

Adventist Health, Lifestyle and Environmental Study in Argentina (AHLESA): Development and validation of instruments and tools for data collection

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Introduction

The AHLESA is a study carried out by a joint collaboration of researchers from the Universidad Adventista del Plata and Loma Linda University within the framework of the Grants for Research and School Partnerships International (GRASP-Intl) program. The first stage of the study sought to establish the basis for an interventional longitudinal study, the Adventist Health Study in Argentina.

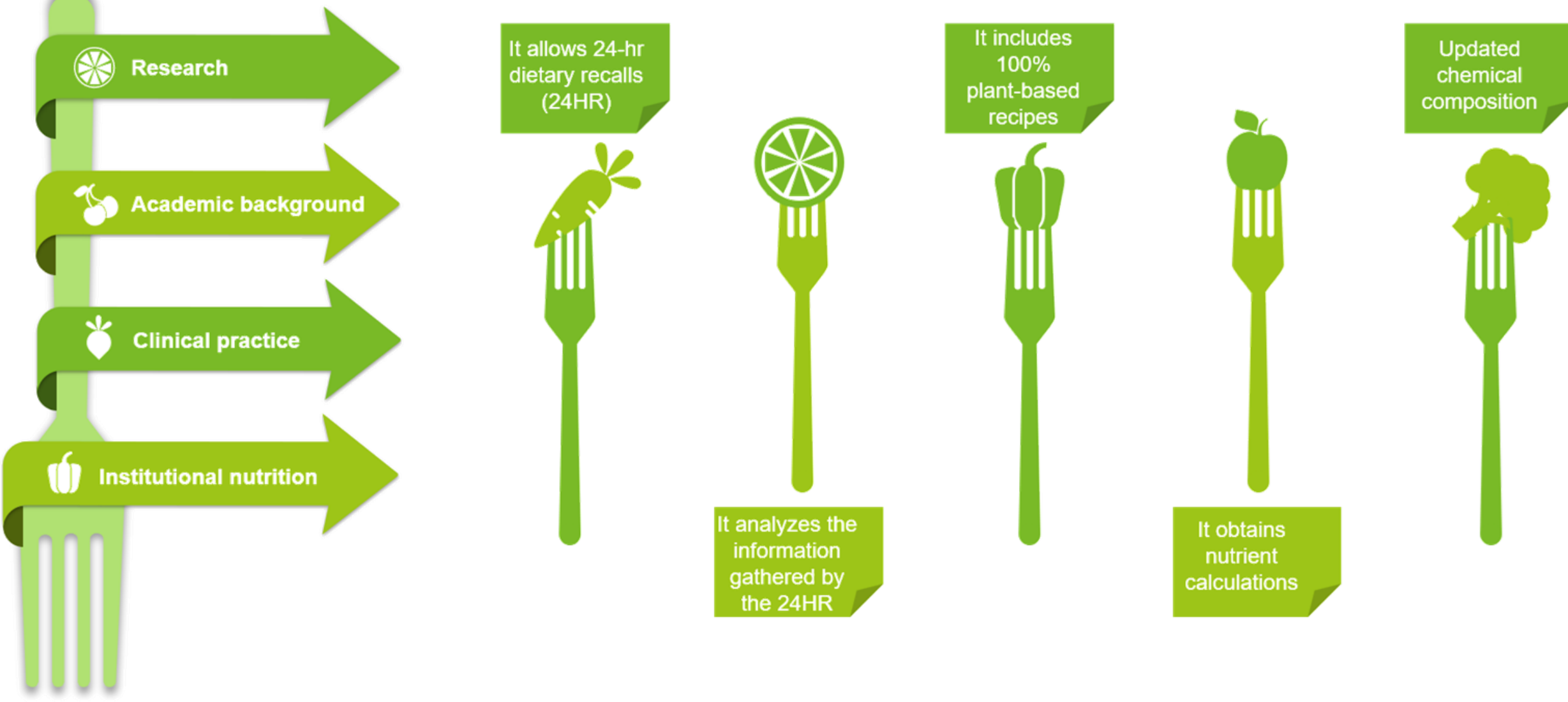
The main objective of AHLESA is to assess health-related lifestyle habits of Argentinian adults attending Adventist institutions (churches, schools, hospitals and health clinics) throughout Argentina. Data to be collected will include:

- ❖ Non-communicable diseases and their risk factors
- ❖ Omics (metabolome and microbiome)
- ❖ Environmental impact of food choices

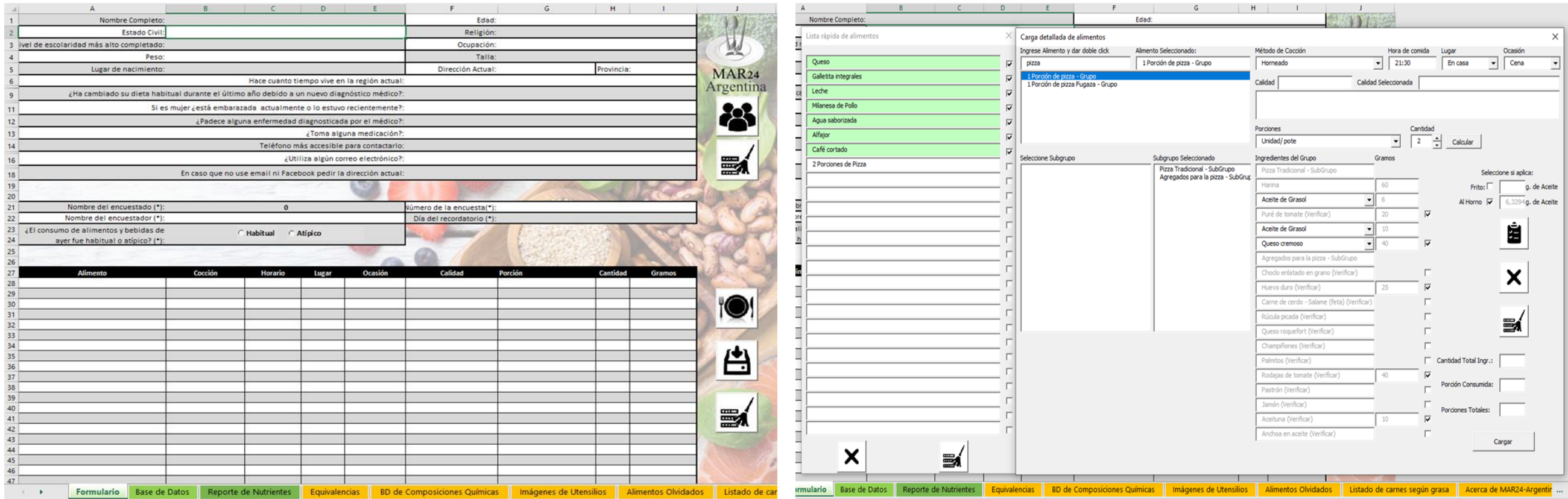
24HR Automated Tool

- A 24-hour dietary recall (24HR) automated tool, named MAR24, was developed based on 1,285 24HR conducted on male and female participants aged 18 to 68 years from the six Argentinian geographical regions.
- The tool integrates the 5 steps of the Automated Multiple-Pass Method (AMPM) of the USDA for the application of 24HR.
- The main structure and interface of the tool were designed using Visual Basic for Applications programming language in Excel Microsoft Office 365. The tool is the first automated 24HR using the AMPM approach in Argentina.

Uses and Advantages of MAR24-Argentina



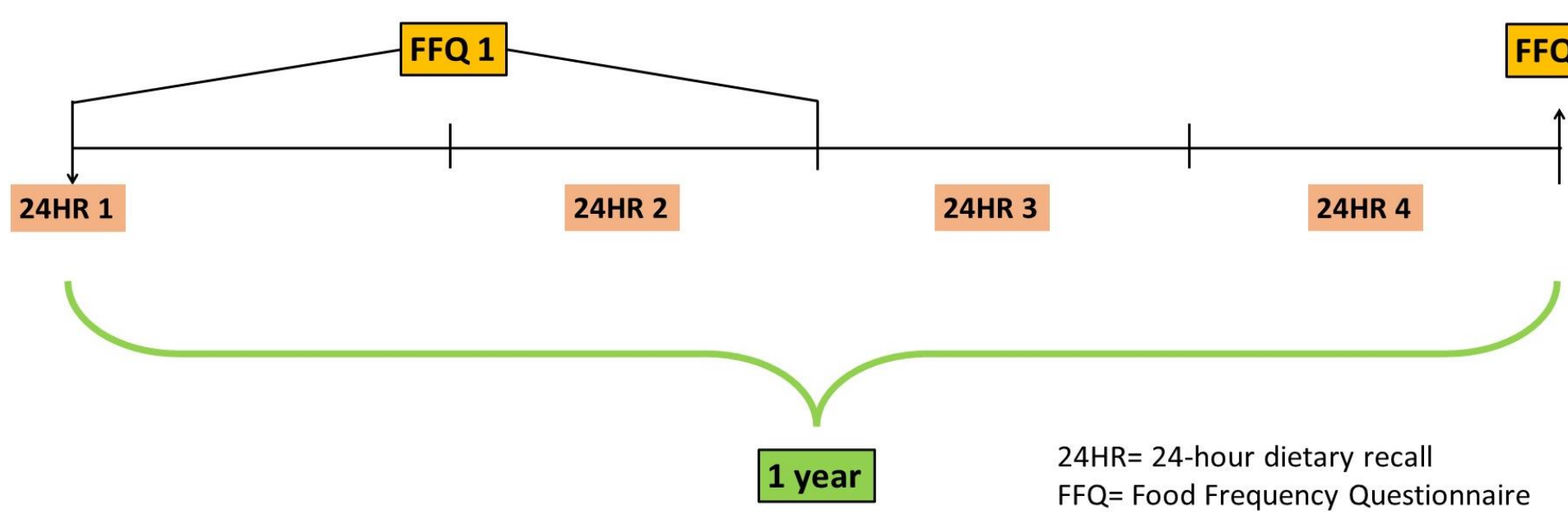
MAR24 interfaces



- The MAR24 database includes 968 foods, 100 recipes that represent foods and recipes from Argentina's six regions, and 50 nutrients and other food components.
- The food database uses local names for food and recipes, a visual aid for portion size estimation, and is no-cost and freely accessible to researchers and health professionals.
- MAR24 may be used to optimize dietary data collection and nutrient consumption analyses in clinical practice and clinical trials for monitoring purposes, and validation of food frequency questionnaires (FFQ) for nutritional epidemiology studies.

FFQ Validation

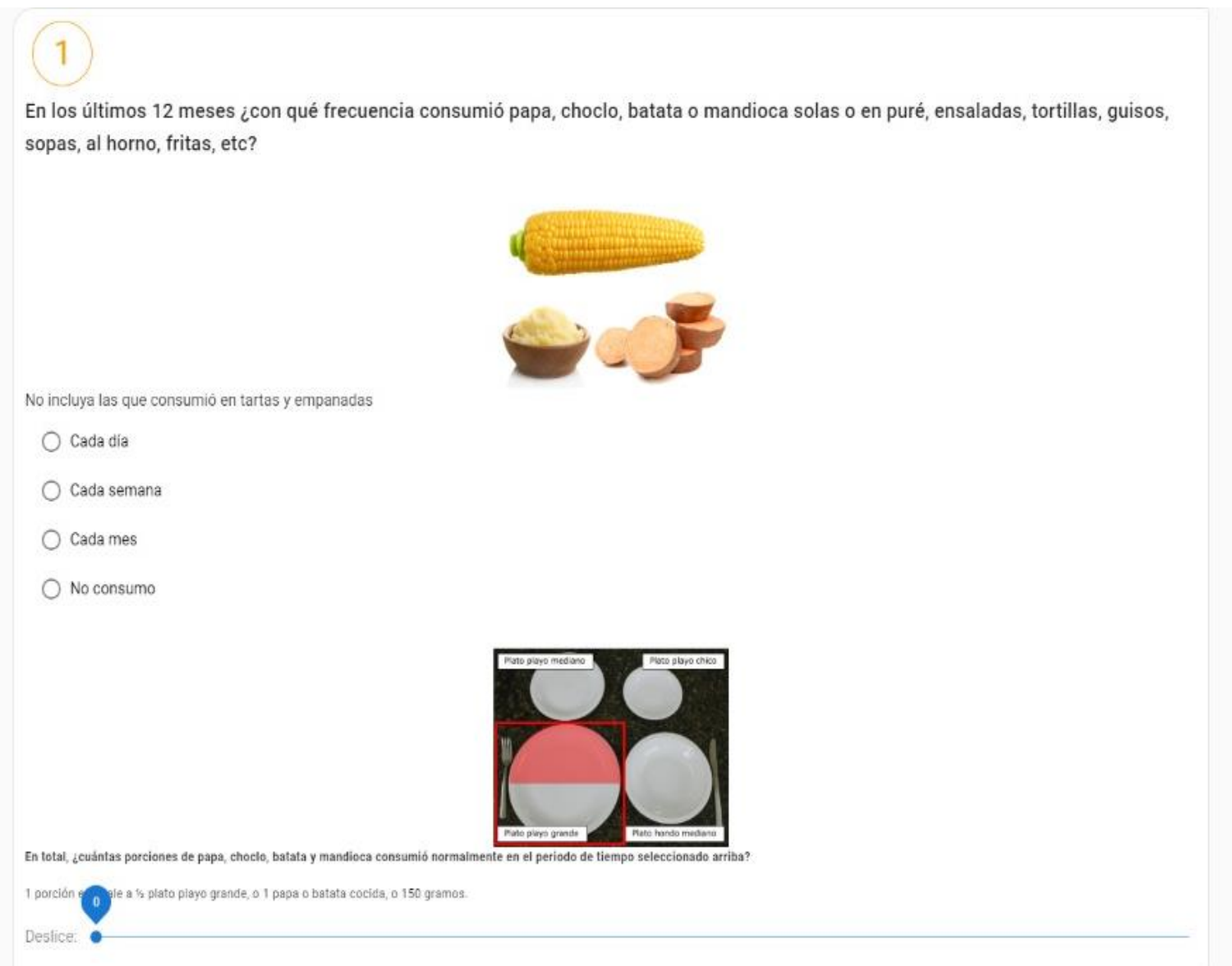
A food frequency questionnaire (FFQ) was developed and validated for Argentinian adults attending Adventist institutions in Argentina. A total of 163 persons were included in this stage.



The relative validity and reproducibility of the FFQ was evaluated and the instrument was validated for the following nutrients:

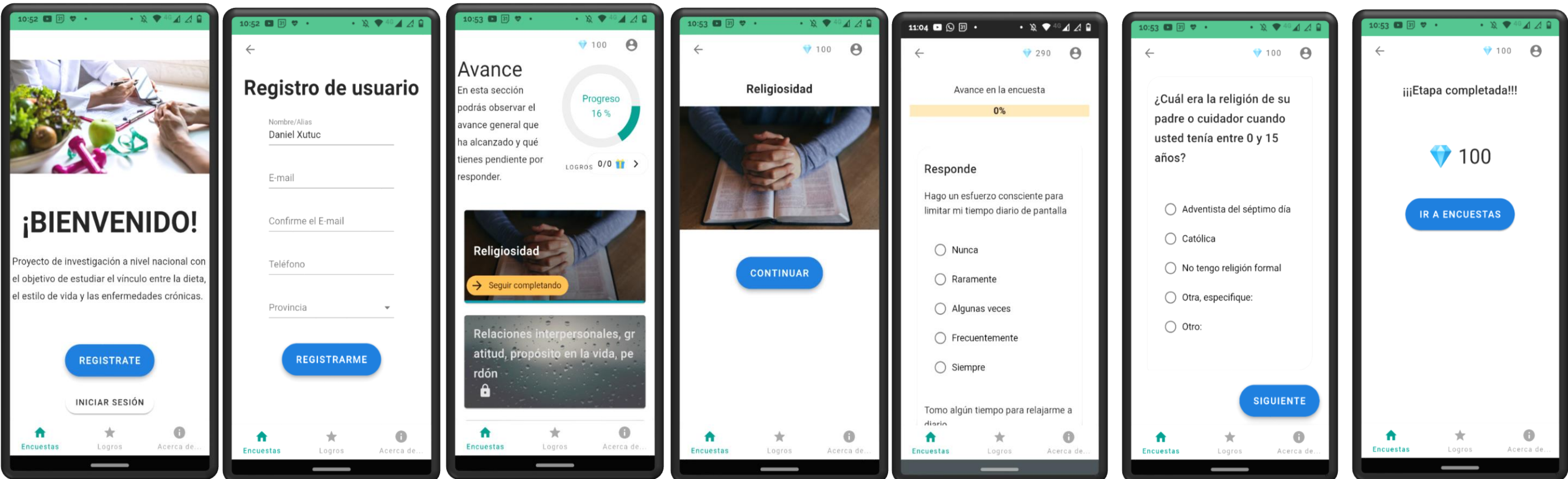
Energy and water	Macronutrients	Vitamins	Minerals
Bioactive compounds β carotene α carotene β cryptoxanthin Lycopene Lutein+zeaxanthin Ethanol Theobromine Caffeine	Total protein Animal protein Vegetable protein Carbohydrate Fiber Total sugar Fat SFA MUFA PUFA ALA 18:3n3 EPA 20:5n3 DPA 22:6n3 DHA 22:6n3 LA 18:n26 Cholesterol	Thiamine Riboflavin Niacin Pantothenic acid Pyridoxine Folic Acid Choline Vitamin B12 Vitamin C Vitamin A Retinol Vitamin E Vitamin D Vitamin K	Calcium Iron Magnesium Phosphorus Potassium Sodium Zinc Copper Manganese Selenium

Screenshot of one question of the FFQ



App for Data Collection

A mobile web application named “SurveyResearch” was designed and developed for data collection and for the generation of a personalized health-related lifestyle habits that is immediately received by the respondent.



Screenshot of some sections of the App.

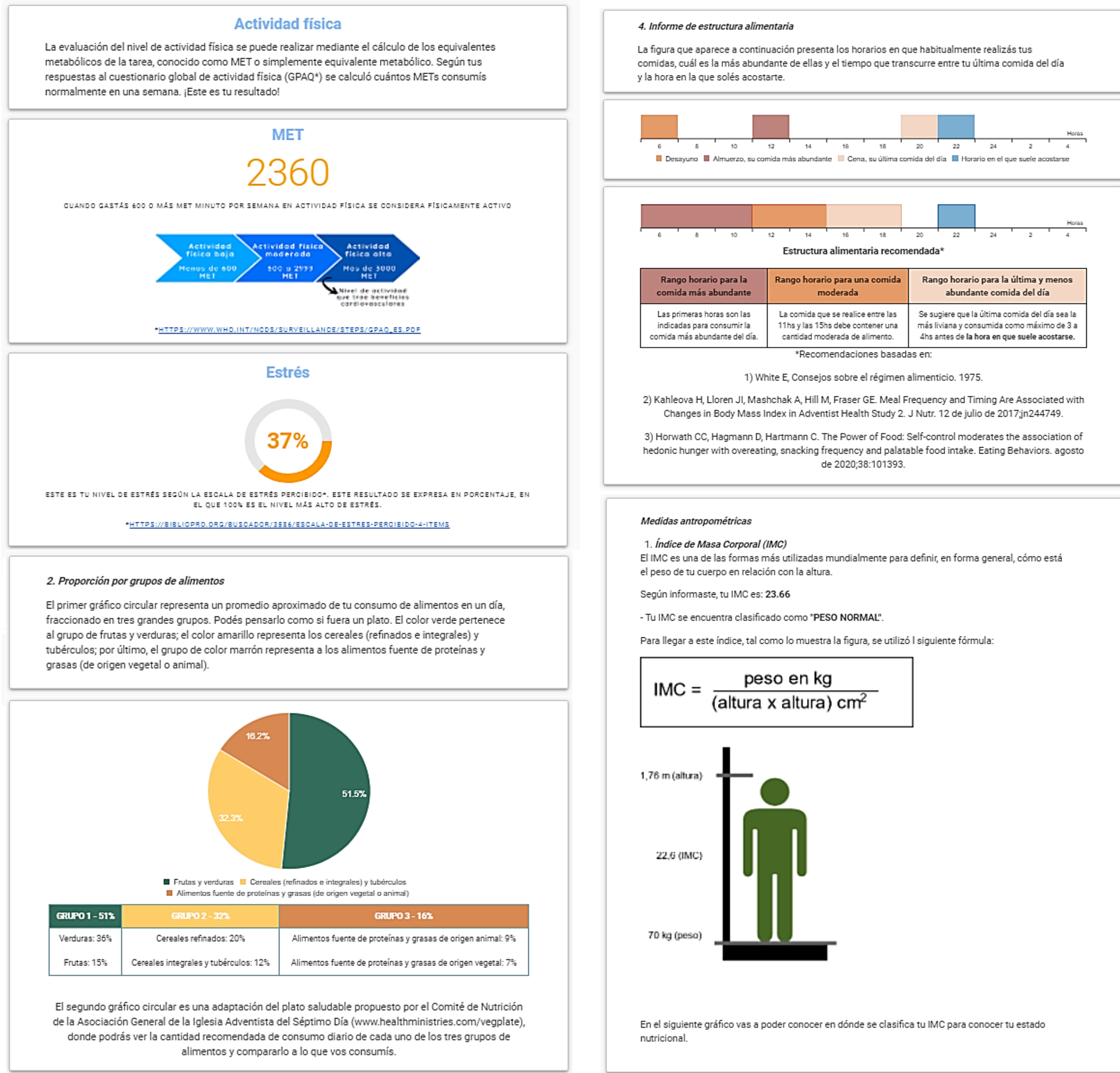
Personalized Report

The health-related lifestyle habits report includes:

- ❖ A table with food groups (fruits, cereals, fats and oils, etc.) and reports on the quantity of the portions that the participant is eating daily.
- ❖ A food chart (image of a food plate) that represents three main food groups (fruit and vegetable, cereal, and protein sources) and contrasted against the recommended food intake chart.
- ❖ A complete nutrient report, which covers energy intake and 50 nutrients.
- ❖ An illustrative image representing meal frequency and timing.

The report also presents data on other aspects of the lifestyle, such as: physical activity, sleep quality and rest, perceived levels of stress, sun and nature exposure, and anthropometric measurements.

The report may be used to objectively self-assess different aspects of lifestyle habits and for decision-making purposes. It also may be shared with a trusted health professional to assist improving lifestyle habits.



Screenshot of some sections of the personalized health-related lifestyle report.

Current Status of AHLESA

The developed instruments such as the MAR24, the FFQ and the Survey Research App are valuable tools for prospective data collection of the AHLESA study during the year 2022 in Argentina.

Bibliography:
Contreras-Guillén IA, Leeson S, Gili RV, Carlino B, Xutuc D, Martins MC, Zapata ME, Segovia-Siapco G, Sabaté J, Pacheco FJ, Pacheco SO. Development and Usability Study of an Open-Access Interviewer-Administered Automated 24-h Dietary Recall Tool in Argentina: MAR24. *Frontiers in Nutrition*. 2021;8.