Development of a Photographic Food Atlas as a Portion Estimate Tool for Adolescents in Sri Lanka

H.M.N.J. Karunarathna[1*], W. A. H. S. Wickramaarachchi[1], T. Perera[1], K. D. R. R. Silva[1], R. M. T. K. Ranathunge[1], S.M.H.D. Sitisekara[1] and A. Gelli[2].

[1]Department of Applied Nutrition, Faculty of Livestock, Fisheries & Nutrition, Wayamba University of Sri Lanka, Makandura, Gonawila NWP, Sri Lanka;
[2]International Food Policy Research Institute (IFPRI), USA.

Corresponding author: nilminijayalathnaramana@gmail.com

Rationale/ Objectives

There is a gap in dietary intake data of adolescents in low and middle-income countries due to the low accuracy in portion sizes estimation of available dietary assessment methods. A food atlas is a set of food photographs portraying varying portion sizes of selected food items, that are bound together in a single volume that can be used to identify the portion sizes.

- This study aimed to develop a photographic food atlas with portion sizes of commonly consumed food in Sri Lanka for adolescents.

Methods

From 15 different food groups, 250 food items that are commonly consumed by Sri Lankan adolescents were prioritized.

Out of the prioritized food items, certain food items were cooked based on a standard recipe book while other items were purchased from the local market.

They were photographed using a smartphone with a 13-megapixel camera.

The photographs were taken from 90° angles to capture the aerial views and 45° angles to capture the view of a person, sitting at a table and looking at a plate on the table in front of him, respectively.

Series of six, four, and two portion sizes were used.

White color crockery with a gray color background was used to present the food items.

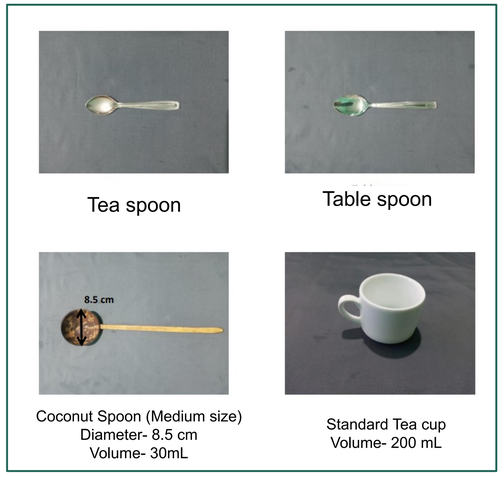

Figure 1: Different household measurements used to estimate the portion sizes of foods

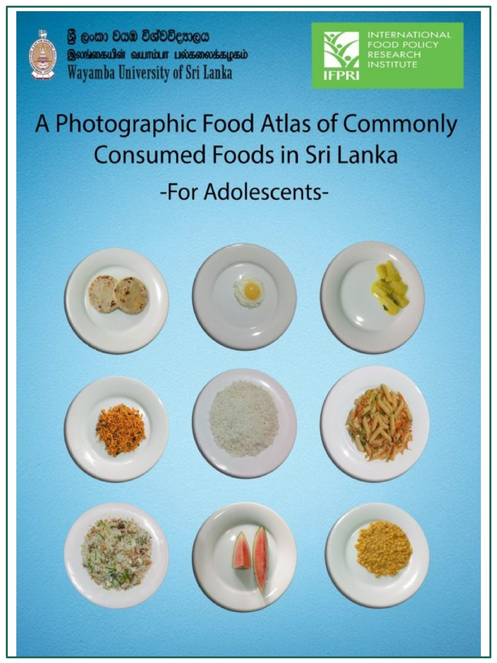

Figure 2: Developed food atlas

Results

- A total of 250 food items with different portion sizes (6 portion sizes (n=138 foods), 4 portion sizes (n=68 foods), 2 portion sizes (n=14 foods), and single foods (n=30 foods)) that are commonly consumed by Sri Lankan adolescents were depicted in the Food Atlas.

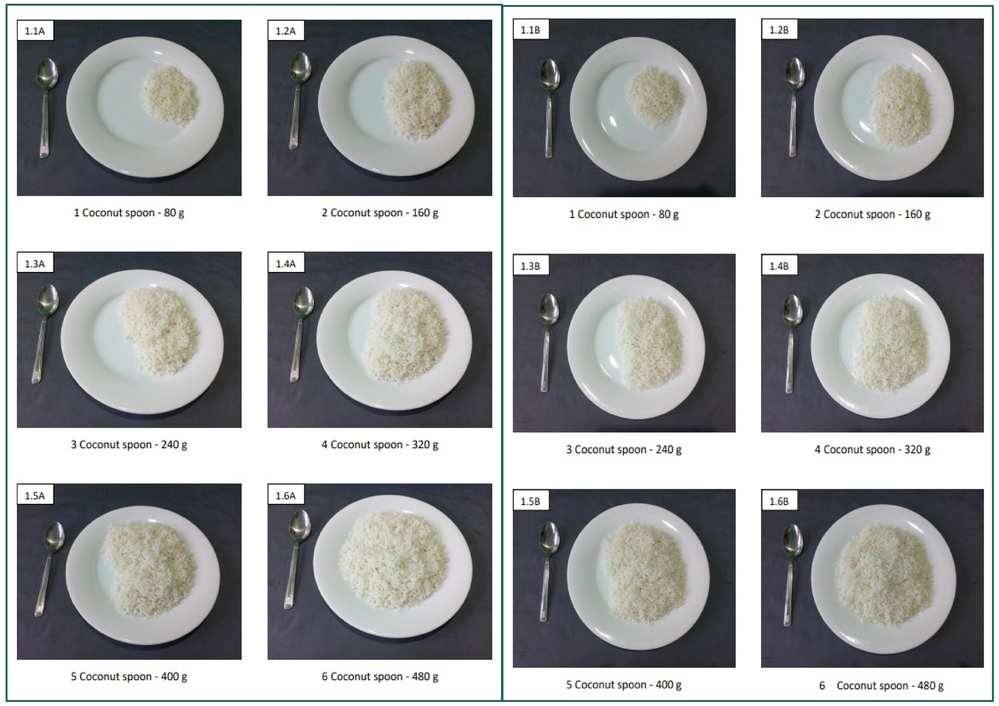

Figure 3: (A) Series of 6 photographs representing 45° angle view of portion sizes of cooked white rice. (B) Series of 6 photographs representing 90° angle view of portion sizes of cooked white rice.

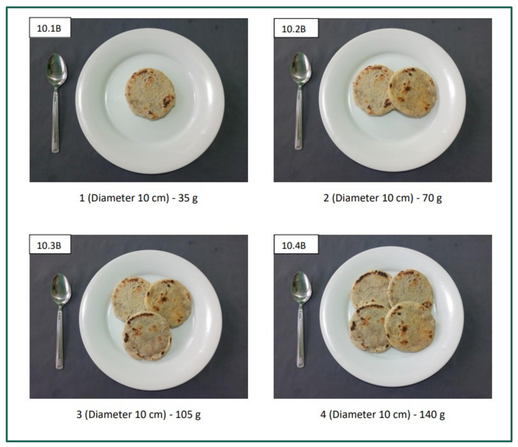

Figure 4: Series of 4 photographs representing 90° angle view of portion sizes of coconut roti

Figure 5: Series of 2 photographs representing 90° angle view of portion sizes of salted popcorn

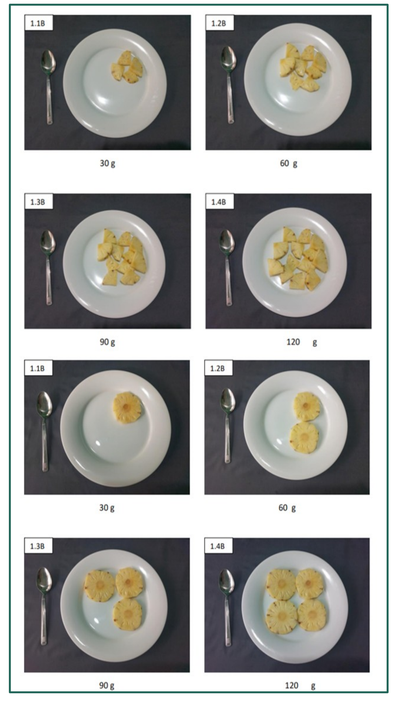

Figure 6: 90° angle view of portion sizes of Pineapple based on different cutting methods

- Fruits were represented with different cutting methods to increase the accuracy of portion size estimation.
- Both ascending and descending order of portion size representations were used to minimize respondent bias.

Figure 7: Representation of descending order of 90° angle view of portion sizes

Implications

- This colored, digital and photographic Food Atlas will be a valuable tool for accurately estimating portion sizes of the most common dishes consumed by adolescents in Sri Lanka.
- It can be used in educating, and counseling on appropriate portions of food to help improve the dietary intake of adolescents in Sri Lanka.
- Further research is warranted to validate the developed photographic food atlas to use as a tool for accurately estimating portion sizes in dietary assessments.