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To our readers

Happy New Year!

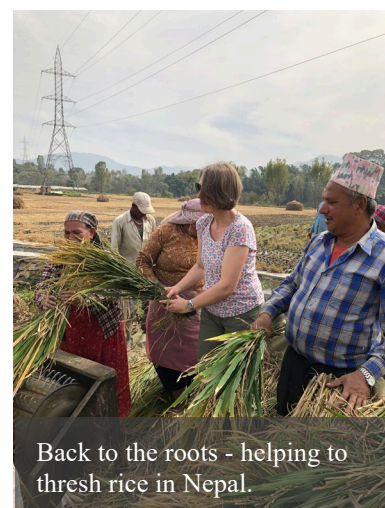
With this newsletter we would like to share the good news that all the planned outputs from our big symposium on the double burden of malnutrition have been published – the report, a brochure and the proceedings. Check out the links on page 8. It was great that the publication of the proceedings coincided with the launch of The Lancet Series on the double burden of malnutrition. This increased the momentum and reinforced the importance of combating the double burden of malnutrition.

You will also find summaries on meetings, conferences we contributed to, events we organized and latest publications. Success stories from the European region, Jamaica and on amino acid digestibility demonstrate the benefits of the isotope techniques. Don't miss the information on page 4 on the formulation of new TC projects for 2022/2023 which starts now! Let us know if you have a great project idea. Many thanks to UNSCN for giving us an update on nutrition and food systems at the climate conference in Madrid.

Unfortunately, we have to say good-bye to our intern Daniela who has been such a wonderful help. We will greatly miss her! I wish her all the best for her future activities.

I hope to see many of you at the Micronutrient Forum Global Conference.
Best wishes for a productive and joyful year,

Cornelia



Back to the roots - helping to thresh rice in Nepal.

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 e-learning modules, fact sheets and other publications.



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

Meetings

4th Federation of African Nutrition Societies (FANUS) Conference

From 26-29 August 2019, over 300 health and nutrition professionals from across the globe gathered in Kigali, Rwanda at the 4th Federation of African Nutrition Societies (FANUS) Conference and deliberated on the actions needed to address malnutrition for sustainable development in Africa. How the IAEA helps its African Member States to use stable isotope techniques to understand the dynamics of the double burden of malnutrition, with a focus on the relevance of body composition, was presented. Further, there was a dedicated stable isotope session where results from an IAEA-supported project (RAF/6/052) on the link between previous exposure to either severe or moderate acute malnutrition on child growth, body composition, brain development and survival were presented. Emerging results from the Democratic Republic of the Congo (DRC), Ethiopia, Malawi, South Africa and Uganda, showed that individuals who were malnourished in childhood have poorer nutritional status and have increased risks for metabolic dysfunction and mortality. A researcher from Kenya also presented on a separate IAEA-supported Coordinated Research Project (CRP) aiming to optimize a stable isotope-based breath test to diagnose Environmental Enteric Dysfunction (EED), a condition



Panelists at FANUS session. (Photo courtesy of V. Owino)

associated with stunting among children. Results from South Africa (SAF/6/020) also showed that body fat estimation based on body mass index underestimates the prevalence of obesity by more than 10% compared to when deuterium dilution is used. During this meeting, the participants had the opportunity to learn from presentations, country experiences and scientific discussions, as well as to network with other professionals from Africa and beyond. Over the four days, they discussed innovations in the field and took pride in the successes of their countries' efforts to scale up nutrition interventions with the goal of better human health and well-being for their countries and region.

Meetings

Africa Day for Food and Nutrition Security (ADFNS)

The 10th Africa Day for Food and Nutrition Security was held in Cairo, Egypt from 29-30 October 2019. IAEA's work in nutrition and how African countries have leveraged the TC Programme to address different forms of malnutrition were presented by Mr Owino, NAHRES Nutrition Specialist, and counterparts from Morocco and Zambia during the technical dialogue session held on 29 October. Mr Owino highlighted how the IAEA has helped its Member States in Africa to build capacity in the use of stable isotopes to address malnutrition in all its forms. For example, African institutions can now apply techniques like deuterium dilution to accurately assess infant and young child feeding practices, body composition in relation to obesity and undernutrition. Prof Hassan Aguenau from the African Regional Cooperative Agreement for Research, Development and Training related to Nuclear Science and Technology (AFRA) Regional Designated Centre for Nutrition in Rabat, eloquently explained how the use of isotopes has helped the Moroccan government to formulate a new policy on fortification of wheat flour with a more readily bioavailable form of iron and to address rising obesity cases by accurate measurement of fat deposition through deuterium dilution. Dr Kasonka from the University Teaching Hospital in Lusaka, Zambia, described how the use of deuterium dilution is helping them to better explain the link between exposure to severe acute malnutrition in early childhood and the risk for metabolic dysfunction. These presentations laid the ground for subsequent discussions with Dr Lokosang, Advisor Food & Nutrition Security, African Union Commission (AUC) on areas of common interest and a strategy to enable sharing of knowledge on the usefulness of the application of stable isotopes throughout the continent.



Mr Owino with AUC and International Organization Representatives. (Photo courtesy of V. Owino)

General Conference side events

Improving management of cardiovascular diseases (CVDs) in women

Ms Alford, Nutrition Specialist in NAHRES, contributed to the side event of the IAEA's General Conference with her presentation on the importance of nutrition and physical activity in the prevention of CVDs in women. Cardiovascular diseases are a leading cause of death for women worldwide, affecting millions. Out of 430 million global new cases of cardiovascular diseases each year, 250 million occur in women; heart attacks alone claim the lives of 3.3 million women every year. Maintaining a healthy weight and body composition, being physically active and following a healthy diet may prevent over 72% of premature deaths related to CVDs. Stable isotopes can be used in assessing body composition and energy expenditure to evaluate lifestyle interventions aimed at preventing CVDs in women.

Global energy expenditure data – Helping countries to tackle growing obesity crisis

In a second side event, the first comprehensive database on human energy expenditure was highlighted. Presentations covered the type of data included, the method used to collect the data, the questions the data can answer, the history of the database and the usefulness of the data from a country's perspective. This IAEA database contains over 6600 measurements collected using the doubly labelled water method since 1981. This database will help researchers look for example at the impact of growing sedentary lifestyles on dietary needs and whether energy expenditure has declined during the obesity epidemic.



Ms Najat Mokhtar, Head of the Department of Nuclear Sciences and Applications opens the event. (Photo courtesy of L. Bertagnoli)

Meetings

Nutrition workshop for SIDS Member States

We had the unique opportunity to bring nutrition counterparts from the Small Island Developing States (SIDS) together for a workshop, gratefully hosted by Mauritius under TC project INT/0/093. This workshop gave the participants the chance to discuss and share experiences about the nutrition situation in SIDS and how stable isotope techniques can be used to address their SIDS nutrition priorities. Establishing this network of nutrition professionals across the globe who share the common opportunities and challenges of SIDS is the first step to building capacity in nutrition



Participants of the workshop. (Photo courtesy of N. Joonas)

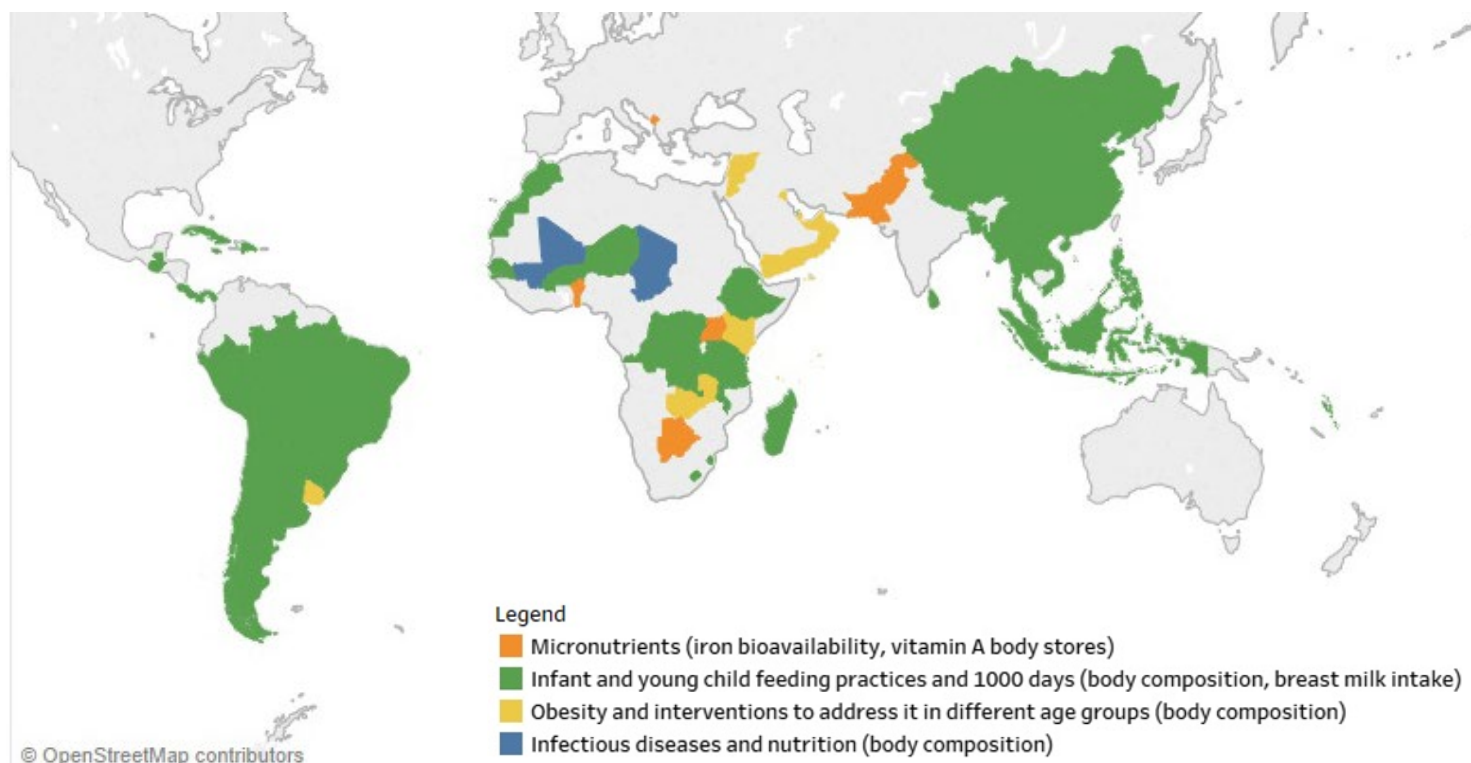
nuclear techniques for many of these new Member States.

News

New Technical Cooperation Cycle

The TC programme is the IAEA's primary mechanism for transferring nuclear technology to Member States, helping them to address key development priorities in areas such as health and nutrition. At NAHRES, we currently have 18 national, four regional and one interregional active TC projects. They mainly focus on micronutrients, infant and young child feeding practices and the first 1000 days, obesity and interventions, and infectious diseases and nutrition

(see below map). We are starting the preparations for a new TC Programme for the cycle 2022-2023 and are looking for interested groups with project ideas. To discuss potential project ideas, please contact your IAEA National Liaison Officer (NLO) in the country, or NAHRES (nahres@iaea.org) in case you don't know who your NLO is. More information on the use of stable isotopes in nutrition programmes and concrete steps to request project support can be found [here](#).



News

Application of stable isotopes to understand the effect of environmental enteric dysfunction on protein metabolism and health outcomes



Participants of the consultants' meeting. (Photo courtesy of IAEA)

In previous issues of the NAHRES Newsletter we have reported on work focusing on the use of a stable isotope-based breath test to diagnose Environmental Enteric Dysfunction (EED). It is linked to stunting in children and an acquired subclinical condition of the small intestine characterized by its abnormal morphology and physiology, with mucosal inflammation, villous blunting, altered barrier integrity, and reduced intestinal absorptive capacity. It is known that stunted children often have lower serum concentration of all essential amino acids. However, whether EED plays part in this, is unknown. It is also not fully understood whether supplementation with high quality protein or essential amino acids can 'heal' EED.

A consultants' meeting convened in Vienna by the IAEA from 9-11 September 2019 brought world renowned experts in the field of protein metabolism and EED together to review current evidence on the link between EED and protein metabolism and advise the IAEA on a potential research agenda on this issue and how stable isotopes can help. The seven consultants from France, Jamaica, India, UK, USA, Thailand, and Denmark identified the need to focus on sulfur containing amino acids as emerging evidence suggests that they may be more implicated in stunting and severe acute malnutrition and could potentially drive EED. They proposed that intervention studies informed by animal modelling be conducted to provide data on the best suite of essential amino acids to treat EED and leveraging stable isotope techniques developed in current IAEA research projects, namely, the ^{13}C -Sucrose Breath Test for EED diagnosis and the Dual Tracer Isotope Technique for assessment of protein digestion. This information, if successfully generated could potentially contribute to global efforts to update and develop recommendations on protein requirements, especially for young children.

**Attend our symposium at the Micronutrient Forum 5th Global Conference 2020
Bangkok, Thailand**

Title: Using the retinol isotope dilution (RID) method to assess the efficacy, effectiveness and safety of vitamin A interventions

Thursday, 26 March, from 5:30-7:00 pm

The objectives of the symposium are to explain the use of the RID technique for the assessment of vitamin A status across the whole spectrum – from deficiency to toxicity, to describe the validity of the RID technique in populations and individuals with inflammation, to summarize new biomarkers to help identify population subgroups exposed to high intakes of vitamin A, and to consider potential policy and programme implications. If you have the opportunity, join us and be part of interesting discussions.

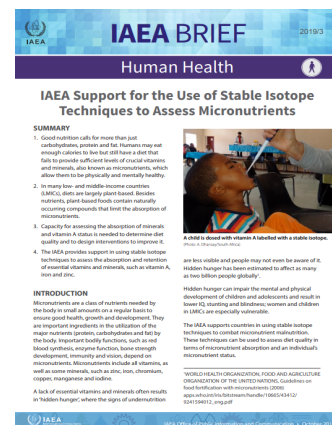
Publications

Perspective: Creating the evidence base for nutritional support in childhood cancer in low- and middle-income countries: priorities for body composition research

There are emerging data that malnutrition, as reflected in body composition changes, impacts survival of cancer. However, not enough priority is given to nutrition management of children with cancer, particularly in low- and middle-income countries (LMICs). The primary purpose of this [article](#) is to review current knowledge on childhood cancer and body composition in LMICs and to identify priorities for future research into the interlinking associations between cancer, body composition, and clinical outcomes for childhood cancer patients.

IAEA Support for the Use of Stable Isotope Techniques to Assess Micronutrients

A new [IAEA Brief](#) on the use of stable isotope techniques to assess micronutrients is now available. The IAEA provides support in using stable isotopes to measure absorption of minerals such as iron and zinc, and vitamin A status. This generates important information that can help to tackle micronutrient malnutrition.



Success stories

Toolbox to measure body fatness in children expanded in the European region

After four challenging years, the first IAEA-TC supported nutrition project in the European Region (RER/6/034) has come to an end. The final coordination meeting was held in Greece in December 2019. Some people have the impression that malnutrition is not a problem of Europe. While the rates of undernutrition may be small in most European countries, rates of childhood overweight and obesity are high. Overweight is a form of malnutrition that can contribute to non-communicable diseases (NCDs) such as cardiovascular diseases and diabetes. In 2014, WHO estimated that every third 11-year-old child in the European Region was overweight or obese. This calls for action! Improving dietary habits and limiting sedentary behavior could be among the solutions. To verify the effect of such initiatives, good monitoring systems and accurate methods are needed. This is where the deuterium dilution technique to assess body composition can be very useful. Interventions should make overweight children lose fat, not lean mass. Therefore, public health professionals from ten

countries in South- and Eastern Europe (Albania, Bosnia & Herzegovina, Greece, Hungary, Latvia, Montenegro, Moldova, North Macedonia, Portugal, Ukraine) set out to establish the deuterium dilution technique four years ago to strengthen the prevention of NCDs. But first and foremost, parents, children, health and education systems need to realize that there is a problem. Better data showing that a chubby child is an unhealthy child who has a higher risk of developing chronic diseases as an adult can facilitate that process. This is where the public health professionals in Europe still have a big task – and several of them have now a stable isotope technique in their toolbox.



Success stories

Not all food proteins are equal: how nuclear techniques help to understand protein quality in low- and middle-income countries

Protein quality refers to the ability of the protein, when eaten in the required amount, to meet the daily indispensable amino acid (IAA) requirements. The latter have been shown to be 2 to 3 times higher than previously thought. Therefore, the quality of the protein is an important factor for a healthy diet. If a diet has low quality protein, then more protein has to be consumed to make up for the inferior quality. In order to set new recommendations for protein requirements for all age groups, the Food and Agriculture Organization (FAO) is seeking standardized data using the Digestible Indispensable Amino Acid Score (DIAAS), a newer recommended indicator for protein quality. An IAEA-supported CRP has provided the first set of data on amino acid digestibility in humans from plant foods.

DIAAS measures truly absorbed amino acids at the ileal level in the intestine and is not influenced by potential synthesis of amino acids by bacteria in the large intestine. Agricultural and nutritional scientists participating in this CRP have developed and tested a novel dual tracer isotope method that can successfully and minimally invasively measure ileal IAA digestibility in humans. This will inform the DIAAS evaluation of different proteins. Results from this CRP were shared by the seven participating LMIC countries (Brazil, India, Jamaica, Mexico, Morocco, Pakistan and Thailand) in a meeting in Vienna from 3-6 September 2019.



Participants of the consultants' meeting. (Photo courtesy of IAEA)

Combating childhood obesity in Jamaica by strengthening nutrition assessment capacity



A trainee carries out an FTIR test to analyze saliva samples. (Photo courtesy of IAEA)

Jamaica is facing a growing obesity epidemic in children: according to the 2017 Global School-based Student Health Survey, the obesity rates in boys almost doubled from 5.3% to 10.3%, while obesity in girls rose from 6.7% to 9.9% since 2010. This trend is alarming because obesity in childhood is a major risk factor for developing diet-related chronic NCDs later in life. For an obesity prevention strategy to be successful, data related to early life nutrition must be available. Unfortunately, little relevant data on the nutritional status of children during this critical phase of life was available in Jamaica, making the design of intervention strategies challenging.

In 2016, a two-year IAEA TC project was launched to support the development of new capacities in health professionals from the Tropical Metabolism Research Unit (TMRU). This project (JAM/6/013) has strengthened their ability to accurately measure different forms of malnutrition, to understand risk factors associated with NCDs and to monitor nutrition interventions with the aim of preventing or treating malnutrition. Today, the TMRU is the regional nutrition resource laboratory for the Caribbean. IAEA support has helped to strengthen and expand the tools and resources available to Jamaica and the other Caribbean Member States in their bid to reduce the incidence of obesity and the burden of NCDs.

Check out the [flyer](#) for more facts and figures about this project.

NAHRES Special

Follow-up: International Symposium on the Double Burden of Malnutrition

In December 2018, the IAEA, jointly with UNICEF and WHO, organized the International Symposium on Understanding the Double Burden of Malnutrition (DBM) for Effective Interventions in response to an increasing DBM epidemic and within the context of the United Nations Decade of Action on Nutrition 2016-2025.

The outputs of the symposium are now available. They summarize the discussions and outline ways to better tackle the DBM. The symposium [report](#) highlights the key messages of all sessions and side events, a [brochure](#) gives an overview of opportunities to reduce the DBM synthesized from the discussions during the symposium, and the [proceedings](#), published as special issue in the *Annals of Nutrition and Metabolism* highlight in thirteen papers the preconception period and the first 1000 days of life, accurate assessment of different aspects of the DBM, regional examples of programmes and policies, ways to bridge from biology to implementation and research gaps.

The symposium outputs have been highlighted in the news section on the websites of the [IAEA](#), [Sight and Life](#) and [UNSCN](#). Check them out, together with the symposium [website](#) for more information including the recorded livestream.



Series from the Lancet journals

[View all Series](#)

The Double Burden of Malnutrition

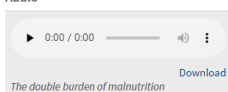
Published: December 16, 2019

Executive Summary

The double burden of malnutrition is the coexistence of overnutrition (overweight and obesity) alongside undernutrition (stunting and wasting), at all levels of the population—country, city, community, household, and individual. This four paper Series explores how this coexistence is affecting low-income and middle-income countries. Malnutrition in its many forms has previously been understood and approached as a separate public health issue, but the new emergent reality is that undernutrition and overnutrition are interconnected and, therefore, double-duty actions that simultaneously address more than one dimension must be implemented for policy solutions to be effective. In addition to policy recommendations, the Series includes a focus on both historical and biological contexts, and new economic analysis.



Audio



The double burden of malnutrition

Editorial

Coinciding with the publication of the symposium proceedings, a new [Series on The Double Burden of Malnutrition](#) was launched in *The Lancet* last month. This Series explores how the coexistence of overnutrition (overweight and obesity) and undernutrition (stunting and wasting) is affecting low- and middle-income countries. The Series' focus is on both historical and biological contexts, new economic analyses and policy recommendations on double duty actions. A comment includes a call for a new nutrition manifesto for a new nutrition reality.



Panellists during the opening session of the symposium. From left to right: Ms Cornelia Loechl, Mr Clemens M. Auer, Ms France Begin, Mr Aldo Malavasi, Mr Laurence Grummer-Strawn and Ms May Abdel-Wahab. (Photo courtesy of D. Calma / IAEA)

NAHRES Special - UNSCN

Nutrition and Food Systems at the Climate COP in Madrid

With special thanks to S. Oenema, UNSCN Secretariat

Hosted by the Chilean Government, the Climate Conference of Parties (COP) took place in Madrid from the 2-13 December 2019. The UN System Standing Committee on Nutrition (UNSCN) participated in several events during the COP. Not all of you will immediately think of nutrition at such an essential meeting, which focuses on addressing climate change worldwide. Indeed, nutrition nor food systems were part of the COP negotiations. However, up to 30% of the greenhouse gases are caused by the food we produce, process, transport, market and consume. That was the message UNSCN brought forward, along with a very limited group of other actors. UNSCN promoted the idea that transforming our food systems to enhance sustainability can benefit our planet, by reducing greenhouse gas emissions and enhancing biodiversity, clean water and soils, but also the health of people - now and in the future.

Based on UNSCN's discussion paper '[Sustainable diets for a healthy planet and healthy people](#)' as well

as on the recently published [FAO/WHO guidelines for Sustainable Healthy Diets](#), the UNSCN coordinator Ms Oenema called for a transition towards more plant-based diets and more diverse production systems which preserve biodiversity and minimize the use of fossil-based fertilizers. The shift towards more plant-based diets is an achievable win-win situation: it protects health and the environment.

The COP in Madrid did not provide much room for a more ambitious agenda that included food systems in the discussion. It was primarily tuned towards the implementation and financing of the Paris Agenda. There is good hope that the COP in November 2020 in Glasgow, UK, will provide opportunities for a greater number and a greater diversity of ambitions.

Including food systems and nutrition in the agenda and acknowledging the important contribution of the food we produce, eat and waste to climate change, is an essential step towards achieving change and the protection of our planet, and our health.

An Intern's perspective

With a master's degree in Clinical Nutrition, but without having a clue of what nuclear techniques have to do with this field, I joined NAHRES as an intern in February 2019. It has been a very challenging and at the same time rewarding year. I was lucky to be part of a very friendly, helpful and professional team, from whom I've learnt a lot about nuclear techniques and its applications in human nutrition. This internship has been full of learnings from the very first day. From the compilation of the newsletters and updates of our photo database to the preparation of meetings and statistical reports and the design of a face-to-face training on the use of stable isotopes to assess body composition, there has not been a day where my job didn't challenge me to do better and continue learning.

As an intern at the IAEA, I have also had the opportunity to meet very inspiring people with very different backgrounds, which has helped me to

improve my intercultural and communication competences. Another great aspect of being an intern in the Division of Human Health is being part of a bigger and integrating community of interns, where we share experiences, organize multicultural events, discuss about trending global topics, go out for lunch or even travel together. Now that my internship comes to an end, I am very grateful for having had this opportunity and I am looking forward to continuing my career in the field of human nutrition.



NAHU Interns. (Photo courtesy of D. Gómez)

Puzzle corner

Below, 10 concepts with missing letters are listed. All concepts were mentioned in the newsletter and are of importance in the nutrition world. Can you find out which ones they are?



1. ___ O D ___ C ___ P O ___ I O ___
2. H ___ L ___ Y W ___ I ___ H ___
3. ___ T ___ T ___ O ___ A L S ___ P P ___ R ___
4. C A ___ I ___ A ___ U ___ R D ___ S E ___ E ___
5. E ___ I R ___ N ___ E ___ T ___ N ___ E ___ C D ___ S F ___ T ___ O ___
6. ___ M ___ N ___ A ___ I ___ D ___ E S ___ B ___ T ___
7. C ___ I ___ H O ___ D O ___ I T ___
8. M I ___ O N ___ T R ___ N ___ S E ___ E N T
9. E N ___ G ___ E X ___ D ___ R ___
10. S ___ A ___ L ___ S ___ O ___ E ___

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

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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

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