Tropentag, September 17-19, 2018, Ghent

"Global food security and food safety:
The role of universities"

Real-Time Dietary Assessment Using a Validated IT-Based Approach within a Ghanaian Setting

Julian Philipp Wald[1], Emmanuel Asare[1], Emmanuel Kweku Nakua[2], Christine Lambert[1], Hans Konrad Biesalski[1], Simon Riedel[3,1], Ute Gola[1], Donatus Nohr[1]

[1] *University of Hohenheim, Institute of Biological Chemistry and Nutrition, Germany*
[2] *Kwame Nkrumah University of Science and Technology, School of Public Health, Ghana*
[3] *ScienceDataServices, Germany*

Abstract

Meeting dietary needs represents a key element to guarantee food security. However, appropriate solutions for fast and precise assessments of dietary energy and nutrient intakes are still not available. This becomes particularly evident, if accurate pictures on individual-level must be generated. Therefore, this study illustrates the calculator of inadequate micronutrient intake (CIMI) approach: a programme evaluating dietary intakes in real-time based on individual dietary patterns.

Quantitative data on food consumption of adults in reproductive age and children under-five were obtained by a cross-sectional nutrition survey conducted in Southern Ghana. Food frequency questionnaire findings and food composition tables were used for the identification of region-specific food groups forming the basic structure of CIMI. Subsequently, the programme was validated by correlating and plotting results obtained through the analysis of 24h-recalls with CIMI and a standard nutrition software (NutriSurvey).

Pearson correlations ($r \geq 0.75$) and Bland-Altman plots (agreement limit: ± 1.96SD) indicate the comparability of the two dietary assessment programs and thus, the validity of CIMI. Due to the user-friendly data entry system consisting of region-specific food groups and the real-time survey analysis, CIMI proves to be fast while considering individual dietary patterns. For Ashanti region, diets were strongly characterised by the consumption of starchy staples (54 %), however, in comparison with the recommended nutrient intake (RNI) of the World Health Organisation (WHO), dietary needs were largely met in all sub-population groups. Virtually no dairy products were consumed, resulting in an overall poor dietary calcium intake (29.9±13.9 %RNI). In addition, generally low intakes of riboflavin were observed covering 72.4±42.3 % RNI. Dietary iron coverage of women had to be considered as inadequate (67.4±39.3 %RNI). Further data for Brong-Ahafo, Central and Eastern region are currently under analysis and will be presented at the conference.

A fast and precise IT-based approach for individual dietary energy and nutrient intake assessments was successfully developed and validated for a Ghanaian setting. As such, the programme represents a first step towards the collection of large-scale datasets on individual dietary intakes that will serve as a profound basis for stakeholders to recommend appropriate local food sources and proportions for improved diets.

Keywords: CIMI, dietary assessment, food security, Ghana, micronutrients

Contact Address: Julian Philipp Wald, University of Hohenheim, Institute of Biological Chemistry and Nutrition, Stuttgart, Germany, e-mail: julian.wald@uni-hohenheim.de