GLOBAL NEEDS FOR FOOD MATCHING TOOLS AS IDENTIFIED THROUGH THE INDDEX PROJECT

Catherine Leclercq
Food and Agriculture Organization of the United Nations
on behalf of the INDDEX team

Presentation

- The INDDEX project

- Updates from INFOODS

- Data collection and collation initiatives involving food matching within the INDDEX project

- Requisites of a food matching module to be used at global level

- Questions from the INDDEX team to the Richfields Workshop participants…

THE INDDEX PROJECT

INTERNATIONAL DIETARY DATA EXPANSION PROJECT

INDDEX

January 2015 – December 2018

http://inddex.nutrition.tufts.edu/

Tufts UNIVERSITY | GERALD J. AND DOROTHY R. Friedman School of Nutrition Science and Policy

Food and Agriculture Organization of the United Nations

INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE — IFPRI

Bill & Melinda Gates Foundation

Global Development, Nutrition

- **Goal**: To ensure that all women and children have the nutrition they need to live healthy and productive lives

- **Strategy**: Invest in proven and novel approaches to improving nutrition; relevant areas include:
  - *Improving data systems*
  - Increasing advocacy and technical assistance
  - Strengthening food systems

- **Focus** on data, analytics, and evidence

http://www.gatesfoundation.org/What-We-Do/Global-Development/Nutrition

INDDEX team

Jennifer Coates, PhD
Principal Investigator

Beatrice Rogers, PhD
Co-Principal Investigator

http://inddex.nutrition.tufts.edu/about/core-partners

Pauline Allemand, MS, M.Eng

Nutrition Consultant

Food and Agriculture Organization of the United Nations (FAO)

Cristina Álvarez, MSc

Nutrition Consultant

Food and Agriculture Organization of the United Nations (FAO)

Agnieszka Balcerzak, MSc

Nutrition Consultant

Food and Agriculture Organization of the United Nations (FAO)

Winnie Bell, MS, MPH

Assistant Researcher

Tufts University

Odilia Bermudez, PhD, MPH

Associate Professor

Tufts University

Carlo Cafiero, PhD

Senior Statistician and Economist

Food and Agriculture Organization of the United Nations (FAO)

Ruth Charrondière, PhD

Nutrition Officer

Food and Agriculture Organization of the United Nations (FAO)

Cathleen Cissé, MPH

Project Manager

Tufts University

Brooke Colaiezzi, MS

Assistant Researcher

Tufts University

http://inddex.nutrition.tufts.edu/about/core-partners

John Fiedler, PhD

Senior Research Fellow

International Food Policy Research Institute (IFPRI)

Zachary Gersten, MPH

Project Coordinator

Tufts University

Rosalind Gibson, PhD

Emeritus Professor, University of Otago

Fernanda Grande, MS

Food Composition Consultant

Food and Agriculture Organization of the United Nations (FAO)

Catherine Leclercq, PhD

Nutrition Officer

Food and Agriculture Organization of the United Nations (FAO)

Warren T K Lee, PhD, RD, R.Nutr

Senior Nutrition Officer and Group Leader

Food and Agriculture Organization of the United Nations (FAO)

Ana Moltedo, MSc

Food Security and Nutrition International Consultant

Food and Agriculture Organization of the United Nations (FAO)

Dena Metili Mwangi, MA

Research Analyst

International Food Policy Research Institute (IFPRI)

Nathalie Troubat, MS

Food Security and Nutrition Officer

Food and Agriculture Organization of the United Nations (FAO)

Anna Vincent, MS

Food Composition Consultant

Food and Agriculture Organization of the United Nations (FAO)

8

http://inddex.nutrition.tufts.edu/about/core-partners

INDDEX Technical Advisory Group

Gero Carletto, PhD

Manager, Surveys and Methods Unit and Living Standards Measurement Study (LSMS), Development Research Group, The World Bank

Elaine Ferguson, PhD

Senior Lecturer, London School of Hygiene and Tropical Medicine

Fabio Grita

CountrySTAT team leader and coordinator **FENIX Platform** Statistics Division, Food and Agriculture Organization

Yves Martin-Prevel, MD, PhD

Epidemiologist in Public Nutrition, Institut de Recherche pour le Développement (IRD)

Mourad Moursi, PhD

Research Fellow HarvestPlus/International Food Policy Research Institute (IFPRI)

Marie Ruel, PhD

Director, Poverty, Health and Nutrition Division, IFPRI

Nadia Slimani, MD, PhD

Group Head, Dietary Exposure Assessment Group (DEX) Nutrition and Metabolism Section (NME) International Agency for Research on Cancer

Anne Swindale, PhD

Senior Program Adviser M&E, Bureau for Food Security, United States Agency for International Development

http://inddex.nutrition.tufts.edu/about/technical-advisory-group

INDDEX Overview

- Dietary data scarcity, high cost, inaccessibility, low quality, and under-use have long impaired effective food, nutrition, and agricultural policy and programming.

- INDDEX aims to remedy a situation that, for far too long, has been considered 'too difficult', or 'too costly' to address, even in the face of unambiguous need.

INDDEX Primary Outcomes

- "Target countries are better able to collect and analyze food intake data and make data-driven decisions about food, nutrition, and agriculture programs and policies"

- "The global public goods created under the project are maintained, accessible, and used by an expanding set of countries for making data-driven decisions about food, nutrition, and agriculture programs and policies"

INDDEX Four Objectives

- **Objective I:** Streamlining the Collection, Analysis, and Use of Individual-Level Dietary Data

- **Objective II:** Building the Evidence Base for 'Better Practices' of Household Consumption and Expenditure Survey (HCES) Design

- **Objective III:** Increasing the Use of Dietary Data to Guide Agriculture and Nutrition Policies and Programs

- **Objective IV:** Stimulating Global Cooperation and Country Capacity for Improved Acquisition and Use of Dietary Data

UPDATES FROM INFOODS

International Network of Food Data Systems (INFOODS)

- Established in 1984

- Under FAO and UNU (United Nations University) and is a IUNS (International Union of Nutritional Sciences) Task Force

- 11 regional centres; global coordination since 1999 at FAO

- Objective: to stimulate and coordinate efforts to improve the quality and availability of food analysis data worldwide

INFOODS Activities

- Standards & Guidelines
  - INFOODS Guidelines for Describing Foods
  - INFOODS Food Component Identifiers (Tagnames)
  - Guidelines for Food Matching (2012)
  - Guidelines for Converting Units
  - Guidelines for Checking Food Composition data prior to Publication
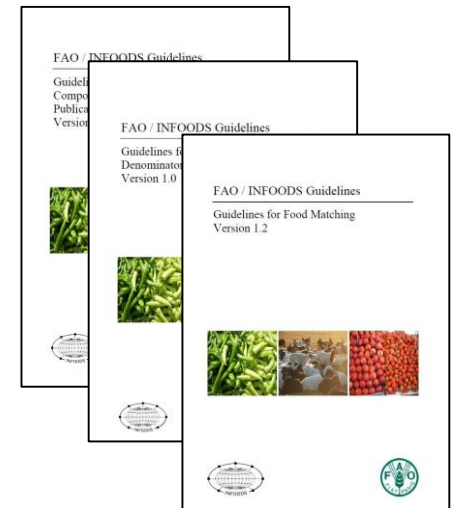
INFOODS Activities

- Food Composition Training
  - Study Guide (Distance education)
  - E-learning course
- Food biodiversity
- Tables and databases
  - Food Composition Database for Biodiversity
  - Analytical Food Composition Database
  - West African Food Composition Table *(funded through INDDEX)*
  - Global Pulses Database (2016)
  - Global database on Fish and Shellfish (2016)
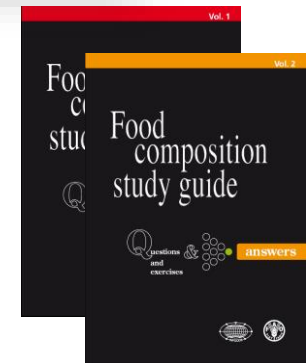
DATA COLLECTION AND COLLATION INITIATIVES INVOLVING FOOD MATCHING WITHIN THE INDDEX PROJECT

- □ INDDEX DIETARY ASSESSMENT TOOL
- □ FAO/WHO GIFT
- □ ADePT-FSM

INDDEX dietary assessment tool

Plans:

☐ Conduct two country-level scoping trips (needs, capacity, and stakeholder assessments)

☐ Development of a prototype

☐ Feasibility assessments and potential validation study

☐ Develop guidance and training materials for individual-level dietary data collection and processing

☐ Provide country-level training and ongoing technical assistance on dietary data collection, analysis, and use

Global Individual Food consumption data Tool (FAO/WHO GIFT)
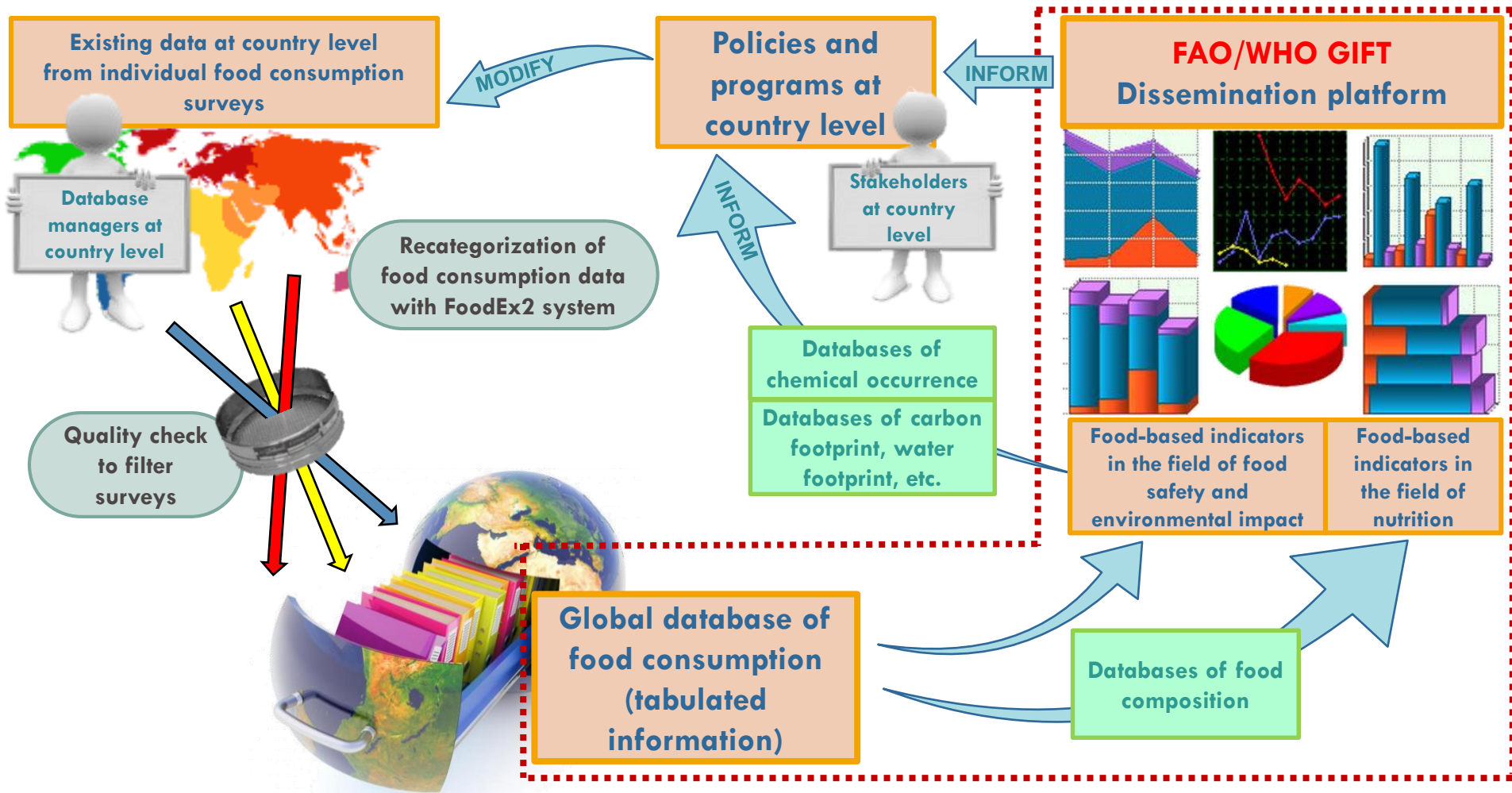
Datasets in FAO/WHO GIFT prototype

	Bangladesh HP/UC Davis	Burkina Faso HP/IRD	Philippines HP/FNRI	Uganda HP
Year	2007 – 2008	2010	2003	2007
Environment	Rural	Rural	Urban + Rural	Rural
Method	12h direct observation + repeated 24h recall	Repeated 24h recall	Repeated 24h recall	Repeated 24h recall
Population	Women 19-50y + children 24-48m	Women 15-50y + children 36-59m	Women 15-50y	Women 15y at least + children
Sample size — **Women**	475	480	1206	577
Sample size — **Children**	529	480	-	-
Nb of food items (actually consumed)	231	273	155	355

FAO/WHO GIFT Dissemination platform

Prototype FAO/WHO GIFT Dissemination platform

ADePT-FSM

- ADePT – Food Security Module (ADePT-FSM) is a **free software** developed by FAO in collaboration with the World Bank to support countries in **processing food consumption data from National Household Surveys** and generating food security indicators.

- If the food consumption module inserted into a National Household Survey is properly designed, data can be used to **derive a variety of food security and nutrition indicators**

- ADePT-FSM provides food security statistics at national and sub national level

http://www.fao.org/economic/ess/ess-fs/fs-methods/adept-fsn/en

ADePT-FSM
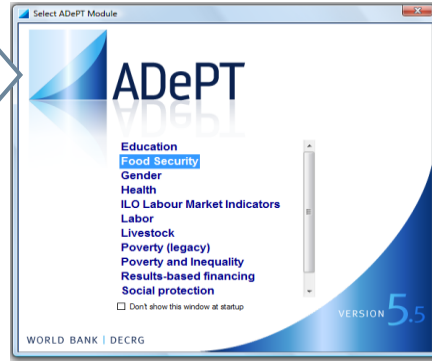

FROM HOUSEHOLD BUDGET SURVEYS

We build three files

Food consumption data

Household characteristics

Household members demographic and socio economic characteristics

Creation of the input files

FROM REFERENCE FOOD COMPOSITION TABLES

We build one file

Survey specific nutrient table

Food matching

Execution of ADePT-FSM

65 output tables

Creation of the output tables

http://www.fao.org/economic/ess/ess-fs/fs-methods/adept-fsn/en

Some ADEPT-FSM output Statistics

Calories and nutrients consumption by item groups:

	A	B	C	D	E	F
1		4.1 Food consumption by food commodity groups				
2		Average monetary value of food consumption, LCU/person/day	Average dietary energy consumption, kcal/person/day	Average food protein consumption, g/person/day	Average available carbohydrates consumption, g/person/day	Average fat consumption, g/person/day
3	food item group					
4	CEREALS	2.5	1245	30.6	232.9	17.2
5	ROOTS AND TUBERS	0.1	20	0.7	3.9	0.0
6	SUGARS AND SYRUPS	0.4	239	0.0	59.8	0.0
7	PULSES	0.3	114	8.3	16.2	0.4
8	TREE NUTS	0.0	3	0.1	0.1	0.2
9	OIL CROPS					
10	VEGETABLES	0.6	27	1.1	4.2	0.3
11	FRUITS	0.7	105	1.3	19.1	2.0
12	STIMULANTS	0.1	0	0.0	0.0	0.0
13	SPICES	0.0	0	0.0	0.0	0.0
14	ALCOHOLIC BEVERAGES	0.1	3	0.0	0.1	0.0
15	MEAT	1.6	101	9.2	0.3	7.0
16	EGGS	0.3	23	2.0	0.1	1.6
17	FISH	0.2	6	1.0	0.0	0.2
18	MILK AND CHEESE	0.6	57	3.3	3.7	3.2
19	OILS AND FATS (vegetable oils)	0.2	97	0.1	0.5	10.3
20	OILS AND FATS (animal fats)	0.0	4	0.0	0.0	0.4
21	NON ALCOHOLIC BEVERAGES	0.4	0	0.0	0.0	0.0
22	MISCELLANEOUS AND PREPARED FOOD	1.3	255	7.1	39.2	7.1

http://www.fao.org/economic/ess/ess-fs/fs-methods/adept-fsn/en

Some ADEPT-FSM output Statistics

Calories and food quantities consumption by food item:

	A	B	C	D	E
1	4.18 Food item dietary energy consumption at national level				
2		Edible quantity consumed, g/person/day	Monetary value, LCU/person/day	Dietary energy consumption, kcal/person/day	Dietary energy unit value, LCU/1000kcal
3	item_cod				
4	Rice quality 1 (good quality)	43.57	89.51	154.01	581.21
5	Rice quality 2 (bad quality)	297.22	490.10	1058.99	462.80
6	Other rice	2.63	6.14	9.30	660.01
7	Whole grain maize	0.05	0.16	0.18	852.07
8	Corn on the cob	1.44	4.38	2.30	1905.27
9	Other grains	1.26	1.28	4.53	281.82
10	Bread	0.12	0.63	0.39	1611.62
11	Wheat	0.01	0.07	0.04	1766.11
12	Other flours	0.09	0.31	0.32	954.82
13	Fermented rice noodles	1.65	2.58	1.74	1482.01
14	White rice/clear	0.18	0.57	0.64	881.58
15	Yellow noodles	0.51	3.49	1.90	1834.73
16	Others noodles	2.29	9.41	7.88	1194.55
17	Cakes, tarts, pies, quiches and pizzas	0.72	2.39	2.65	904.56
18	Other biscuit/cookies	9.45	26.94	43.48	619.61
19	Rice cakes	1.14	3.15	2.67	1180.30
20	Other traditional cakes	2.34	5.68	8.80	645.98
21	Other cereal preparations	0.51	1.75	1.86	940.66
22	Pork without fat	6.85	93.87	25.66	3657.79
23	Pork with fat	13.55	150.00	61.91	2422.64
24	Beef	7.00	87.29	9.27	9416.63

http://www.fao.org/economic/ess/ess-fs/fs-methods/adept-fsn/en

ADEPT-FSM indicators in FAOSTAT

http://faostat3.fao.org/download/D/HS/E

# REQUISITES OF A FOOD MATCHING MODULE TO BE USED AT GLOBAL LEVEL

Food composition databases (FCDB) in Low Income Countries

☐ Many Low Income Countries lack a national FCDB

☐ There is often missing information on foods, recipes, nutrient values, yield and retention factors

☐ Even when FCDB information exists, it may not easily accessible (not publicly available, only hard copies, not easy to import, etc)

Dietary surveys in Low Income Countries
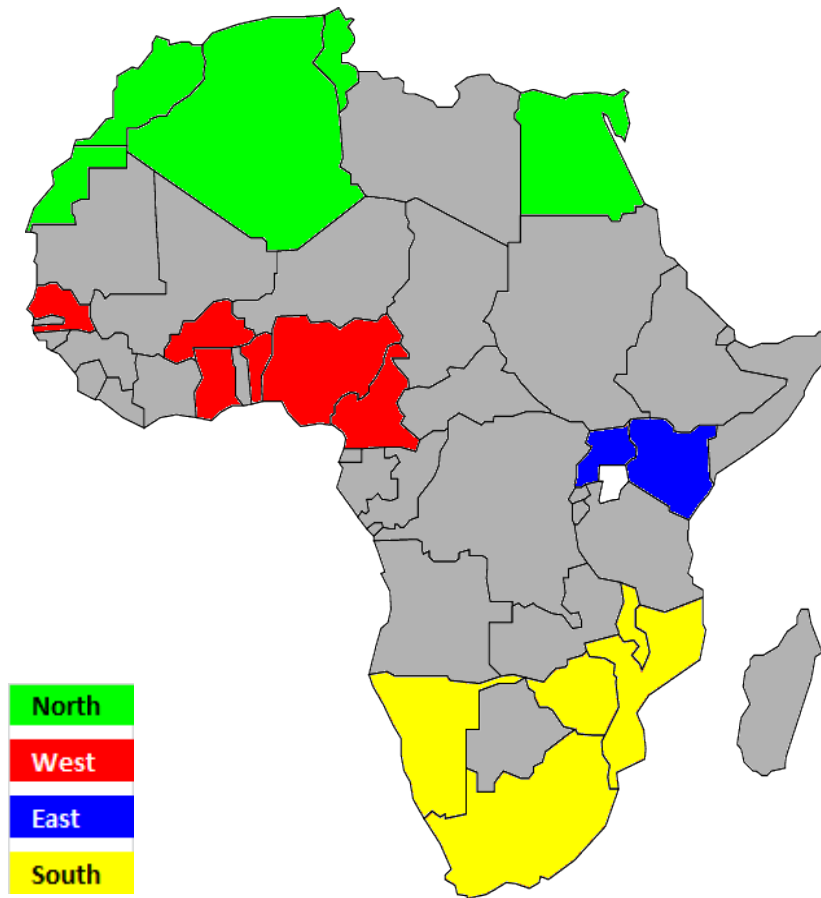
Dietary surveys performed in Low Income Countries are mainly small scale surveys

An inventory performed by the International Agency for Research on Cancer (IARC) identified 42 recent individual quantitative food consumption surveys in 17 African countries (ASPADAM project).

Source: Pisa et al., *Critical Reviews in Food Science and Nutrition*, 2014

Food matching today in Low Income Countries

- Food matching is currently done on an *ad hoc* basis for each initiative of data collection or data collation

This is not efficient in terms of time and resources.

- In Low Income Countries, even when some local food composition data exist, USDA food composition data are often used for food matching

This may lead to important errors in the assessment of intake of some key micronutrients (the composition of local foods may differ very significantly from that of US due to natural variability or to differing patterns of food fortification)

Potential uses of a food matching tool

- Estimate **per capita availability of nutrients at country level** based on Food Balance Sheets

- Estimate **per capita availability of nutrients at household level** based on household food consumption

- Estimate **nutrient intake by age and sex** based on dietary surveys

- **Plan nutritionally appropriate menus for catering** based on the nutrient composition of local foods

- Facilitates the presence of correct **nutrition facts labels** on foods

- perform **dietary exposure assessment based on** dietary surveys and databases of chemical occurrence

Important features of a food matching module

- Allow to assess the nutrient content of food as eaten considering the refuse factor (ration of edible quantity respect to purchased quantity), yield factor and nutrient retention factors

- Allow insertion of additional food description and categorization systems (e.g. country specific or specific for household surveys)

- Allow to match *ad hoc* grouping of food items (e.g "Radishes, beets, turnips" in a household survey), composite dishes, recipes

Key requisites of a food matching module to be used at global level

- Free of charge to users

- Developed as a plug-in* module to be used with a variety of data collation and data collection applications

- Makes use of an international food description and categorization system (e.g. FoodEx2)

- Automatized or semi automatized (through semantic search system)

- Very simple to use

> * software component that adds a specific feature to an existing computer program

QUESTIONS FROM THE INDDEX TEAM TO THE RICHFIELDS WORKSHOP PARTICIPANTS...

- Have some countries or organizations developed or intend to develop an automatic food matching module?

- Can existing food matching modules be used with a range of software applications?

- Can existing food matching modules be used by personnel with basic computer skills and without specialized knowledge in food composition?

THANK YOU!