Challenges

- **Worldwide intake of fruit and vegetables is too low** contributing to poor quality diets and in turn, high prevalence of malnutrition and diet-related non-communicable diseases

- Key barriers to increasing intake include:
  - **Availability** - the gap between supply and demand is large - in part due to post-harvest losses (~40%)
  - **Accessibility** – safe, diverse fruits and vegetables are often not easily accessible to all, especially marginalized populations
  - **Affordability** – costs of safe, diverse fruits and vegetables are high
  - **Desirability** – the choices people make about what to eat are complex and often driven by factors such as convenience, time, image, palatability and culture

- Research in these areas is currently sparse and fragmented

FRESH End-to-End Approach

SUPPLY → FOOD ENVIRONMENT → DEMAND

Nutrition, health & food security

Poverty reduction, livelihoods & jobs

Climate adaptation & mitigation

Enviro health & biodiversity

Gender equality, youth & social inclusion

FRESH Focus Countries

NATIONAL OUTCOME: National level actors prioritize fruits & vegetables (F&V) and institute national-level policies, laws or regulations aimed at increasing F&V intake, production, food safety and/or equity

GLOBAL OUTCOME: At least 10,000 individuals access the Web-based F&V Knowledge Hub as a resource for F&V learning, research and innovations

Focus on Sri Lanka

- Intake of fruit and vegetables (F&V) in Sri Lanka is far below dietary recommendations, contributing to low quality diets, double-burden of malnutrition, and non-communicable diseases.

- Data to characterize F&V intake and overall dietary patterns at the national-level are lacking, and little is known about the effectiveness of interventions to increase F&V intake.

- Sri Lanka has experienced prolonged shocks related to Covid-19 and an economic crisis, which have impacted the food system, including agricultural production as well as consumers' food access in markets.
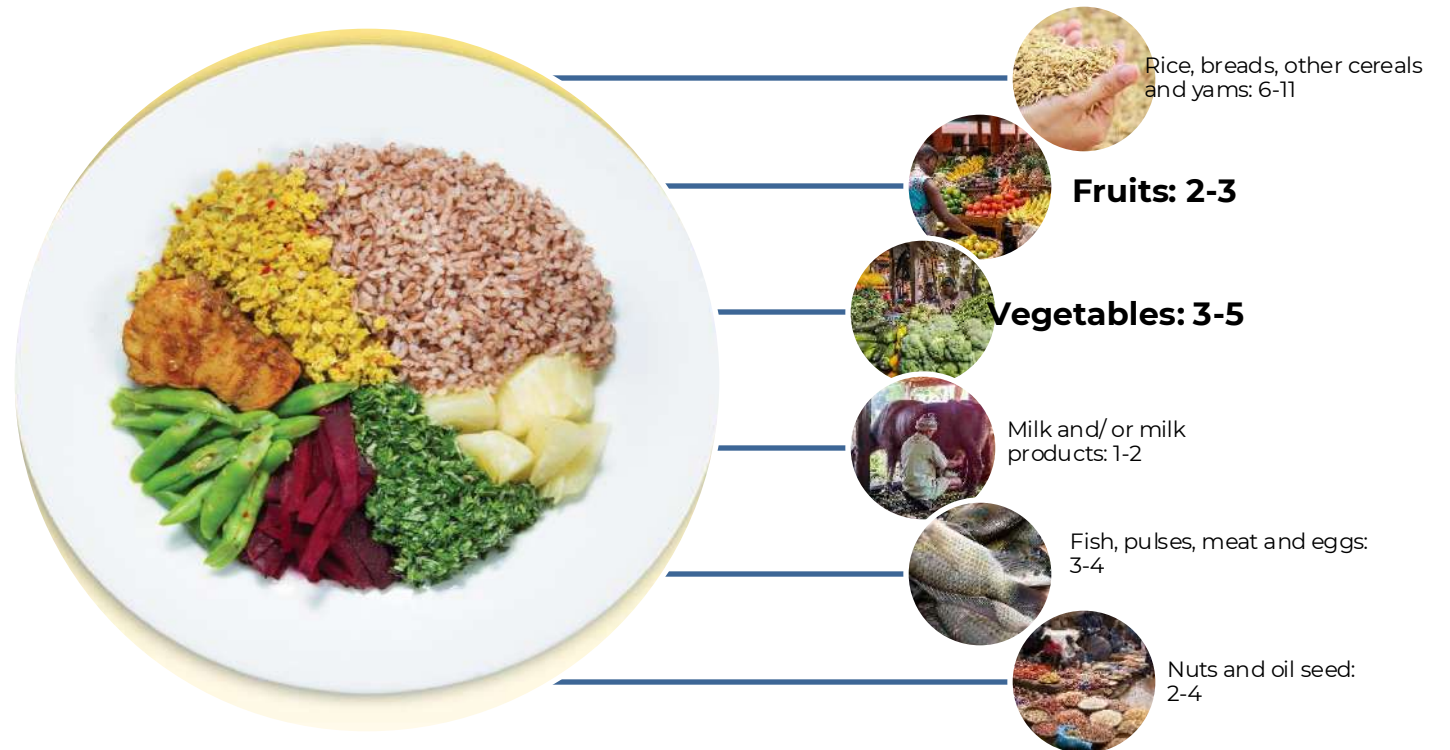
Food Based Dietary Guidelines for Sri Lankans

A Sri Lankan Food Plate

Credit: Department of Applied Nutrition, Wayamba University of Sri Lanka

Rice, breads, other cereals and yams: 6-11

Fruits: 2-3

Vegetables: 3-5

Milk and/ or milk products: 1-2

Fish, pulses, meat and eggs: 3-4

Nuts and oil seed: 2-4

Recommendations for adults in daily servings in the
Food Based Dietary Guidelines for Sri Lankans (updated 2021)

FRESH-FRANI:

Harnessing AI-Driven Nudges to Transform Adolescents' Diets for Sustainable Healthy Futures

Fruit and Vegetables for Sustainable Healthy Diets

CGIAR

Thank you!

Nudging for Good: AI-driven diagnostics and behavior change to improve diets and nutrition

Introduction to FRANI

D4N, Colombo, Sri Lanka, December 2024.

Agenda

- The challenges of unhealthy diets
- Nudging for Good project
- FRANI as a diagnostic tool and an intervention
- Key takeaways and looking forward

• Nutrition and diets during school age and adolescence are critical for development and health

- For adolescent girls they also affect the survival and wellbeing of their children
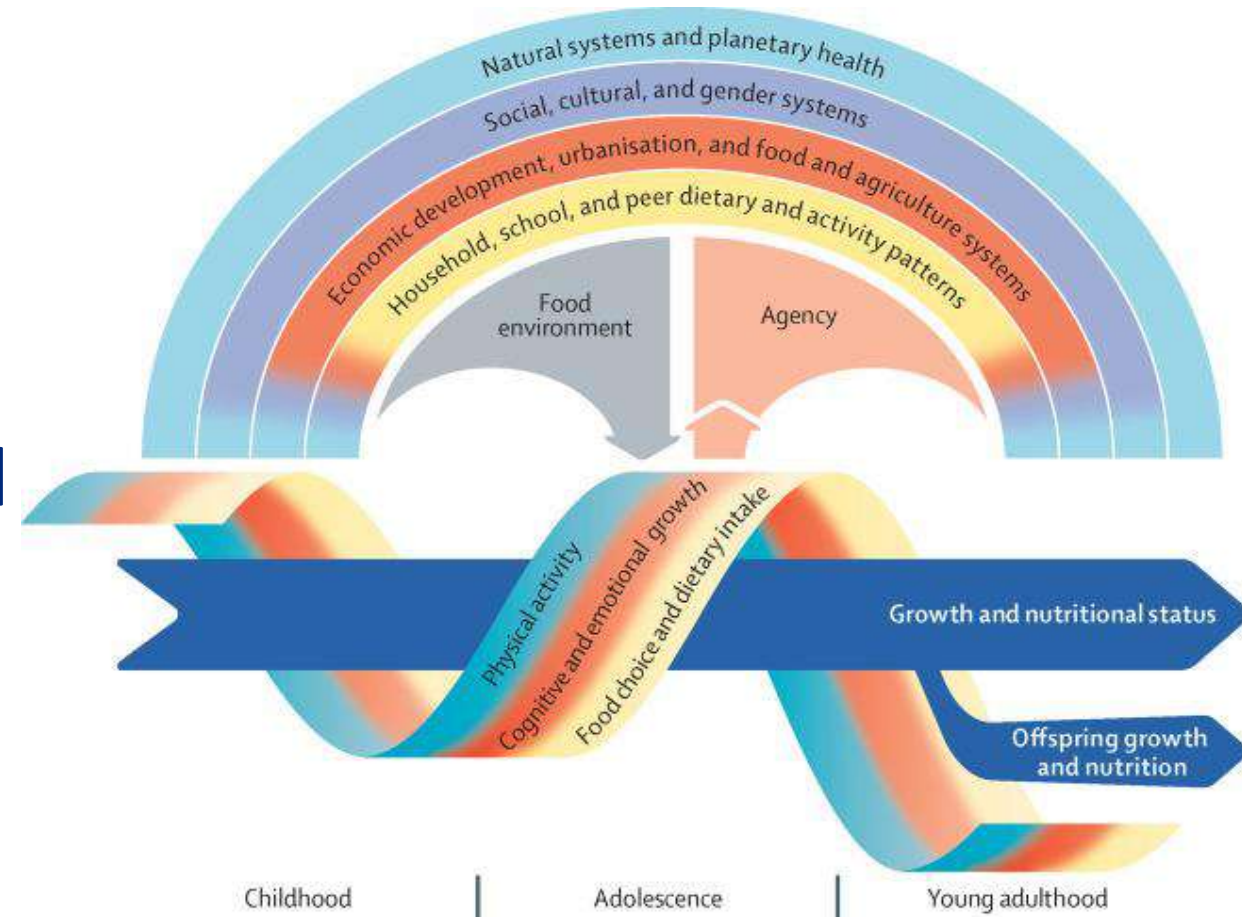
• School age and adolescent nutrition and diets have been largely overlooked in terms of setting global targets

Source: Patton et al., 2021.

Gaps in the data on diets…?

- Collection and use of dietary data is costly and complex (Bell et al., 2017)
  - Dietary surveys commonly use the multi pass 24-hour recall (24HR) method that has been validated for use in LMICs in adults self-reporting their intake and that of their young children and in adolescents (Gibson, RS. and Ferguson, 2008; Arsenault et al., 2020)
  - Undertaking 24HR is expensive: Costs are of the order of $500 per recall (Adams et al., 2022)
  - Age at which children and adolescents can accurately self-report food intake without support is unclear and a range of respondent-related challenges vary with age, (Livingstone & Robson, 2000)
- Technology-assisted dietary assessment tools have been proposed but these are constrained by lack of feasibility and validity assessments in LMICs (Bell et al., 2017)

Nudging for Good

- With $1.2m seed funding by Fondation Botnar and the CGIAR, Nudging for Good is aimed at developing, validating and examining the feasibility of using innovative AI mobile technology that provides offline real-time diagnostics and tailored "nudging" on dietary intake as a strategy to improve diets and nutrition of adolescents living in urban settings in Ghana and Vietnam

Example of real time food recognition

User	
ID	345
Name	
Email	
Country	Ghana

Meal	
ID	23379
Recorded on	2022-08-05T17:38:13Z
Recorded for	2022-08-05
Entry method	Photo

Photo	Photo
Photo mask	Mask
Recognized class	Yam boiled
Recognized class ID	111
Estimated weight	282.876589790215
Portion size	313.3 g (API)
Confirmed At	2022-08-05T17:45:57Z
User confirmed day	today

AI-assisted dietary assessment

The American Journal of CLINICAL NUTRITION

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JOURNAL ARTICLE

Relative validity of a mobile AI-technology–assisted dietary assessment in adolescent females in Vietnam

Phuong Hong Nguyen
Duong Thuy Thi Trươn
Bastien Koch, Peter M
Boateng Bannerman,
Annalyse Kehs, Frank

Volume 116, Issue 4
October 2022

Article Contents

ABSTRACT

Introduction

The American Journal

Pages 992–1001, http:

Published: 09 Augus

Ghana showed
y assess
curate as 24HR
ents

JN THE JOURNAL OF NUTRITION

journal homepage: https://jn.nutrition.org/

Nutrient Requirements and Optimal Nutrition

Validation of Mobile Artificial Intelligence Technology–Assisted Dietary Assessment Tool Against Weighed Records and 24-Hour Recall in Adolescent Females in Ghana

Gloria K. Folson [1,*], Boateng Bannerman [1], Vicentia Atadze [1], Gabriel Ador [1], Bastien Kolt [2], Peter McCloskey [3], Rohit Gangupantulu [3], Alejandra Arrieta [2], Bianca C. Braga [4], Joanne Arsenault [5], Annalyse Kehs [3], Frank Doyle [3], Lan Mai Tran [6], Nga Thu Hoang [7], David Hughes [3], Phuong Hong Nguyen [2,8], Aulo Gelli [2]

[1] Noguchi Memorial Institute for Medical Research, University of Ghana, Accra, Ghana; [2] International Food Policy Research Institute, Washington, DC, United States; [3] Penn State University, State College, PA, United States; [4] Friedman School of Nutrition Policy and Science, Tufts University, Medford, MA, United States; [5] Intake – Center for Dietary Assessment, FHI Solutions, Washington, DC, United States; [6] Emory University, Atlanta, GA, United States; [7] National Institute of Nutrition, Hanoi, Vietnam; [8] Thai Nguyen University of Pharmacy and Medicine, Thai Nguyen, Vietnam
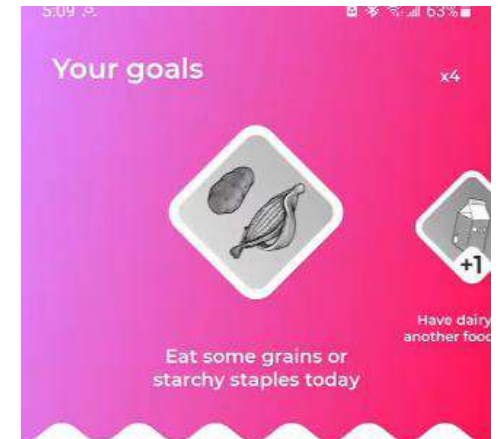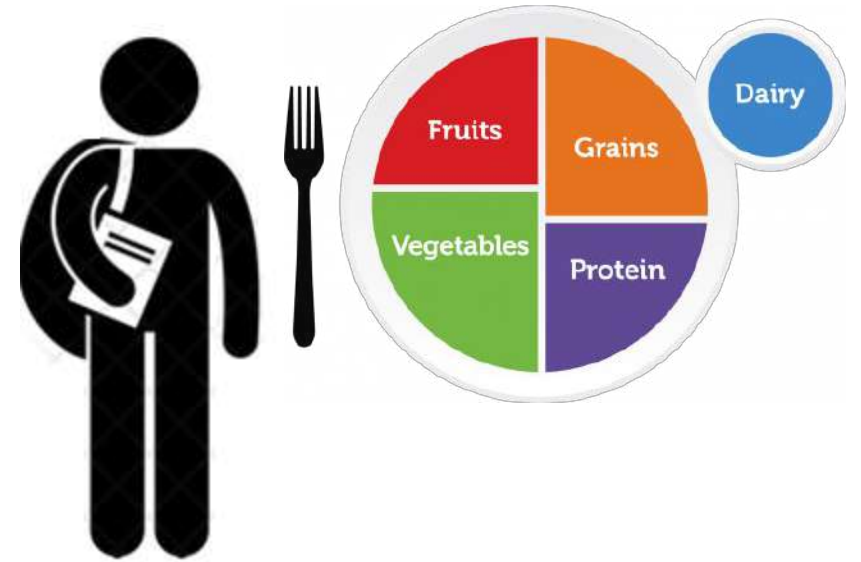
FRANI (Food Recognition Assistance and Nudging Insights)

Validation study: Interpretation


Vs

Cost per daily recall
~$0.50

Cost per daily recall
~$500

Using FRANI to improve diets?

- Using FRANI to "nudge" towards healthy food choices as described by Food Based Dietary Guidelines
  - FRANI includes version with gamified nudging based on USDA Start Simple with MyPlate application
  - We tested feasibility and effectiveness of using FRANI to improve diet quality

Functionality	FRANI	FRANI Control
Account registration and login	✔	✔
Home dashboard	✔	✘
Setting goals	✔	✘
Meal entry (picture taking)	✔	✔
Scores and statistics	✔	✘
Medals and badges	✔	✘
Daily report	✔	✘
Activity feed	✔	✔
Notifications	✔	✔

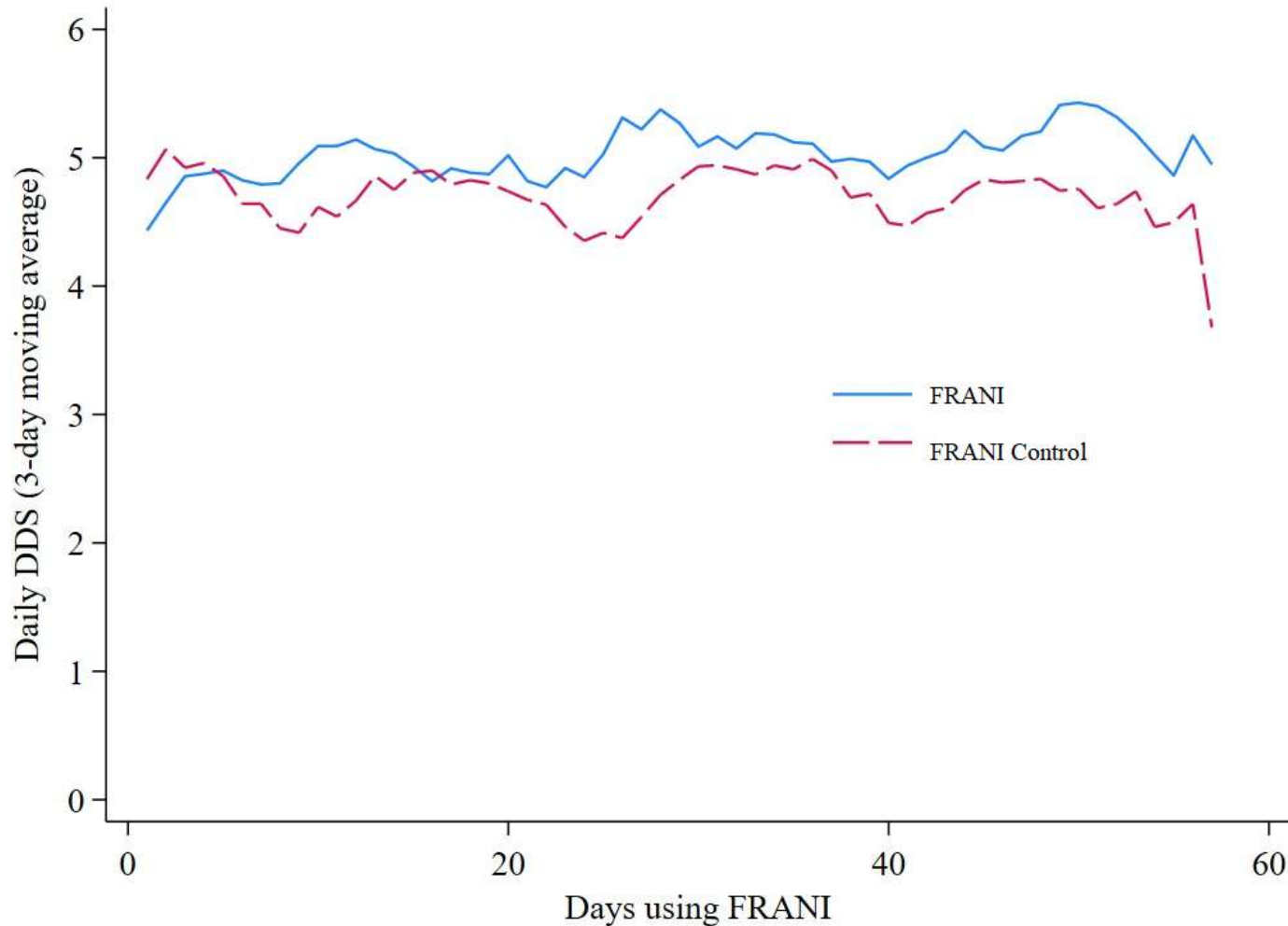# FRANI nudges towards better diets…
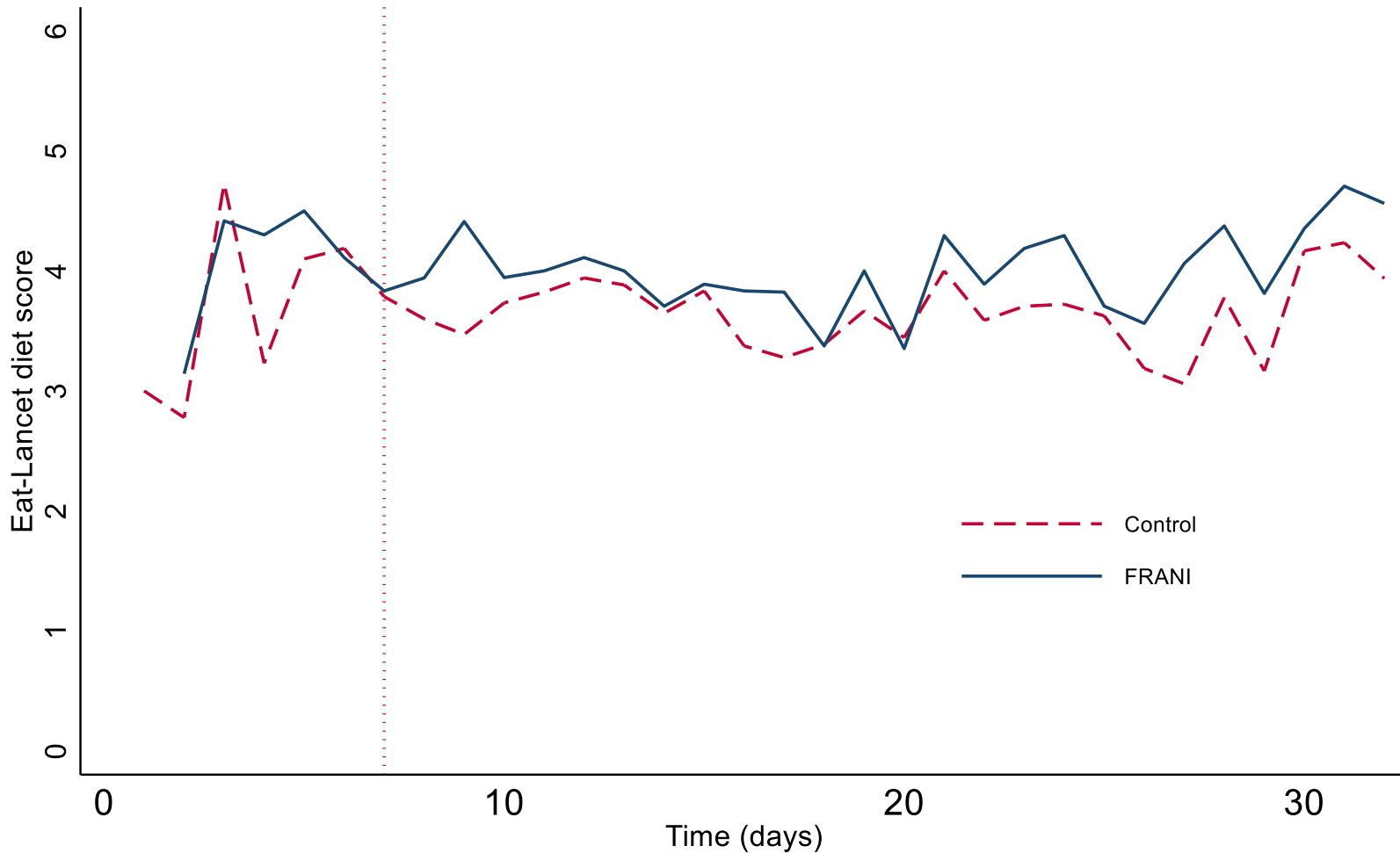
In Vietnam, randomized pilot tracked diet over 30 days with adolescent females 12-19y using FRANI and FRANI Control

- Increase in mean daily EAT Lancet diet score ~1.1 points over a base level of 3.7 (p=0.032)

Source: Braga et al., 2023.

FRANI nudges towards more diverse diets

In Ghana, randomized pilot tracked diet over 55 days with female youth 18-24y using FRANI and FRANI Control
- Increase in mean daily diet diversity score ~0.4 points over a base level of 5.3 (p=0.020), effect size~0.3 SDs

Key takeaways

- FRANI involves a groundbreaking approach for measuring dietary intake, which could save a lot of time, money and improve precision of measurements

- Rigorous analyses show that FRANI performs well when compared to gold standard measure in dietary assessment in children and youth (10-24y), at a fraction of the cost

- Evidence from randomized pilots also suggests that FRANI can be used to nudge users towards healthy diets

- So… really good news!

- Further improvement margins in precision are also possible
  - Improving AI model, portion estimation algorithms & underlying food databases

- Now working on taking FRANI to scale!

The Nudging for Good Project team includes contributions from: Noora Aberman, Gabriel Ador, Alejandra Arrieta, Vicentia Adatze, Boateng Bannerman, Bianca C. Braga, Frank Doyle, Gloria Folson, Rohit Gangupantulu, Aulo Gelli, Nga Thu Hoang, David Hughes, Phuong Nam Huynh, Naureen Karachiwalla, Annalyse Kehs, Bastien Koch, Pete McCloskey, Phuong H Nguyen, Giordano Palloni, Marie Ruel, Lan Mai Tran, Trang Huyen Tran, Duong Thuy Trương, Sawudatu Zakariah-Akoto.

Thank you!

Taking FRANI to scale!

Sri Lanka, Malawi, Benin, Burundi, Kenya

Ghana and Vietnam

Phase 1:
Building food and image databases

Phase 2:
Develop AI model

Phase 3:
Pilot test

Phase 4:
Deploy and scale-up

Phase 1	Phase 2	Phase 3	Phase 4
• Develop food inventory of most commonly consumed foods • 1st wave of real-world images of most commonly consumed foods (~200 images) • Start to build food class list, recipe and food composition databases	• Cook recipes and take graduated real-world images • Develop portion size database • Annotate images (~5,500-6,500) • Train segmentation model(s) • Finalise databases, including packaged foods	Depends on needs, e.g. • FRANI Validation study • Feasibility study of FRANI-based nudging • Pilot monitoring of school meal quality • Customise admin panel • Prepare scale-up plan (activities, scale, licensing...etc..)	• Release on Playstore • Promote and monitor uptake • Troubleshoot and maintenance • AI model improvements • Effectiveness trial of using FRANI based nudging to improve diets

Legend:
Funded
Seeking funds

Nudging for Good as social enterprise

- Aim to operate through a sustainable business model
  - Public and private sector partnership, with goal of developing and maintaining technology as a public good, whilst operating sustainably to improve diets at scale

- Business plan, includes potential revenue streams and costs for operating at scale
  - Develop licensing model for 3 types of clients, including 1) individuals improving their diets; 2) research and Government entities looking to collect high-quality dietary data, and Governments and development partners (e.g. WFP) operating school meal programs at scale that are struggling with collecting and analysing monitoring data on meal quality

- Develop capacity for Ghana to act as regional hub for scale-up

PROMOTING FOOD BASED DIETARY GUIDELINES THROUGH FRANI

DR. SACHINTHA DILHANI,

CONSULTANT COMMUNITY PHYSICIAN

NUTRITION DIVISION

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2021

FBDGs

① Eat whole grains and less polished or refined grains

② Add Color to your daily meals balancing the correct amounts

Eat at least 2 vegetables, one green leafy vegetable and 2 fruits daily.

③ Add fish or egg or lean meat together with pulses at every meal.

FOOD
BASED
DIETARY
GUIDELINES
FOR SRI LANKANS

F
B
D
G

Practitioner's
Handbook

Ministry of Health
Nutrition Division
2021

"WHY FOOD-BASED DIETARY GUIDELINES MATTER: PROMOTING HEALTH AND NUTRITION"

- **Poor Food Consumption Patterns Among Adults**

  Low Intake of Fruits and Vegetables

  High Consumption of Salt, Sugar, and Unhealthy Fats

- **High Prevalence of Overweight and Obesity Among Adults**

  Linked to poor dietary habits and sedentary lifestyles.

- **Increasing Trend of Non-Communicable Diseases (NCDs)**

  Rising cases of diabetes, heart disease, and hypertension.

Rising prevalence of overweight and obesity among adults

Overweight

Obesity

BMI > 25Kg/m^2
Female - 47.6%
Male   - 30.0%

BMI > 30kg/m^2
Female   - 15.2%
Male   - 6.3%

STEPS Survey 2021 ; Results for adults aged 18 – 69 years (95% CI)

Poor Food Consumption Patterns Among Adults
🍎 Low Intake of Fruits & Vegetables 🌽

Step 1 Diet	
Mean number of days fruit consumed in a typical week	3.4 (3.4-3.5)
Mean number of servings of fruit consumed on average per day	1.2 (1.2-1.3)
Mean number of days vegetables consumed in a typical week	6.5 (6.5-6.6)
Mean number of servings of vegetables consumed on average per day	3.3 (3.2-3.5)
Percentage who ate less than 5 servings of fruit and/or vegetables on average per day	67.8% (66.1-69.6)

Poor Food Consumption Patterns Among Adults
High Salt Consumption

Percentage who always or often add salt or salty sauce to their food before eating or as they are eating	3.5% (2.8-4.2)
Percentage who always or often eat processed foods high in salt	8.2% (7.2-9.2)
Percentage who put salt into rice during cooking	55.3% (53.7-56.9)
Mean intake of salt per day (in grams) (Levels of sodium and creatinine in spot urine samples are used in STEPS to estimate population 24 hour salt intake, using the **Kawasaki equation**)	14.2 (14.0-14.4)

HISTORY OF FOOD-BASED DIETARY GUIDELINES (FBDGS)

- **Timeline of FBDG Revisions**

- **2002**: First FBDGs published.

- **2011**: First major revision.

- **2021**: Latest update, reflecting new evidence-based information.

- Carried out by the **Nutrition Division**, integrating **environmentally sustainable healthy diets**.

- Revision process began in **2019**, with **input from stakeholders** in the Ministry of Health and academia.

KEY FEATURES OF THE 2021 FBDG EDITION

- Presented in a **user-friendly, attractive format** to raise awareness of healthy eating.

- **Thorough revisions** across all chapters, with the addition of new content, including:

  - **Sleep**

  - **Functional foods**

  - **Vegetarian diets**

- **14 FBDGs** and **4 special messages** targeting specific groups.

Food Based Dietary Guidelines for Sri Lankans
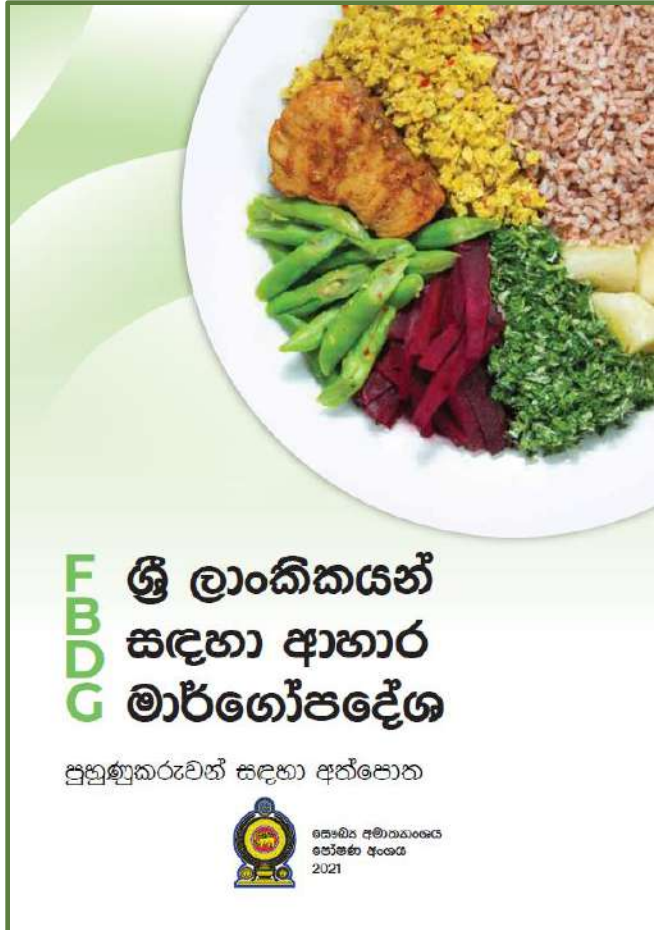
➢ Practitioners Handbook – written for health staff

➢ But can be easily understood by everyone!

➢ **nutrition.health.gov.lk visit today and refer…**

Dietary Guidelines

Add Color to your daily meals balancing the correct amounts.

Add rainbow colours to give variety to your daily meals

Eat whole grains and their products including less polished or parboiled rice, instead of refined grains and products.

2

Eat parboiled or less polished rice instead of refined.
Consume whole grains and their products

Eat at least 2 vegetables, one green leafy vegetable and 2 fruits daily.

Eat at least five varieties of vegetables and fruits everyday.
Eat 6 table spoons from two different vegetables, 3 table spoons from green leafy vegetables, and two fruits daily.

Eat fish or egg or lean meat with pulses at every meal.

Eat three table spoons of pulses such as dhal, chickpeas, greengrams, soya in each meal.
A healthy adult can consume one egg daily.

Have fresh milk or its fermented products.

5

Drink fresh milk.
Eat fermented fresh milk products such as curd and yoghurt.

Eat a handful of nuts or oily seeds daily.

Nuts such as peanuts, cashew, as well as oily seeds such as gingelly, pumpkin seeds give you healthy fat.

Limit salty foods and adding salt to food.

Take less than one tea spoon (5 g) of iodized salt per person per day.
Limit salty foods.

Limit sugary drinks, biscuits, cakes, sweets and sweeteners.

Limit adding sugar to food and beverages.
Limit consumption of sugar to 6 tea spoons daily.

INFORMATION ON SERVING SIZES

The serving sizes and the number of servings required from foods belonging to each of the six food groups are given in detail in the FBDGs

HOW 'FRANI' CAN HELP

FRANI

- Tracks diets

- Recognize food

- Give dietary information (based on FBDGs)

- Provide gamified nudges to prompt healthy dietary choices

A TOOL TO POPULARIZE AND DISSEMINATE **FBDGS**

1. **Personalized Feedback:**
   1. Offers tailored dietary suggestions based on FBDGs.
   2. Helps users understand their nutritional needs.

2. **Youth Engagement:**
   1. Appeals to tech-savvy young users, fostering early adoption of healthier habits.
   2. Encourages sustainable behavior change through innovative, tech-driven solutions.

3. **Behavioral Impact:**
   1. Indirectly motivates users to align their diet with FBDGs.
   2. Promotes consistent, positive dietary choices.

4. **Wide Reach:**
   1. Utilizes mobile technology to reach a broad group of population.
   2. Facilitates dissemination of FBDGs at scale, particularly among underserved populations.

UNLOCK THE POWER OF HEALTHY EATING; FOLLOW FBDGS

By making FBDGs **accessible, relatable, and actionable**, this app can play a pivotal role in improving dietary habits at both individual and population levels….

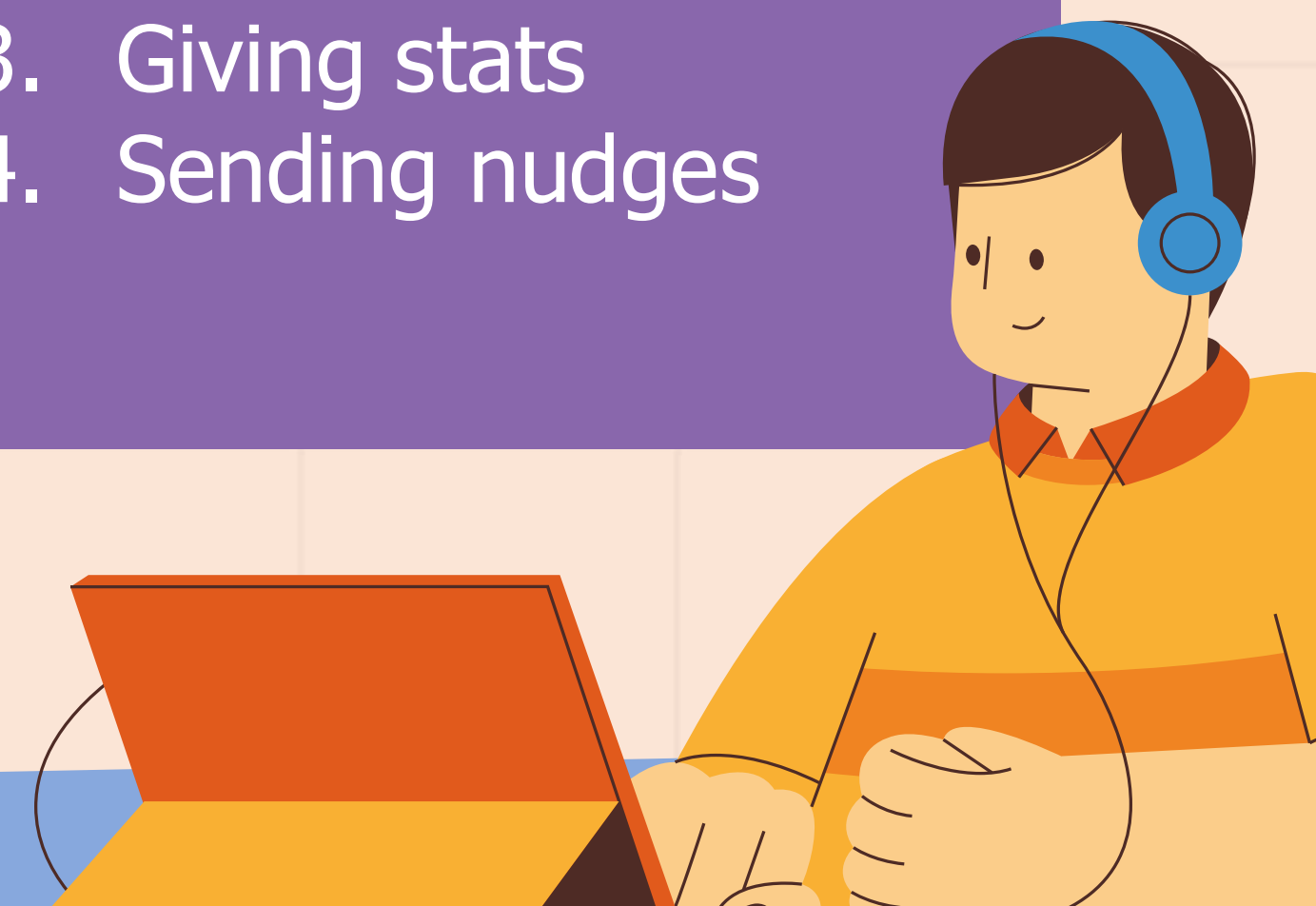"Let's continue working together to empower individuals to make healthier food choices for a better future"
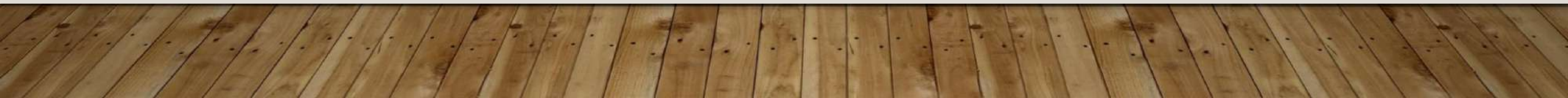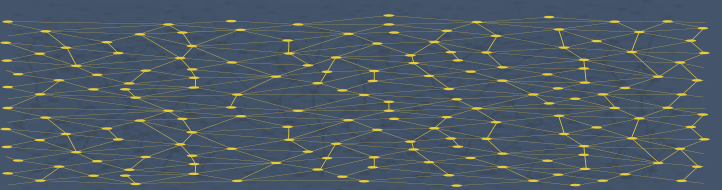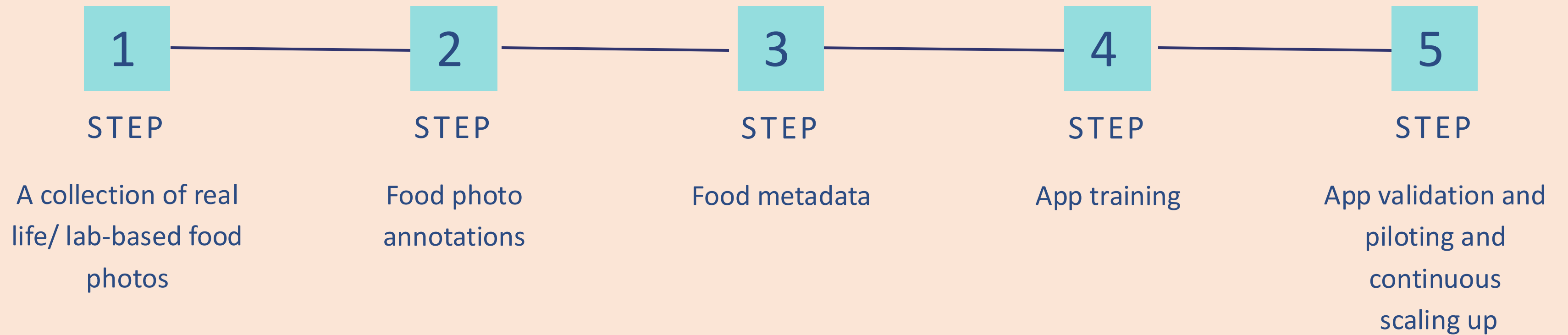
Thank You
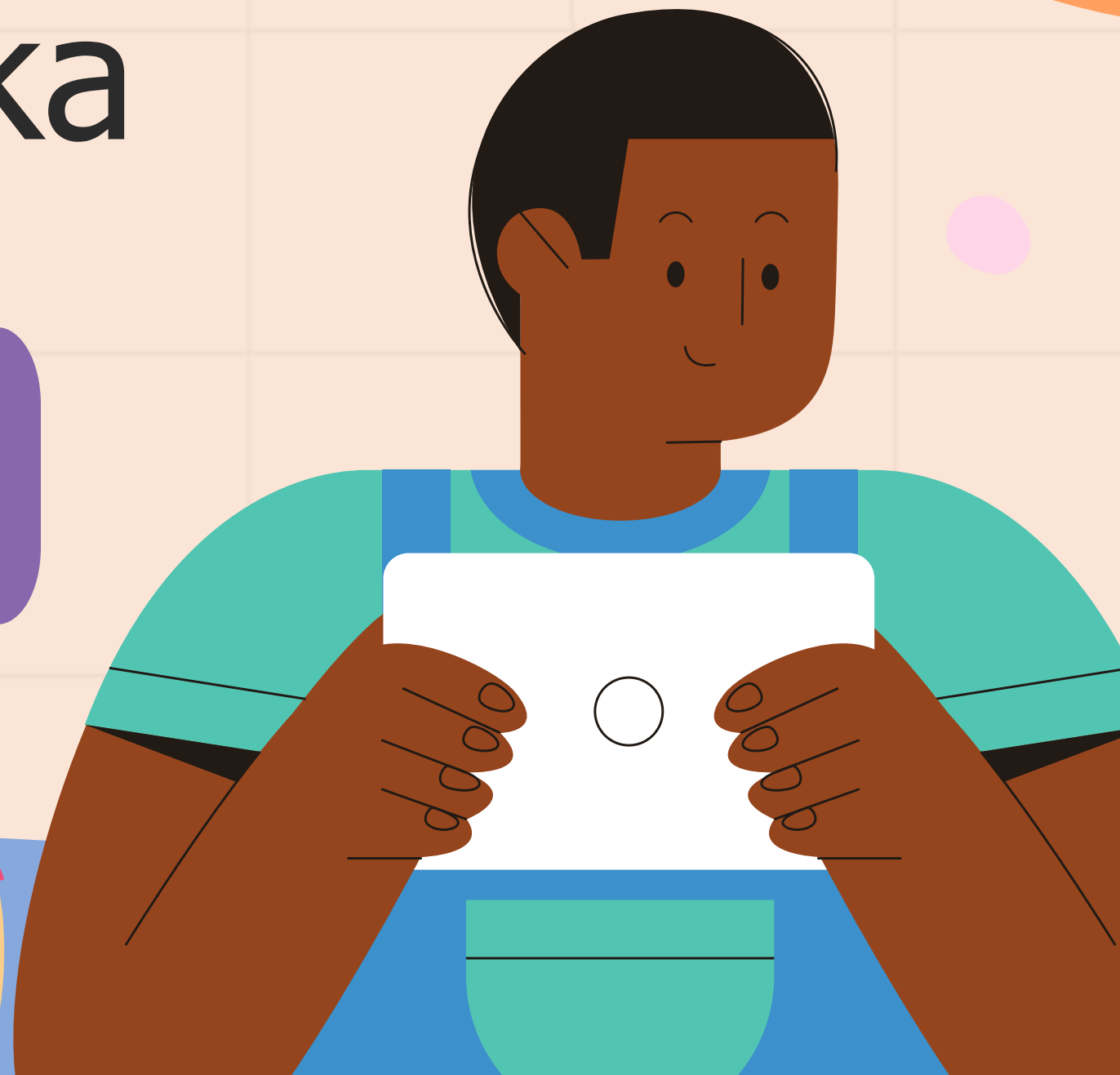
AI-Assisted smartphone application to track and record diets of female adolescents in Sri Lanka

→
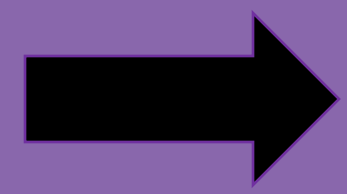
1. Capturing/ recording
2. Tracking
3. Giving stats
4. Sending nudges

How FRANI SL was Set up

1

STEP

A collection of real life/ lab-based food photos

2

STEP

Food photo annotations

3

STEP

Food metadata

4

STEP

App training

5

STEP

App validation and piloting and continuous scaling up

Let's Take a Closer Look✨

A collection of real life/ lab-based food photos

Developed a food inventory of most consumed food by adolescent girls in Sri Lanka (n = 238)

Manual entry food list (n = 164): App cannot identify through a photo, but details are available in the app. This food list mainly includes the packaged food items. Users can manually enter these food items to the app.

Took a series of real-world food images to get an idea on SL food

Cooked and collected more photos (a total of >8000 photos)

Food photo annotations

Photo taking

- Photos were taken with two different angles (45 degrees & 90 degrees).

- To facilitate the estimation of portion sizes, a "pop-socket" was used as a standardized visual prop.

- All the photos were taken with different portion sizes (4 standard portion sizes: small, medium, large, extra large), different plating methods, different backgrounds and different combinations to maximize the variation of each photo.
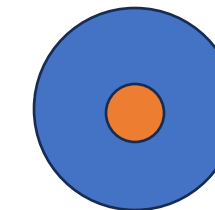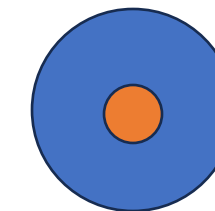
All photos were taken by a smartphone

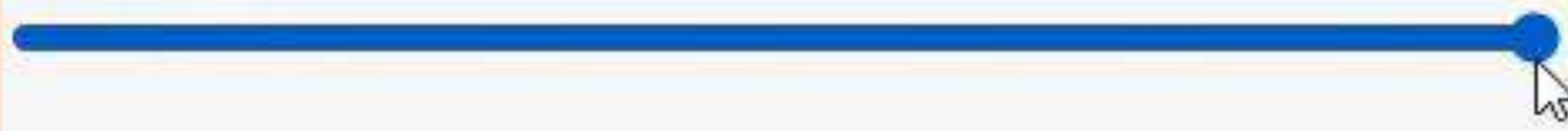For each food, use variation in weight-per-pixel due to "heaping" to model depth

Side view   Top view

A

B

Food Photo Annotation

Original image

Annotated image

Mask opacity

Food Metadata Compilation

1_classes

class_id	Food name	dds_1_grains	dds_2_pulses	dds_3_nuts	dds_4_dairy	dds_5_meat_fish	dds_6_eggs	dds_7_dglveg	dds_8_fruit_veg_vita	dds_9_veg_oth	dds_10_fruit_oth	shds_1_grains	shds_2_tubers	shds_3_veg	shds_4_fruits	shds_5_dairy	shds_6_beef_lp	shds_7_poultry	shds_8_eggs	shds_f
3	Biriyani, chicken	1	0	1	1	1	1	0	0	0	0	1	0	0	0	1	0	1	1	
4	Bread, white	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	
5	Bread, with fat spread	1	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	
6	Bread, with jam	1	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	
7	Bread, with marmite	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	
8	Bun, currant	1	0	0	1	0	1	0	0	1	1	1	0	0	1	1	0	0	1	
9	Bun, fish	1	0	0	1	1	1	0	1	0	1	1	1	1	0	1	0	0	1	
10	Bun, jam	1	0	0	1	0	1	0	0	1	0	1	0	0	1	1	0	0	1	
11	Bun, seeni	1	0	0	1	0	1	0	0	1	0	1	0	0	0	1	0	0	1	
12	Bun, seeni sambol	1	0	0	1	0	1	0	1	0	1	1	0	0	0	1	0	0	1	
13	Burger, chicken, with bun	1	0	0	1	1	1	1	0	1	1	1	0	0	1	1	0	1	1	
14	Chinese rolls	1	0	0	1	0	0	0	0	1	1	1	1	1	0	1	0	0	0	
15	Corn, boiled	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
16	Cup cake	1	0	0	1	0	1	0	0	0	0	1	0	0	0	1	0	0	1	
17	Cup cake, iced	1	0	0	1	0	1	0	0	0	0	1	0	0	0	1	0	0	1	
18	Cutlet, fish	1	0	0	1	1	0	1	0	1	0	1	1	1	0	1	0	0	0	
19	Donut	1	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	
20	Fried rice, chicken	1	0	0	0	1	1	0	1	1	0	1	0	1	0	0	0	1	1	
21	Hoppers	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	
22	Hoppers, egg	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	
23	Hoppers, honey	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	
24	Kottu, chicken	1	0	0	0	1	1	0	1	0	1	1	0	1	0	0	0	1	1	
25	Macaroni, mixed with vegetables	1	0	0	0	0	0	1	1	0	1	1	0	1	0	0	0	0	0	
26	Milk rice	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	
27	Noodles, added with vegetables	1	0	0	0	0	0	1	1	0	1	1	0	1	0	0	0	0	0	

Sheets: Cover sheet | 1_classes | 2_class_ingredients | 3_food_composition_table

2_class_ingredients

class_id	class_name	ingredient_name	ingredient_id	class_ingredient_fraction
3	Biriyani, chicken	Curd, buffalo, whole, raw	23754	0.0584
3	Biriyani, chicken	curry powder (3/5 mix) TK	25001	0.0066
3	Biriyani, chicken	Turmeric powder, raw	24524	0.0018
3	Biriyani, chicken	Chili powder, raw	2913	0.0084
3	Biriyani, chicken	Sauce, soy, light, thin	2772	0.0026
3	Biriyani, chicken	Saffron	2953	0.0073
3	Biriyani, chicken	Sauce, oyster	2768	0.0036
3	Biriyani, chicken	Salt	3106	0.0055
3	Biriyani, chicken	Garam masala	2930	0.0036
3	Biriyani, chicken	Green peas, dried, raw	24110	0.0146
3	Biriyani, chicken	Onion, big, raw	24535	0.0073
3	Biriyani, chicken	Garlic, small, clove, raw	24538	0.0058
3	Biriyani, chicken	Green chilies, raw	24611	0.0004
3	Biriyani, chicken	Butter, salted	23865	0.0109
3	Biriyani, chicken	Ghee, butter	2506	0.0146
3	Biriyani, chicken	Potato, pink skin,	24720	0.0441
3	Biriyani, chicken	Cashew	24521	0.0365
3	Biriyani, chicken	Rasin, dried, black, raw	24786	0.0365
3	Biriyani, chicken	Curry leaves, raw	24598	0.0004
3	Biriyani, chicken	Tomato, hybrid, raw	24837	0.0365
3	Biriyani, chicken	Chicken, poultry, thigh, skinless, raw	24486	0.2484
3	Biriyani, chicken	Rice, white, basmati, boiled	24388	0.1824
5	Bread, with fat spread	Bread, white	23867	0.8710
5	Bread, with fat spread	Astra, margarine	23811	0.1290
6	Bread, with jam	Bread, white	23867	0.7500

Sheets: Cover sheet | 1_classes | 2_class_ingredients | 3_food_composition_table

➤ The developed food database for the priority food list consists of three excel sheets.

1. Food class classification based on ingredients: All food items have classified based on their ingredients which facilitates calculation of Dietary Diversity Scores (DDSs).
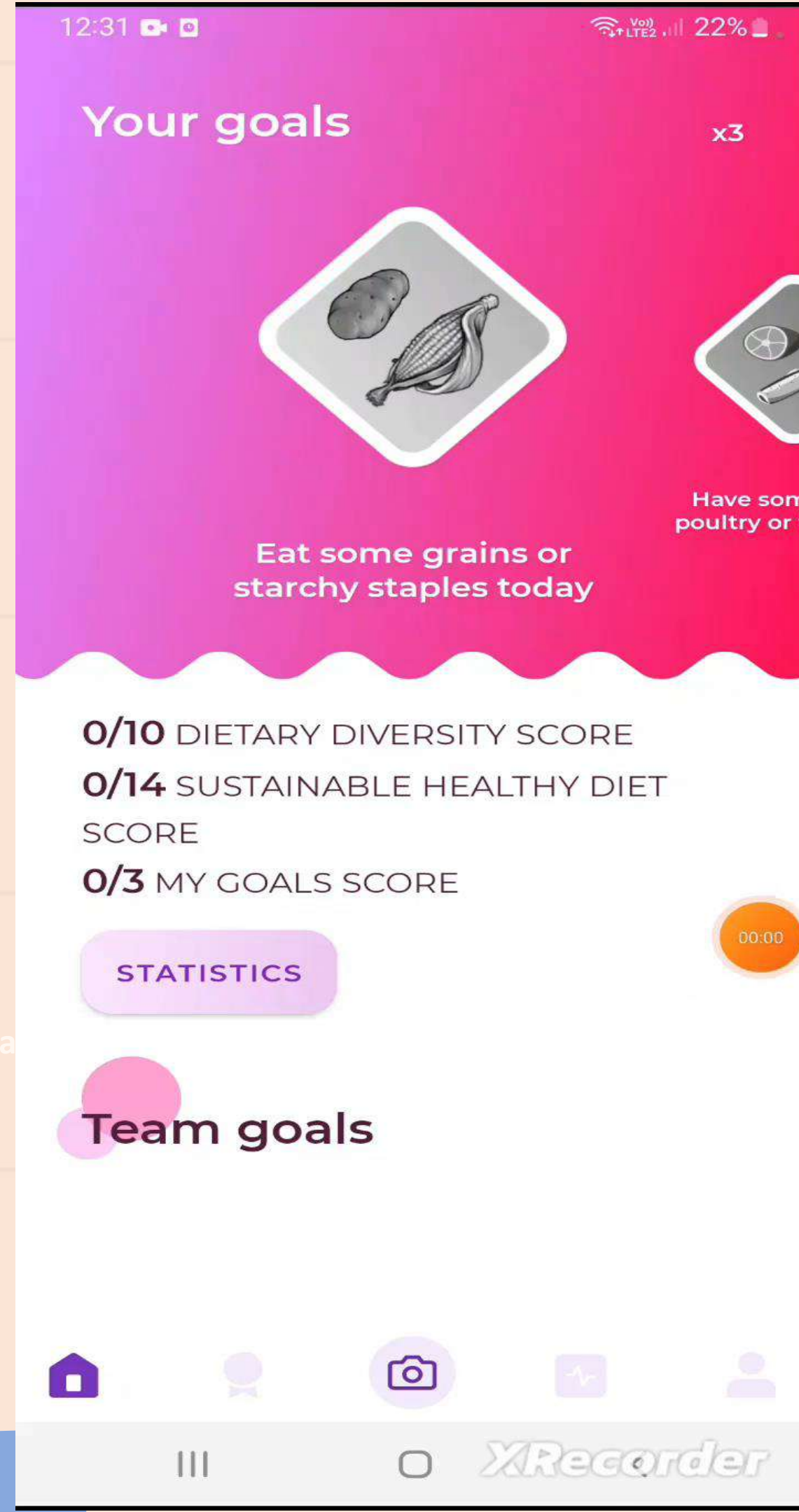
2. Recipe information including ingredient fractions: All priority food were cooked in a control lab setting and recipes of each food were collected.

3. Food composition data of raw ingredients: This sheet contains the food composition data of each raw ingredients of the recipes.

Final Product

Let's see how FRANI SL works

Aims and Objectives

To validate FRANI (Food Recognition Assistance & Nudging Insight), against the gold standard of weighed food records (WFR) and comparing the performance of FRANI to a standard 24hr-recall (24HR) method.

1

Estimate mean nutrient intakes reported in the FRANI app, 24HR, and WFRs.

2

Estimate the validity of the FRANI app vs WFR to measure macro- and micronutrient (calcium, folate, iron, niacin, riboflavin, thiamine, zinc, vitamin A, vitamin B6, vitamin B12, and vitamin C).

3

Compare the relative agreement of the FRANI app vs 24HR.

4

Assess the error in the FRANI app and 24HR

Estimating the #omissions and intrusions &

Mean portions consumed for the most common food items relative to WFRs.

Methodology

Subject recruitment

Sample size	60
Subjects	Adolescent girls aged between 14-18 years
Study Area	Kuliyapitiya (North-Western Province): peri-urban
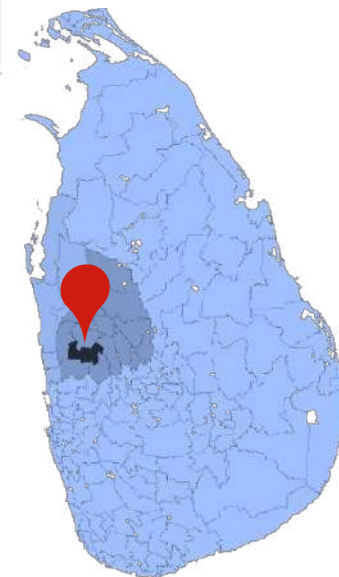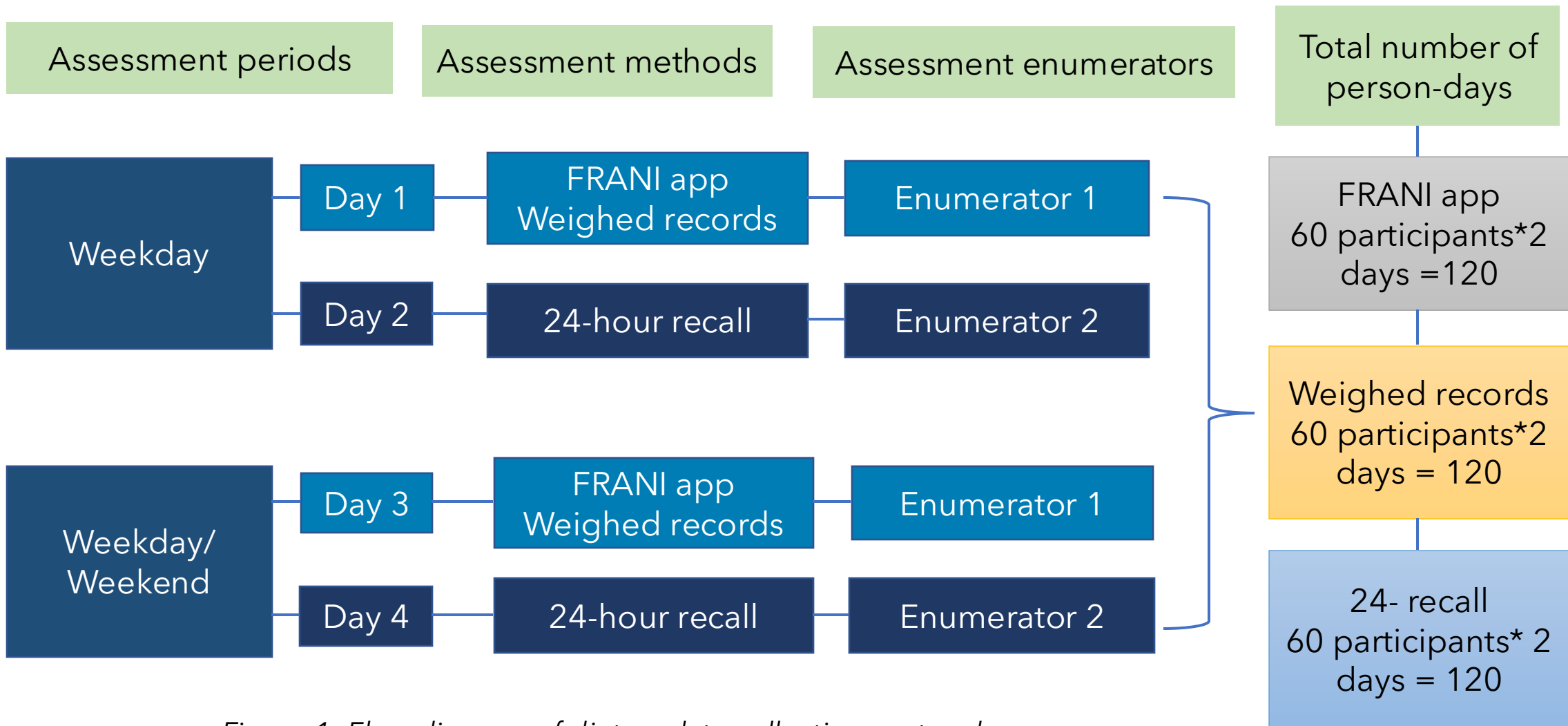
Figure 1: Flow diagram of dietary data collection protocol

Data Analysis

In progress..

1 The mean probability of adequacy (MPA) of micronutrient intake

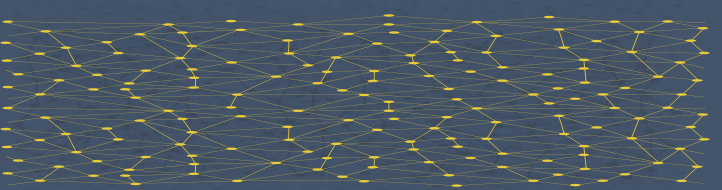**2** Intakes of different food groups and dietary diversity of individuals

3 The equivalence bounds and extent of agreement of FRANI with WR and 24HR methods

4 The sources of error (memory, omission, intrusion, and portion estimation) for FRANI and 24HR methods

Feedback from the study participants

Next Steps
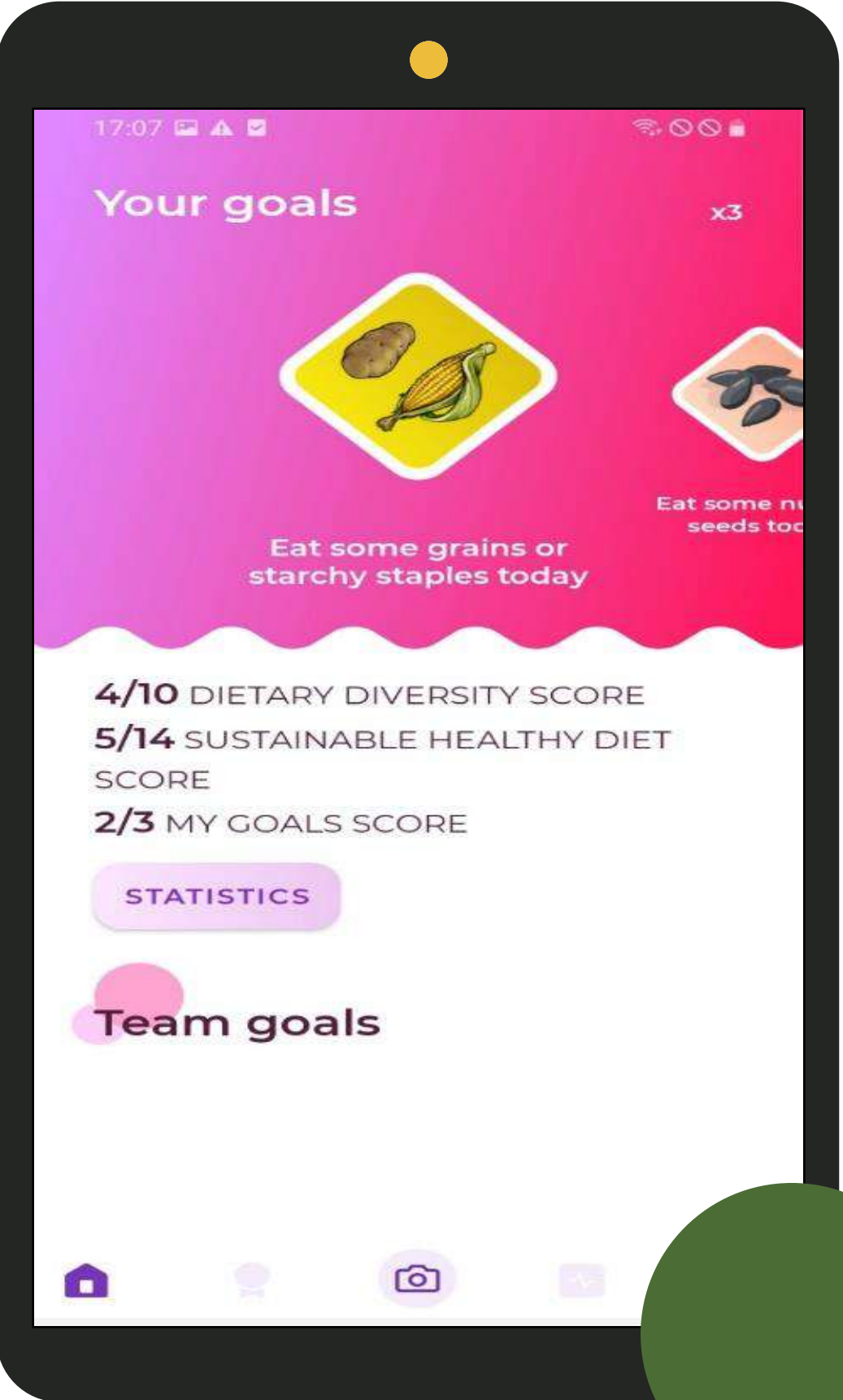
Validation

Validating FRANI, against the gold standard of weighed food records (WFR) and comparing FRANI performance to a standard multi-pass 24HR method

Pilot & Feasibility

Assessing the feasibility of using FRANI to improve food choices of adolescent girls in Sri Lanka
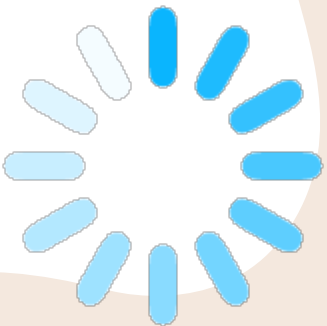
FRANI Pilot & Feasibility Study
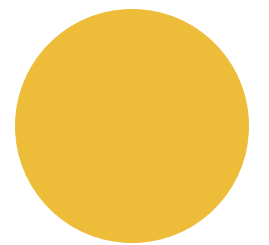
60 adolescent girls	Use of FRANI app 4 weeks
30 adolescent girls	FRANI without Nudges 2 weeks
30 adolescent girls	FRANI with Nudges 2 weeks

Nudging Messages
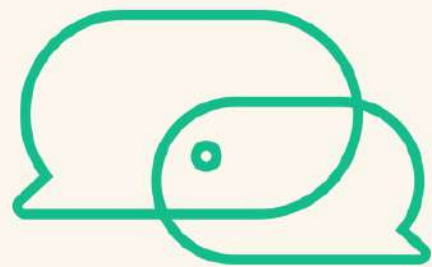
Grains and starchy staples

- Eat some grains or starchy staples today
- Have grains or starchy staples with another food group

Legumes, nuts and seeds

- Eat some pulses (beans, peas and lentils) today
- Eat some nuts or seeds today
- Have pulses, nuts, or seeds with another food group

Fruits and vegetables

- Eat some dark green vegetable today
- Have a meal with 3 different fruits and vegetables
- Have an orange (vitamin-A rich) fruit or vegetable today

Dairy

- Eat some dairy today
- Have dairy with another food group

Animal source foods

- Have some meat, poultry or fish today
- Have some eggs today
- Have meat, poultry, fish, or eggs with another food group

What are food groups?

LEARN MORE

SET GOALS

Where We Heading?

01 Upgraded FRANI
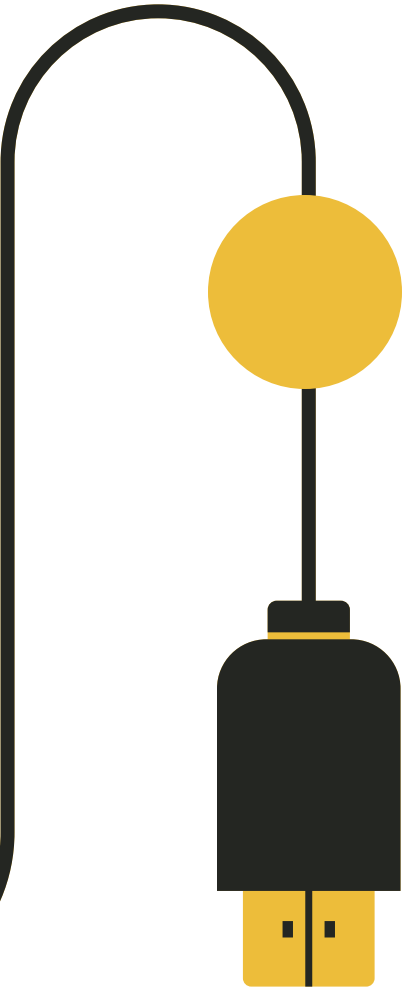
02 FRANI for school meals/ young adults

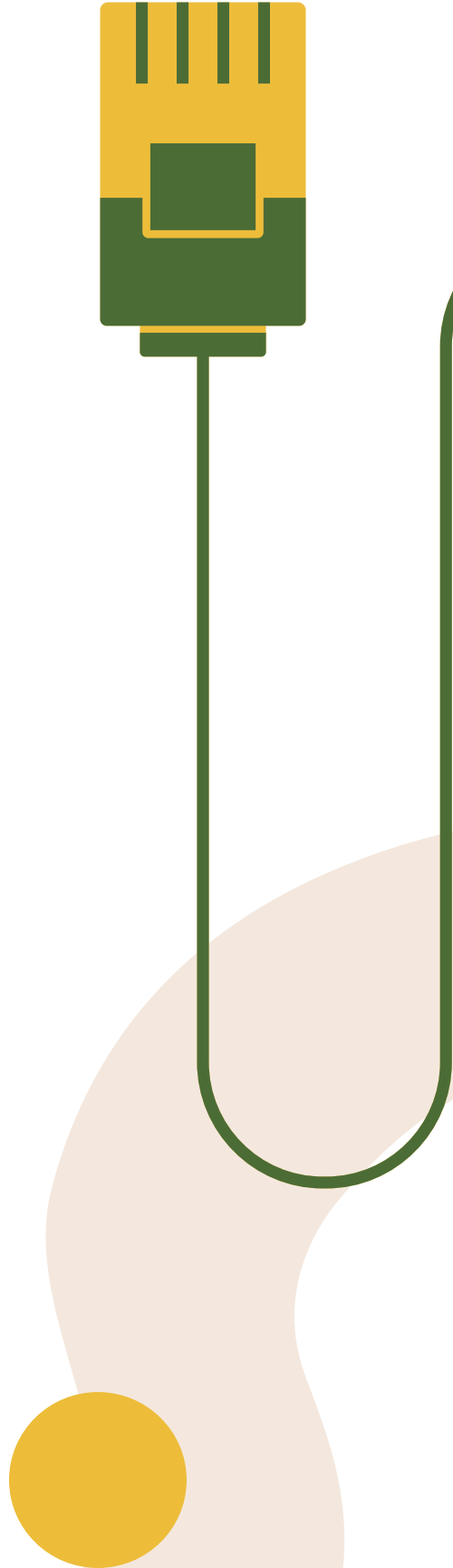**03** FRANI for government/private sector partnerships
FRANI as a Social Enterprise

Final Thoughts...

FRANI will be a cost effective, valid, accurate dietary measurement tool

FRANI will be ready for scaling up