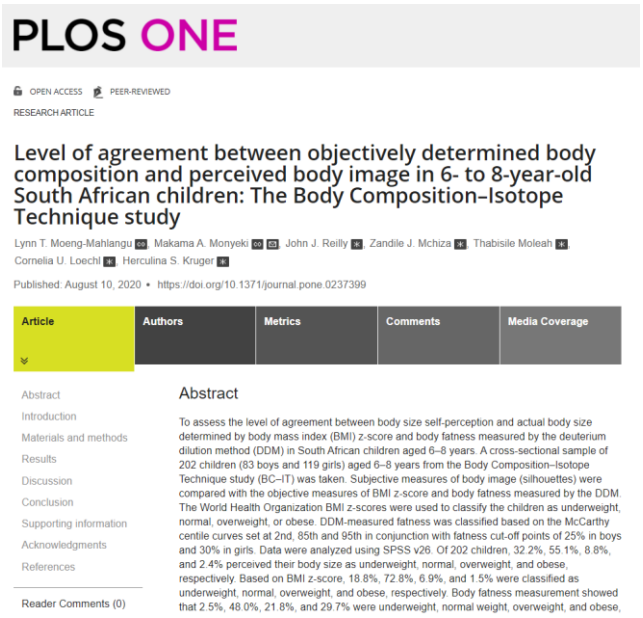
Strengths and limitations of this study

- A validated non-invasive 13C-sucrose breath test (^{13}C-SBT) would overcome a major current limitation of environmental enteropathy (EE) research by providing an assay that explicitly measures the function of the intestinal epithelium to digest and absorb nutrients.
- The test is supported by early proof-of-concept data from a study that used a naturally enriched ^{13}C-SBT to characterise intestinal function in children with possible EE. However, this test is limited by low signal to noise in the breath $^{13}CO_2$ signal.

A new publication titled 'Optimisation, validation and field applicability of a 13C-sucrose breath test to assess intestinal function in environmental enteropathy among children in resource poor settings: study protocol for a prospective study in Bangladesh, India, Kenya, Jamaica, Peru and Zambia' captures on-going IAEA supported efforts to identify an accurate non-invasive tool to diagnose and classify EED in LMICs. A validated 13C-sucrose breath test would allow to measure the function of the intestinal epithelium to digest and absorb nutrients. The published protocol is the basis for an IAEA CRP (E4.10.16). The intestinal sucrase activity is evaluated in two phases: (1) optimization and validation of the breath test, and (2) cross-sectional study in six resource-limited countries to test the usability of the optimized breath test to assess EED in children aged 12-15 months old. Read the full article here (open access)!

Level of Agreement Between Objectively Determined Body Composition and Perceived Body Image in 6- to 8-year-old South African Children: The Body Composition – Isotope Technique Study

This new publication highlights the results on body size self-perception of South African children aged 6-8 years old compared to actual body size determined by body mass index (BMI) and body fatness measured by the deuterium dilution technique. The study was supported by the IAEA under a TC project (SAF/6/020). In conclusion, the level of agreement between body size perception, body fatness, and BMI z-score was poor. Body size self-perception in South African children is generally inaccurate. The use of silhouettes made children either overestimate their own body size while being underweight or underestimate their own body size while being overweight or obese. Read the full article here (open access)!



PLOS ONE

OPEN ACCESS PEER-REVIEWED

RESEARCH ARTICLE

Level of agreement between objectively determined body composition and perceived body image in 6- to 8-year-old South African children: The Body Composition–Isotope Technique study

Lynn T. Moeng-Mahlangu, Makama A. Monyeki, John J. Reilly, Zandile J. Mchiza, Thabisile Moleah, Cornelia U. Loechl, Herculina S. Kruger

Published: August 10, 2020 • https://doi.org/10.1371/journal.pone.0237399

Article | Authors | Metrics | Comments | Media Coverage

Abstract
Introduction
Materials and methods
Results
Discussion
Conclusion
Supporting information
Acknowledgments
References

Reader Comments (0)

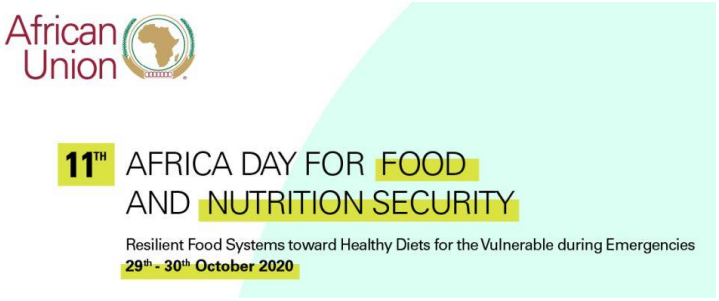
Abstract

To assess the level of agreement between body size self-perception and actual body size determined by body mass index (BMI) z-score and body fatness measured by the deuterium dilution method (DDM) in South African children aged 6–8 years. A cross-sectional sample of 202 children (83 boys and 119 girls) aged 6–8 years from the Body Composition–Isotope Technique study (BC–IT) was taken. Subjective measures of body image (silhouettes) were compared with the objective measures of BMI z-score and body fatness measured by the DDM. The World Health Organization BMI z-scores were used to classify the children as underweight, normal, overweight, or obese. DDM-measured fatness was classified based on the McCarthy centile curves set at 2nd, 85th and 95th in conjunction with fatness cut-off points of 25% in boys and 30% in girls. Data were analyzed using SPSS v26. Of 202 children, 32.2%, 55.1%, 8.8%, and 2.4% perceived their body size as underweight, normal, overweight, and obese, respectively. Based on BMI z-score, 18.8%, 72.8%, 6.9%, and 1.5% were classified as underweight, normal, overweight, and obese, respectively. Body fatness measurement showed that 2.5%, 48.0%, 21.8%, and 29.7% were underweight, normal weight, overweight, and obese,

Success stories

IAEA joins others in the organization for the 11th Africa Day of Food and Nutrition Security

NAHRES participated in a multi-stakeholder steering committee that planned and implemented the 11th Africa Day for Food and Nutrition Security (ADFNS) held virtually from 29-30 October 2020 under the theme 'Resilient Food Systems toward healthy diets for the vulnerable during emergencies: experiences from COVID-19'. On the 29th, NAHRES was represented in a panel of experts in a technical discourse under the theme: 'Leveraging evidence-based innovative interventions to create impact in food and nutrition security'. The support that the IAEA has provided to its Member States to use stable isotope techniques to understand diet quality and its link to nutrition and health outcomes was highlighted. On the 30th, Mr Abdulrazak, Director, TC-Africa, delivered a key message on how IAEA's work in nutrition aligns with the SDGs and African Union's (AU) Agenda 2063, during the main commemoration of the 11th ADFNS, joining a high level panel with other dignitaries including the AU Commissioner for Rural Economy and Agriculture, H.E. Mr Jakaya Kikwete Former President of the United Republic of Tanzania, the CEO of NEPAD, and representatives of other UN Agencies (WFP, UNICEF and FAO). One of the key recommendations of the 11th ADFNS, the call by the AU Commission for strengthening of existing data collection tools that enable obtaining more accurate, reliable and valid information for making a compelling case for investing more in nutrition and food systems, offers a great chance for further showcasing of what nuclear techniques can help with. Read the web-article here!



Mr Laila Lokosang (R), African Union Commission, and H.E. Mr Daniel Kablan (L). (Photo Courtesy of L. Lokosang)

Featuring the 'Nutrition at the Centre' project in Benin during World Breastfeeding Week

Benin faces a high prevalence of stunting (>30%) and its exclusive breastfeeding (EBF) rate is still under 50%. The 5-year integrated 'Nutrition at the Centre' project implemented by CARE International from 2014 to 2017 in the south of the country aimed at reducing child stunting which included the promotion of EBF. Supported by an IAEA interregional TC project on stunting prevention (INT/6/058), the deuterium oxide dose-to-mother technique was used as part of the impact evaluation of the education and counselling on EBF.

Children of mothers who were part of the 'Nutrition at the Centre' project consumed significantly more human milk than those of mothers in the control group and the EBF rate was significantly higher in the project group. These results were highlighted in a web-article on the IAEA website during the World Breastfeeding Week in August 2020 (English, French) and published in the International Breastfeeding Journal: 'Participation in the 'Nutrition at the Centre' project through women's group improved the exclusive breastfeeding practices, as measured by the deuterium oxide dose-to-mother technique' (open access).

NAHRES Special

UN Nutrition: ONE UN for Nutrition

With special thanks to A. Mora and S. Oenema, UN Nutrition Secretariat

The current global nutrition situation demands increased efficiencies and more integrated and streamlined efforts. This is especially relevant as we enter the final decade of the 2030 Agenda and in the context of UN reform.

To respond to the changing nutrition landscape and harmonize efforts at global and country level, in 2020 UNSCN merged with the UN Network for SUN to become UN Nutrition. On 1 January 2021 the UN Nutrition Secretariat became operational, hosted by FAO, like UNSCN used to be.

UN Nutrition is a UN inter-agency coordination and collaboration mechanism for nutrition at the global and country levels. UN Nutrition will work to overcome fragmentation, increase harmonization on nutrition and provide coordinated and aligned support to governments for greater impact for children, women and people everywhere.

Through UN Nutrition, UN agencies, programmes and funds leverage their collective strengths, build synergies, increase efficiencies and complementarities, and ultimately support governments and partners to deliver results on nutrition objectives and targets at all levels, from national to sub-national.

(Photo courtesy of ©Pep Bonet/NOOR for FAO/FAO)

Membership is open to all UN entities aiming to mainstream nutrition to enhance their mandates. IAEA has been a valuable member of UNSCN and UN Nutrition is happy to continue this fruitful collaboration.

UN Nutrition's core functions are:

1. Aligned advocacy and policy coherence for nutrition
2. Identify and coordinate strategic issues around nutrition
3. Emerging issues, knowledge management and innovation
4. Translate global guidance into country-level actions, guidelines and impact

In addition, UN Nutrition will serve as the **UN Network for the Scaling Up Nutrition (SUN) Movement.**

Now that UN Nutrition has become a reality, the Principals of the five constituent members - FAO, IFAD, UNICEF, WFP and WHO - have unanimously accepted the nomination of Ms Naoko Yamamoto, WHO's Assistant Director-General for Universal Health Coverage and Health Systems, as the Chair of UN Nutrition for the years 2021 and 2022.

Contact us at info@unnutrition.org and check unnutrition.org for more updates!

NAHRES Special

A time among friends: the IAEA Expert Mission

With special thanks to R. C. Villegas-Valle, Associated Faculty, Department of Chemical and Biological Sciences-University of Sonora Mexico

I have had the honour of participating in several expert missions of the IAEA, and without a doubt I can say that I have only had amazing experiences. I have visited beautiful places, seen different cultures, but above all, I have met many colleagues that have shared with me their time and their knowledge, and for that I am deeply grateful.

Although I have visited different countries, a common factor has been the great openness of the hosts, both laboratory and field personnel, to receive the information, to update their procedures to the newest recommendations and to share their own tricks-of-the-trade. This collaborative environment - very important for a successful mission - is favoured when the visit is conducted as a time among friends, where the expert is a colleague who is on site not only to present information on the methods, but also his/her own experiences on certain aspects of the techniques, and is willing not only to lecture but to work "hands-on" next to the trainees. Within this friendly environment, the participants feel free to share their concerns and to ask any questions while the visitor is on site, which is important: at this stage, most of the projects are very close to start collecting data, and the aspects covered during the visit can be implemented adequately from the beginning.

Also, the communication channel built during the expert mission gives the participants the confidence to reach out to the expert after the training has ended in case of any issues that may arise during the laboratory or field work. Sometimes, these post-visit consultations (frequently by a phone call or an e-mail) are key to ensure the success of the project the site is conducting.

Lastly, another common factor of all the places I have visited is a great commitment to tackle the nutritional problems they face making the most out of the sometimes limited resources they have. At the end of the day, no matter which region we are from, all our efforts, whether trainers or trainees, aim to improve the nutritional status and the quality of life of people. For them we learn and for them we work.

Photo courtesy of R.C. Villegas-Valle

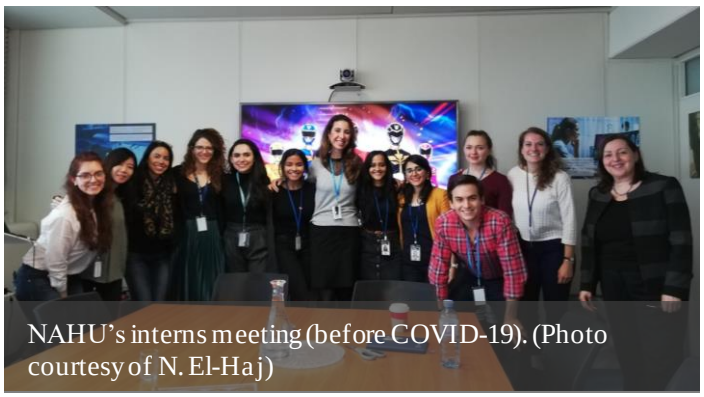
An intern's perspective

With just a few months left until the end of my master's in Nutrition and Health at Wageningen University, I joined the NAHRES team as an intern in February 2020. Before being at the IAEA, I thought that the only role isotopes play in the nutrition field had to do with body composition measurements. Along the way I learned how broadly isotopes can be used. By writing a literature review about the nuclear applications in adult cancer patients I was able to complete my master program.

It has been a challenging year, working from home and changing to a virtual world, as many of you readers must have experienced likewise. Still, I am grateful for having had the opportunity to be part of the amazing NAHRES team. Their professionality, many years of experience and friendliness has helped me to grow enormously.

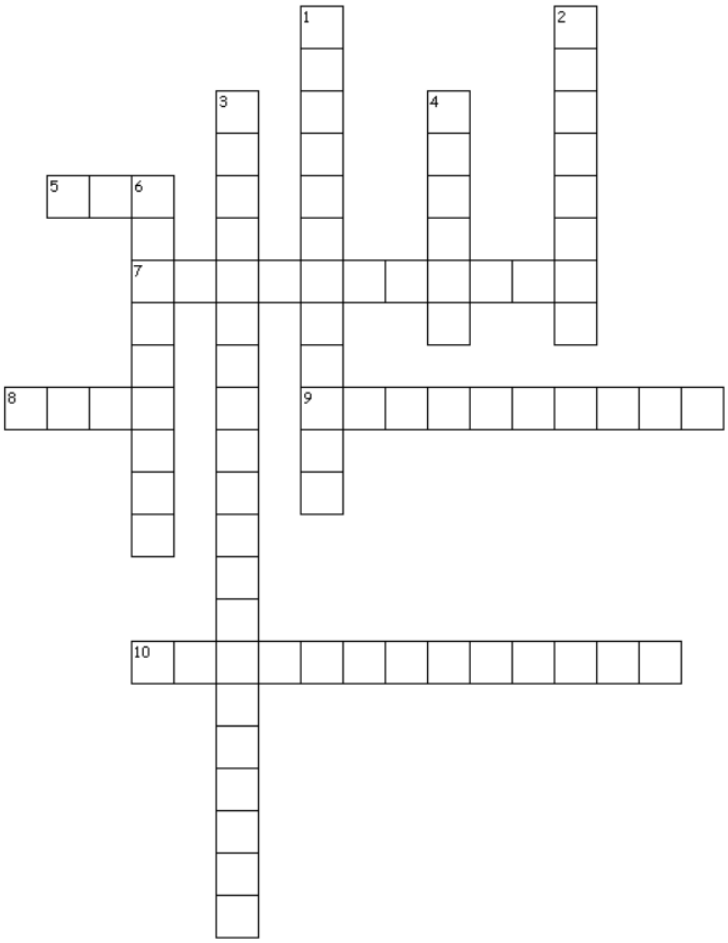
From compiling the newsletter to reporting on our meetings with many people from different fields and countries, the work has never been boring!

With my master's degree in the pocket, I am looking forward continuing my career in the human nutrition field.



NAHU's interns meeting (before COVID-19). (Photo courtesy of N. El-Haj)

Puzzle corner



Across

5. What does the 13C-Sucrose breath test help to diagnose?
7. This is a UN inter-agency coordination and collaboration mechanism
8. This instrument is used to analyse deuterium samples (the abbreviation)
9. Of these small parts is a protein molecule built
10. This practice has in general a positive effect on stunting rates in infants

Down

1. This South-African study found that underweight children tend to ..... their own body size
2. Retinol is one of the forms of this vitamin
3. What does the abbreviation TC stand for?
4. With the 13C-SBT method carbon dioxide samples from the …… are taken
6. This stable isotope is used for the assessment of body composition

Do you want to know the answer? Write us an e-mail to nahres@iaea.org and we will send you the solution!

The NAHRES Team

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Feedback

The NAHRES Team appreciates your feedback! If you have any questions or comments, please send them to:
nahres@iaea.org

Impressum

Nutritional & Health-Related Environmental Studies Newsletter No. 13, January 2021

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