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Measuring Dietary Patterns Instead of Single Nutrient Intake: A Holistic Approach for Investigating the Nutritional Status of Women in Rural Tanzania

GUDRUN B. KEDING¹, JOHN M. MSUYA², MICHAEL KRAWINKEL¹

¹*Justus Liebig University Giessen, Institute of Nutritional Sciences, International Nutrition, Germany*

²*Sokoine University of Agriculture, Department of Food Science and Technology,*

Abstract

When investigating the complexity of human nutrition and its association with health, it is less meaningful to consider single nutrients, yet, much more sensible to create and analyse comprehensive dietary patterns. However, studies on dietary patterns were mainly carried out in industrialised countries so far.

Three semi-quantitative 24-hour recalls were conducted with 252 women in rural Tanzania during three different seasons within one year. From these recalls, the mean intake of twelve main food groups was calculated and used within a principal component analysis (PCA) to establish five dietary patterns. Additionally, individual intake of seven macronutrients, eight vitamins and seven minerals was calculated for each participant.

Overall, five different dietary patterns could be distinguished that were mainly characterised by the consumption of one or more specific food groups. The patterns were called (i) ‘traditional coast’; (ii) ‘purchase’; (iii) ‘traditional inland’; (iv) ‘pulses’; and (v) ‘animal products’. They showed differences between traditional and modern or changing nutritional attitudes, and also indicated that the early stage of the ‘nutrition transition’ is already taking place in rural Tanzania.

PCA factor scores were calculated for each participant for each food pattern that indicated the affiliation of a woman to a particular pattern. These scores were associated to certain health parameters and it could be shown that the more a woman was affiliated to the so-called “purchase” pattern, the higher was her body mass index (BMI) ($\rho=0.192$; $p = 0.005$). Furthermore, the higher a woman’s affiliation to the so-called “animal products” pattern, the higher was her haemoglobin (Hb) level ($\rho=0.216$; $p = 0.003$). In contrast, no meaningful associations between BMI or Hb and individual nutrient intakes could be shown. Thus, the generation of dietary patterns appears to be suitable to conclude on dietary habits and their consequences for health of women also in developing countries.

Keywords: BMI, dietary pattern, Hb, nutrient intake, nutrition transition, rural Tanzania, women