



IAEA

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Nutritional & Health-Related Environmental Studies Newsletter

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To our readers

Dear all,

Happy New Year! We hope that you have had a rewarding festive season and started the New Year full of energy for new activities!

We managed to recharge our batteries after the symposium and are now reaching out to you with our January newsletter. Of course, the symposium is still very much present for us since we are busy with the follow-up. We have devoted a section to share some of the exciting symposium highlights and statistics! If you are on social media keep using the #DBMAL for double burden of malnutrition related tweets.

Besides the symposium, other meetings and training courses have taken place in the second half of 2018. You will find summaries in this newsletter. Read about the IAEA contribution to the 8th African Nutritional Epidemiology Conference and the new research project on childhood cancer! Our new database on doubly labelled water was launched and other documents and articles were published – check out the details! Don't miss the encouraging news from Seychelles and the UNSCN contribution on the future of food systems!

We had to say good-bye to Caroline, who helped us with data analysis from September to December. We wish her all the best for her next endeavours.

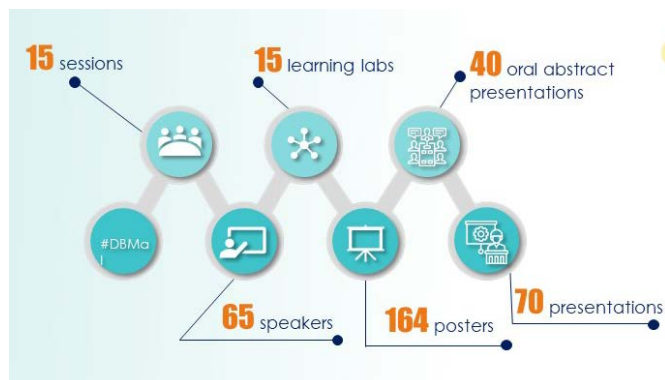
Best wishes,
Cornelia



International Symposium on Understanding the Double Burden of Malnutrition for Effective Interventions

Finally, after a year of planning, the [International Symposium on Understanding the Double Burden of Malnutrition for Effective Interventions](#) took place from 10-13 December 2018 at the Vienna International Centre and we would like to share some of the exciting things that happened!

Who and what? More than 460 scientists, health and nutrition professionals, policy makers and representatives from academia, international organizations, non-governmental organizations and civil society attended the symposium. In addition, a large number of enthusiasts followed the event via livestream. It was the first time that the IAEA, World Health Organization (WHO) and United Nations Children's Fund (UNICEF) joined forces for a major symposium. The scientific programme was packed with exciting activities for the participants varying from plenary sessions, poster and oral presentations to learning labs!



Focus. The double burden of malnutrition (DBM) connotes a complex situation where food insecurity, micronutrient deficiencies, undernutrition and infectious diseases, as well as overweight, obesity and related non-communicable diseases (NCDs) coexist in countries, communities and households, and even in the same individuals. The symposium focused on how the wealth of knowledge on biology and assessment methods may inform effective interventions and policies. Participants had the opportunity to listen to and discuss the latest developments in the field (first 1000+ days, undernutrition, obesity and food systems) and participate in interactive educational activities where new technology was demonstrated.

This symposium served as a platform for Member States to share experiences and learn about new assessment tools to measure malnutrition in all its forms and how to assess the impact of interventions with tools such as stable isotopes. The event created a timely opportunity to discuss and identify concrete actions for the achievement of nutrition commitments within the context of the UN Decade of Action on Nutrition.

Nuclear techniques. The role of stable isotope techniques in understanding biological pathways and in assessing the impact of programmes and initiatives targeting the DBM was emphasized. Stable isotope techniques can be used to accurately assess various forms of malnutrition and provide data to design or improve health and nutrition programmes. The IAEA's work that fosters the use of stable isotope techniques and building capacity within Member States was reinforced with the launch of the IAEA [Doubly Labelled Water \(DLW\) Database](#). Through sharing of data on energy expenditure, the database will help countries to devise better health policies to combat the growing obesity epidemic worldwide. We would like to encourage our readers to visit the webpage (check

Learning Labs gave participants opportunities to build skills and ask critical questions on special measurement techniques related to body composition, anthropometry or dietary assessment and to interact with developers of new low-cost technologies using 3D imaging to estimate body composition and body length.



Participants at the NAHRES-booth during the Symposium. (Photo courtesy of IAEA)

Did not have the chance to attend the Symposium? No problem, as the [nutrition section](#) of the IAEA's Human Health Campus includes pictures and links to the recorded video stream of the sessions! Speaker's presentations, symposium materials and articles can also be found at the link. Do keep an eye on the site as more materials including the Symposium Proceedings (planned to be published by mid-2019 in a peer-reviewed scientific journal), will be included there!

DBMal on the NAHRES Human Health Campus

Check the symposium material on our informative resource website for health professionals

- Just click on the photo below



"Next to climate change, the food crisis is the largest humanitarian crisis we have."

Clemens Auer, Special Envoy for Health of the Austrian Federal Ministry of Labour, Social Affairs, Health and Consumer Protection.

Thank you! The NAHRES team would like to acknowledge the contributions of WHO and UNICEF as cooperating partners of this symposium. A big **THANKS** goes to the [Department of Technical Cooperation \(TC\) at the IAEA](#) for their generous contribution of travel grants. Thanks to TC, approximately 80 participants from more than 40 Member States got the opportunity to travel to Vienna for the symposium! Finally, we would like to **THANK**

and acknowledge the voluntary contributions made by the Bill & Melinda Gates Foundation, Sight and Life, United Kingdom Environmental Mutagen Society and the Wellcome Trust in addition to the Permanent Mission of the Republic of Italy, the Permanent Mission of the Republic of Indonesia, the Permanent Mission of the United States of America and the Swiss Federal Office of Energy that supported the symposium. Thanks to these contributions we were able to fund almost 70 more participants from 30 Member States to attend the symposium.

Way forward? Over the course of the week, several key outcomes were identified by the participants including:



Building partnerships across disciplines and stakeholder levels

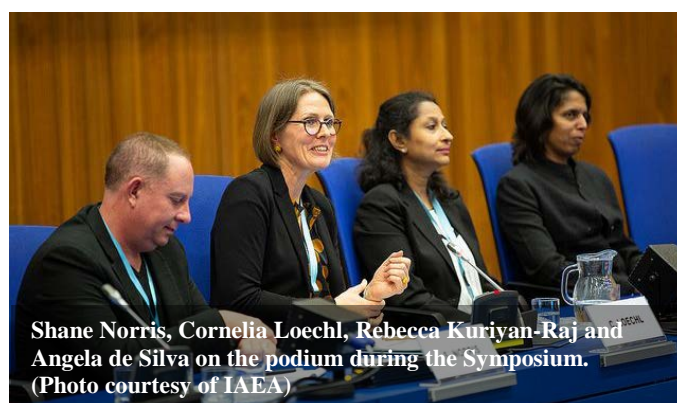


Demystifying nutrition for the public and other non-nutrition sectors



Engaging with youth to boost awareness

We hope it was not just another symposium, but that the energy built in the full conference hall during the four days will be transformed and released as action energy in the 21 organizations and 91 countries that were represented in the audience.



Shane Norris, Cornelia Loechl, Rebecca Kuriyan-Raj and Angela de Silva on the podium during the Symposium. (Photo courtesy of IAEA)

If you were there – we hope you were inspired and had the chance to talk to like-minded people, while creating new or reviving old contacts. And we also hope you have already started fighting the DBM step by step.

Meetings

Stable isotopes and the double burdens of disease and malnutrition: reflections from the 8th African Nutritional Epidemiology Conference

The 8th African Nutritional Epidemiology Conference held in Addis Ababa, Ethiopia from 1-5 October 2018 focused on how multi-sectoral nutrition actions can help translate evidence into policies for better programming and impact on reducing the double burden of malnutrition that the continent grapples with.

Africa has yet another double burden; infectious diseases that coexist with non-communicable diseases (NCDs). Non-communicable diseases are projected to overtake infections as the leading causes of death in the continent by 2030. What can be done to help the much-needed evidence for policy and action? NAHRES contributed to this discussion by way of two presentations delivered by Mr Victor Owino.

The first presentation discussed state of the art literature on the magnitude of diet-related communicable diseases and the driving factors and proposed a number of possible ways to respond. More importantly, the role of body fat as a risk factor for NCDs was discussed and the deuterium dilution method was proposed to measure it.

The second presentation focused on another stable isotope technique, the deuterium oxide dose-to-mother method, which was successfully used in South Africa and Kenya to show how breastfeeding practices in the context of maternal HIV-infection affect infant nutritional status and body composition. South African children who were exclusively breastfed for a longer time had more lean tissue. Kenyan children whose mothers were on anti-retroviral therapy had lower lean tissue. Check out more details in the related [web-article](#)!



Victor Owino presented at the 8th African Nutritional Epidemiology Conference. (Photo courtesy of IAEA)

62nd IAEA General Conference: Botswana shares results on body composition and anaemia among children living in malaria prone-areas

Botswana has benefited from IAEA's support since 2016 to develop national capacity for the evaluation of an iron supplementation programme using stable isotope techniques (BOT/6/007).

This project is firstly motivated by the high prevalence of stunting and anaemia among children below 5 years. Malaria is also endemic in most parts of Botswana. How infection affects iron status and growth in children has not been well understood.

Secondly, a government programme has been in place over the last three decades involving blanket supplementation of children from 6-36 months with a high energy-high protein porridge based on soybeans and sorghum. This food blend, popularly known as Tsabana, is fortified with several vitamins and minerals including iron. How the consumption of Tsabana affects children's iron status has hitherto not been evaluated.



Aldo Malavasi, May Abdel-Wahab, Victor Owino and Boitumelo Motswagole at the GC side event on infectious diseases. (Photo courtesy of Y. Yustantiana/IAEA)

With IAEA's support, Botswana through the National Food Technology Research Centre (NAFTEC) conducted a pilot study to assess the prevalence of iron deficiency anaemia among children receiving Tsabana, comparing low- and high-risk malaria areas. Deuterium dilution technique was used to measure body composition. The study found high rates of anaemia in high-risk malaria areas compared to low risk areas. Further, children in high malaria areas had greater inflammation markers and reduced iron stores.

Meetings

Iron supplementation interventions must adequately factor in infectious diseases, especially malaria. The results were presented by Ms Boitumelo Motswagole, Principal Nutritional Officer at NAFTEC, at a side event during the 62nd IAEA General Conference. More details on the event can be found [here](#).



Boitumelo Motswagole on the podium for the GC side event on infectious diseases (Photo courtesy of IAEA)

Interregional project (INT/6/058) using stable isotopes to improve the evidence base for stunting reduction programmes worldwide

A mid-term review coordination meeting of an interregional IAEA TC project (INT/6/058) that focuses on the use of nuclear techniques to evaluate stunting reduction programmes took place in Viet Nam from 5-9 November 2018. The 4-year project, which began in 2016, aims to improve the



Meeting participants of INT/6/058 in Viet Nam. (Photo courtesy of IAEA)

effectiveness of national nutrition projects to combat stunting by assessing breastfeeding practices and body composition of infants in twelve Member States, across the three regions of Africa, Asia and Pacific, and Latin America and The Caribbean. Many of the countries have started data collection and have promising initial results that will inform nutrition decision makers in their countries. Together, the team reviewed project progress and challenges encountered to date and agreed on work plans to be taken forward by Project Coordinators in their respective countries to complete the project.

COMING! New Coordinated Research Project on Childhood Cancer!

A Consultancy Meeting was held in December to discuss priorities for a new Coordinated Research Project on Childhood Cancer. The new project will open in 2019 for proposals that examine body composition and/or energy expenditure using nuclear techniques in childhood cancer patients in low-and-middle-income-countries. The proposals should aim to answer some key research questions on how cancer and treatment affects body composition and/or energy balance, how body composition affects clinical outcomes, or how interventions can improve body composition, energy balance and clinical outcomes.

For more information or to register interest, please contact Ms Alexia Alford
a.alford@iaea.org



Meetings

Training and educational activities are an important component of support offered to Member States. Two training courses and one educational workshop have taken place recently.

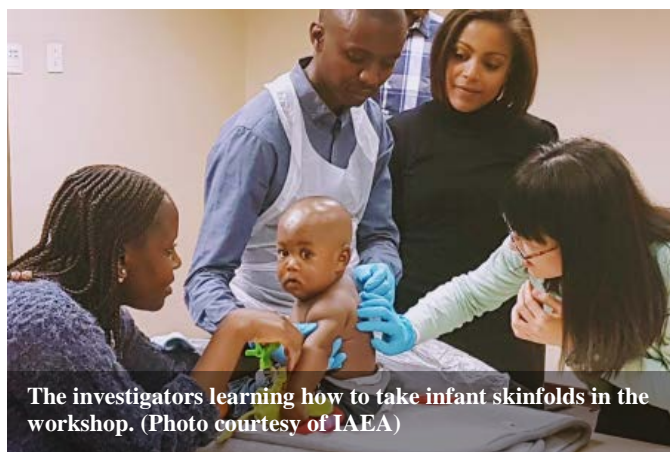
An educational workshop for a Coordinated Research Project on assessing body composition and anthropometry during pregnancy and infancy was hosted by Wits University in South Africa, with many thanks to the hosts, Ms Rihlat Said Mohamed and Mr Doug Momberg, and to the experts, Ms Grace Munthali and Ms Abby Altazan.



CRP investigators at the workshop in South Africa. (Photo courtesy of IAEA)

In Guatemala, thanks to the INCAP team for hosting an intensive training course for 13 countries involved in the new regional Latin American TC project (RLA/6/079) on anthropometry standardization for infants and the practical aspects of assessing deuterium enrichment in infancy.

In October, new Caribbean Member States were introduced to nuclear nutrition techniques at a workshop in Jamaica, gratefully hosted by the Caribbean Institute for Health Research and led by Ms Asha Badaloo and her team (RLA/6/079).

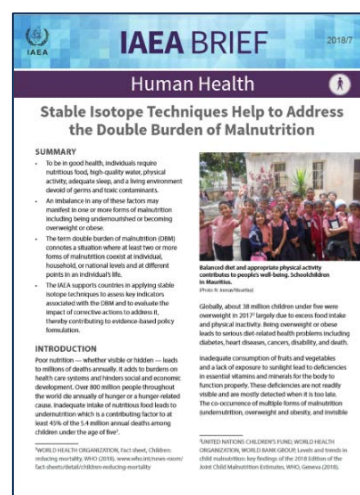


The investigators learning how to take infant skinfolds in the workshop. (Photo courtesy of IAEA)

New publications

IAEA Brief: Stable Isotope Techniques Help to Address the Double Burden of Malnutrition

The new IAEA Brief on Human Health summarizes the characteristics and challenges of the double burden of malnutrition and emphasizes the advantages of using stable isotope techniques for accurate assessments. To learn more about the double burden and IAEA's approach to tackle it, [download the full brief!](#)



IAEA Video: Improving Health with Atomic Precision in Mauritius

The nutrition transition and sedentary lifestyles paved the road for increased obesity worldwide, including in Africa. Among the African countries, Mauritius has one of the highest obesity rates. The close collaboration with the IAEA for using stable isotope techniques to fight obesity can help policy makers understand and improve nutrition.

If you are interested in IAEA's cooperation with Mauritius, watch the [full video!](#)



New publications

IAEA Doubly Labelled Water Database

The IAEA is hosting the Doubly Labelled Water Database of energy expenditure measurements collected using doubly labelled water. The IAEA DLW database currently contains over 6,600 measurements from 23 countries collected between 1981 and 2017. The database is open for submissions of DLW data to be included in the database. Individuals submitting data into the database will be acknowledged by being included as authors on any publications that use the database. There are many planned analyses that will benefit from the unique collection of data, including examining how energy expenditure is affected by age, ethnicity, body composition and lifestyle. Application for undertaking analysis on the pooled data in the database is also open. For more information on submitting data to the database or if you have an interest in analysing the data, please check the [website](#) for more information.



Assessment of Zinc Metabolism in Humans Using Stable Zinc Isotope Techniques

The newest edition of the Human Health Series continues IAEA's efforts to transfer technology and to contribute to capacity building in the assessment of zinc metabolism.

To better understand the absorption, dietary bioavailability and nutritional requirements of zinc, the publication provides the reader with:

- theoretical background information on stable isotope techniques to assess zinc metabolism
- practical application of state of the art methodologies
- role of zinc in human nutrition
- application of stable isotope techniques to evaluate nutritional interventions

You can purchase the hard-copy or [download the pdf-file](#) for free! Check also our new button on the Human Health Campus on [iron and zinc bioavailability](#)!



Body mass index vs deuterium dilution method in African children

A study recently published in the Bulletin of the World Health Organization has calculated the body mass index BMI-for-age using the WHO child growth standards and simultaneously measured body fatness using the deuterium dilution method, whereas excessive body fat percentage was defined as $> 25\%$ in boys and $> 30\%$ in girls.

The comparison of results revealed that even though (BMI)-for-age is a well-established indicator for surveillance of paediatric obesity, it can underestimate excessive fatness.

[Read the full paper](#) and check our related article in the NEW [Sight and Life Magazine focusing on the DBM](#)!.

New publications

IAEA's role in fighting micronutrient malnutrition

A review on IAEA's contributions to vitamin A, iron, and zinc research has been published recently in [Advances in Nutrition](#)!

The IAEA supports research and capacity building on the safe use of stable isotopes in global health and nutrition. Vitamin A isotopic techniques can be used to evaluate the efficacy and effectiveness of interventions. Stable isotopes of iron and zinc can help to determine mineral bioavailability and to measure efficiency of absorption of iron and zinc from fortified and biofortified foods.

Stable isotope methods are the most powerful techniques available for evaluating vitamin A status and provitamin A bioefficacy and iron and zinc bioavailability from meals. The article also highlights some of the work that the IAEA has supported over the past two decades on vitamin A, iron and zinc.

If you want to find out more, [read the full paper](#) or check out more details in the related [web-article](#)!



Isotope dosing in a school in South Africa. (Photo courtesy of South African Medical Research Council)

Use of Stable Isotopes to Evaluate Bioefficacy of Provitamin A Carotenoids, Vitamin A Status, and Bioavailability of Iron and Zinc

Jesse Sheftel, Cornelia Loechl, Najat Mokhtar, Sherry A Tanumihardjo

Advances in Nutrition, nmy036, <https://doi.org/10.1093/advances/nmy036>

Published: 11 August 2018 Article history

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Abstract

The ability of nutrition scientists to measure the status, bioavailability, and bioefficacy of micronutrients is affected by lack of access to the parts of the body through which a nutrient may travel before appearing in accessible body compartments (typically blood or urine). Stable isotope-labeled tracers function as safe, nonradioactive tools to follow micronutrients in a quantitative manner because the absorption, distribution, metabolism, and excretion of the tracer are assumed to be similar to the unlabeled vitamin or mineral. The International Atomic Energy Agency (IAEA) supports research on the safe use of stable isotopes in global health and nutrition. This review focuses on IAEA's contributions to vitamin A, iron, and zinc research. These micronutrients are specifically targeted by the WHO because of their importance in health and worldwide prevalence of deficiency. These 3 micronutrients are included in food

Success story

A nuclear technique helps Seychelles to identify key drivers of overweight and obesity in school children

According to the recent Global School-based Student Health Survey, one in every four Seychellois school children is overweight or obese. Since 2014 the IAEA has supported Seychelles to build capacity in the use of stable isotope techniques to generate evidence useful for design and evaluation of mitigating interventions. The first phase (2014-2016, TC project SEY/6/003) involved development of capacity in stable isotope techniques for nutritional assessments. The second phase (2016-2018, TC project SEY/6/004) supported a pilot survey among school children to determine the prevalence of obesity and the driving factors including body fat by deuterium dilution, physical activity levels by accelerometers and dietary patterns by recall.

Results were presented at a national dissemination workshop held in Mahé on 18 October 2018 to an audience of about 100 participants including senior government officials from the Ministries of Health, Education, Family and Social Welfare and other departments, WHO's country representative, parents, health practitioners and the media. Results showed that one in every two children aged 8-10 years had excess body fat primarily due to high consumption of sugar sweetened beverages and physical inactivity. This project has provided very useful information on body fat and physical activity levels beyond the routine data collected, such as the Body Mass Index. The workshop was covered by several local media including the [Seychelles News Agency](#).

The Nation Daily reported: 'Study shows alarming obesity in young children.' The capacity built, and lessons learnt will be applied in the next phase where the National Health Care Agency will implement a school-based physical activity and nutrition education programme in selected schools.



School in Seychelles. (Photo courtesy of IAEA)

NAHRES Special - UNSCN

The future of food systems

Stineke Oenema and Christine Campeau,
UNSCN Secretariat

Food systems are the method by which food travels from field to fork, including through breastfeeding. According to the High-Level Panel of Experts on Food Security and Nutrition (HLPE 2014), “food systems gather all the elements (environment, people, inputs, processes, infrastructures, institutions, etc.) and activities that relate to the production, processing, distribution, preparation and consumption of food, and the output of these activities, including socio-economic and environmental outcomes”. No food system is alike but all have the capacity to produce the food that is needed for good nutrition and human health. They also have the potential to reduce rural poverty, improve livelihoods and strengthen resilience, especially for marginalized populations. Unfortunately, however, current food systems deliver foods for unbalanced diets – either too low in essential (micro)nutrients or too high in sugars, fats and salt – and do so by environmentally unsustainable means. Therefore, food systems of the future need to be better equipped to respond to an ever-changing climate, respectful of limited planetary resources, adaptable to the transformation of urban and rural settings, and alert to competing vested interests, to name a few.

Aware of this urgent need, several actors are working together to set the stage for how best to shape sustainable food systems for healthy diets. UNSCN members [FAO](#) and [UN Environment](#) are working to help increase the understanding of food systems. FAO is currently developing their *Food Systems Framework* to support countries to develop strategies, policies and regulatory frameworks that promote efficient and inclusive food systems. UN Environment, in collaboration with the [10YFP Sustainable Food Systems Programme](#), is focusing specifically on the sustainability of food systems for their *Transformative Sustainable Food Systems Framework*. [IAEA](#) is also helping through their on-going efforts to measure malnutrition and assess the impact of interventions with tools such as stable isotopes. Recently, at IAEA’s [International Symposium on Understanding the Double Burden of Malnutrition for Effective Interventions](#), a session was held specifically to clarify the role of food systems in addressing the double burden of malnutrition and to find ways to respond to drivers, such as international and national politics, trade issues, and environmental concerns.

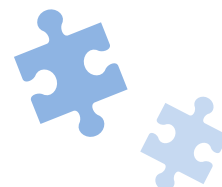
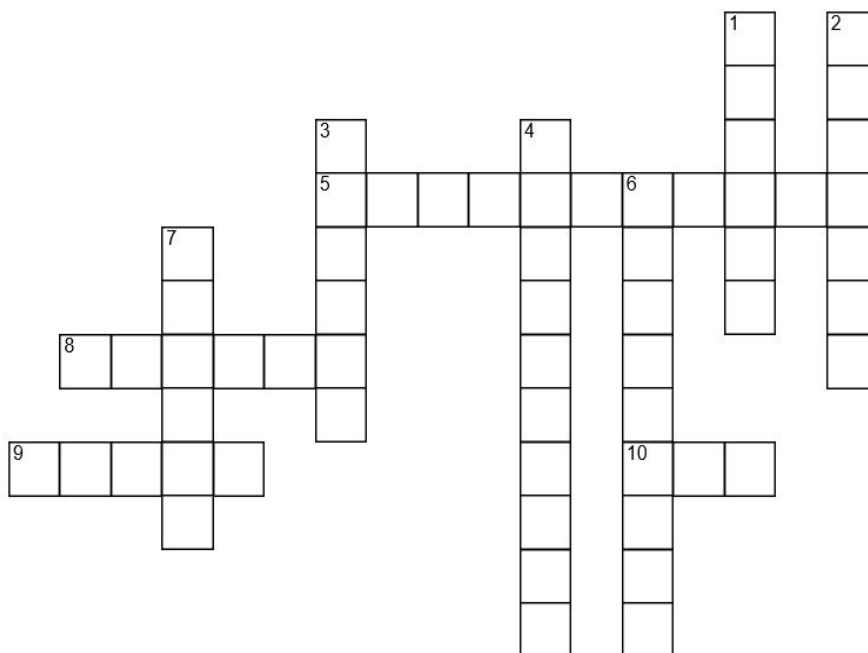


Participants of the panel on food systems at IAEA’s symposium on the double burden of malnutrition. (Photo courtesy of IAEA)



Stineke Oenema (right) chairing the panel on food systems at IAEA’s symposium. (Photo courtesy of IAEA)

Puzzle corner



DOWN

- 1 – Breastfeeding is an important _ and young child feeding practice.
- 2 – The coexistence of undernutrition and _ defines the double burden of malnutrition.
- 3 – Overweight people who simultaneously have micronutrient deficiencies suffer from _ hunger.
- 4 – More than 8 billion people from the global population are _.
- 6 – Dietary _ is essential for achieving an adequate intake of all essential nutrients.
- 7 – The last IAEA Symposium was organized in cooperation with the WHO and _.

ACROSS

- 5 – The double burden of malnutrition can exist within populations, _ and households.
- 8 – Breastfeeding is a good example of a _-duty action.
- 9 – Malnutrition in any form, affects about one in _ people globally.
- 10 – The WHO recommends exclusive breastfeeding for the first _ months of life.

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Feedback

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

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Impressum

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