

# Portfolio

## **Nutrition for Improved Health**

# Using Nuclear Science and Technology



The **mission** of the International Atomic Energy Agency's (IAEA's) programme on nutrition is to enhance your country's capabilities to combat malnutrition for better health throughout the life course.

Our **objective** is to support you in using noninvasive, accurate nuclear techniques (including stable isotopes) for nutrition assessments to plan, develop and evaluate nutrition interventions and inform national programming aimed at addressing all forms of malnutrition.

## THE IAEA'S STRATEGIC RESEARCH APPROACH:

- 1. Application of well-established nuclear techniques and nuclear-related methods to improve nutrition assessments.
- 2. Optimization and adaptation of existing nuclear techniques to enable their application in resource-limited settings and at a larger scale.
- 3. Development of new nuclear techniques to address current, emerging and complex nutritional issues.
- 4. A focus on the following areas to address current global needs:
- Early life nutrition;
- Prevention and management of nutritionrelated non-communicable diseases;
- Diet quality and nutrition security.

# HOW CAN THE IAEA HELP YOU TO COMBAT MALNUTRITION?

1. Deepening nutrition knowledge through Coordinated Research Projects

You can participate in nutrition research projects that the IAEA develops and coordinates to generate data for understanding complex nutritional issues, using nuclear techniques:

• Check for calls for proposals on the IAEA website to apply.

- You will receive a small annual grant, if your research institution is successful.
- You will also receive support on protocol development, collaborate with experts and participate in regular coordination meetings for progress assessment and knowledge sharing.
- 2. Providing educational support through the Human Health Campus

You can use the Campus as resource platform and consult important materials such as:

- Interactive IAEA e-learning modules to understand how various nuclear techniques can be used to measure nutrition outcomes including body composition, bone mineral density, total energy expenditure, breast milk intake and urea breath test for *H. pylori* diagnosis.
- IAEA guidance documents with detailed methodologies of IAEA-supported nuclear techniques in nutrition.
- 3. Building your institution's capacity through the Technical Cooperation Programme

You can address developmental challenges in your country through this programme which will transfer nuclear technology and strengthen your institution's capacity in the peaceful use of nuclear applications:

- Submit a project request, biannually, based on the development priorities of your country.
- The request may lead to national, regional and interregional projects mainly aimed at strengthening and building your institution's capacity to use nuclear applications.
- Sharing data to enhance global understanding of nutrition through databases

You can contribute your data on energy expenditure, human milk intake and body composition to the IAEA-hosted databases related to nutrition to increase representativeness. You can also request data for more in-depth analyses to inform new global perspectives on nutrition issues.

#### WHERE NUCLEAR TECHNIQUES CAN INFORM NUTRITION PROGRAMMING

#### First 1000 days

#### Body composition

Evaluating the success of interventions that manage undernutrition, overweight and obesity

### Breast milk intake and exclusivity of breastfeeding

Assessing the success of breastfeeding promotion interventions on exclusive breastfeeding rates

### Hidden hunger – vitamin A deficiency

Total body stores and liver concentration of vitamin A

Assessing vitamin A status in lactating women and optimizing the use of the isotope technique for larger surveys

#### **Infectious disease**

Presence of *Helicobacter pylori* in the stomach

Understanding how H. pylori infection impacts nutrient uptake and utilization in children

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# Double burden of malnutrition

#### Body composition

Validating simpler methods for assessing body composition (for use in larger surveys, clinics)

#### Obesity pandemic and diet-related NCDs\*

### Total energy expenditure

Understanding energy expenditure in light of the obesity pandemic and during cancer treatment

#### Added sugar intake

Developing new dietary biomarkers

#### **Healthy aging**

#### Bone mineral density and body fat distribution

Assessing NCD risk factors and bone health for the early identification of osteoporosis

# Diet quality and food systems

### Iron and zinc bioavailability

Evaluating the benefits of fortified and biofortified foods on micronutrient status

### Hidden hunger iron-deficiency anaemia

Iron long-term absorption and loss

Understanding iron metabolism in chronic inflammation and its impact on iron requirements

### Diet quality and gut health

## Protein and amino acid digestibility and gut function

Evaluating the effect of amino acio supplementation on the improvement of intestinal absorptive capacity

### **RECENT ACHIEVEMENTS AND FUTURE DIRECTIONS**

Infant body composition reference data

New dual isotope tracer technique to assess amino acid digestibility and evaluate protein quality

Breath test for assessing gut function (absorptive capacity)

Evidence of high vitamin A liver concentrations in children from exposure to multiple vitamin A interventions, highlighting the need for their scale down

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Develop protein and amino acid requirements in children

Generate data on breast milk intake and energy expenditure in key age ranges to bridge gaps in IAEA databases

Evaluate diet quality in changing food systems and of nutrient-dense underutilized crops

Understand the role of nutrition assessment and care in cancer treatment to improve clinical outcomes

Engage with us to address the future directions above!

To learn more about IAEA-supported nuclear techniques for nutrition, scan the QR code below and visit the Human Health Campus. Email us at nahres@iaea.org

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The IAEA's efforts will contribute towards:



2 ZERO HUNGER

**B** GOOD HEALTH AND WELL-BEING

