



IANDA

New Indicators of the Cost of Nutritious Diets

Anna Herforth, Ph.D.
Project Director, IANDA
8 August 2017

Indicators Developed

- Absolute cost:
 - Cost of Nutrient Adequacy (CoNA)
 - Cost of a Recommended Diet (CoRD)

- Indexes:
 - Nutritious Food Price Index (NPI)
 - Cost of a Diverse Diet (CoDD)

CoNA: Cost of Nutrient Adequacy

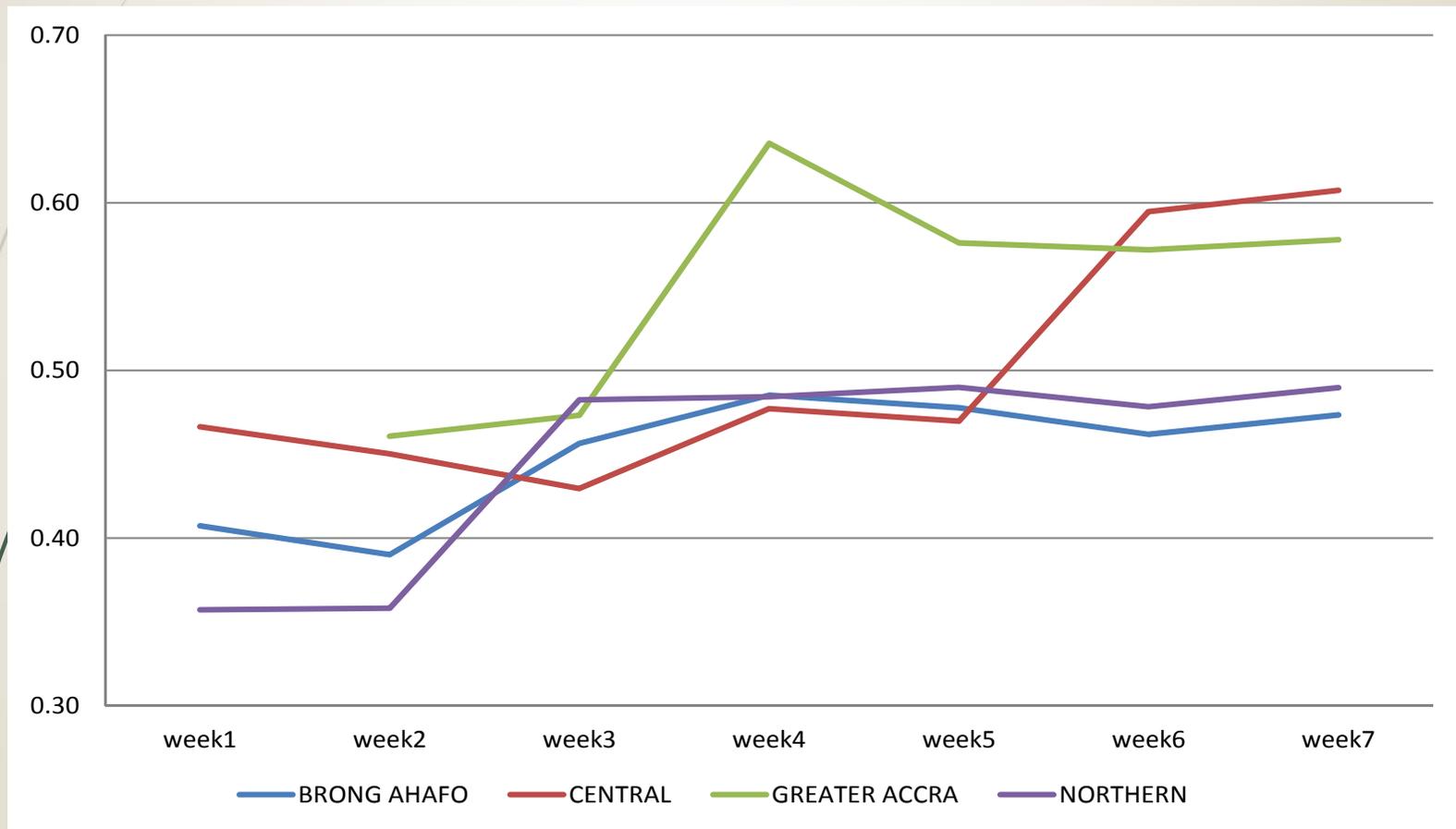
- CoNA shows the minimum cost of achieving minimum nutrient adequacy, with no other dietary constraints.
 - It also shows which nutrients are the most constraining, and the foods which contribute most to meeting each nutrient requirement.
- Linear programming method
- Requires
 - (1) food prices for a diversity of foods
 - (2) nutrient requirement data (EARs)
 - Estimate Average Requirement: The level at which 50% of the population meets nutrient needs
 - (3) food composition data

Results based on MoFA Pilot Data

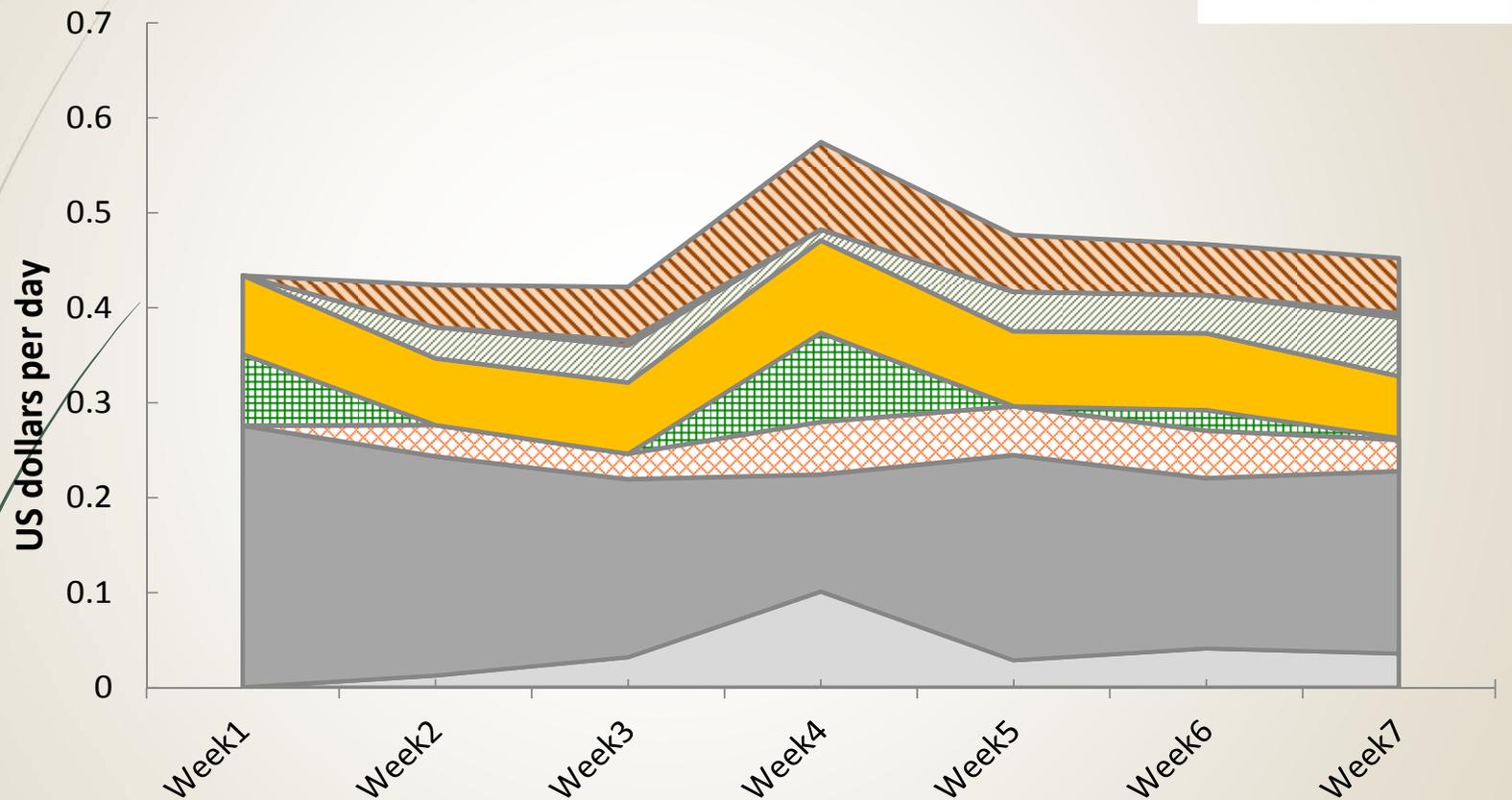
- Nov 2016-Jan 2017
- Markets
 - Greater Accra (4 markets)
 - Central (Mfantseman district)
 - Northern (Tamale district)
 - Brong Ahafo (Techiman district)

CoNA: GHC1.7-2.5 (USD \$0.40-0.60)

Minimum Cost of Nutrient Adequacy per 2000kcal per day by Region (USD)

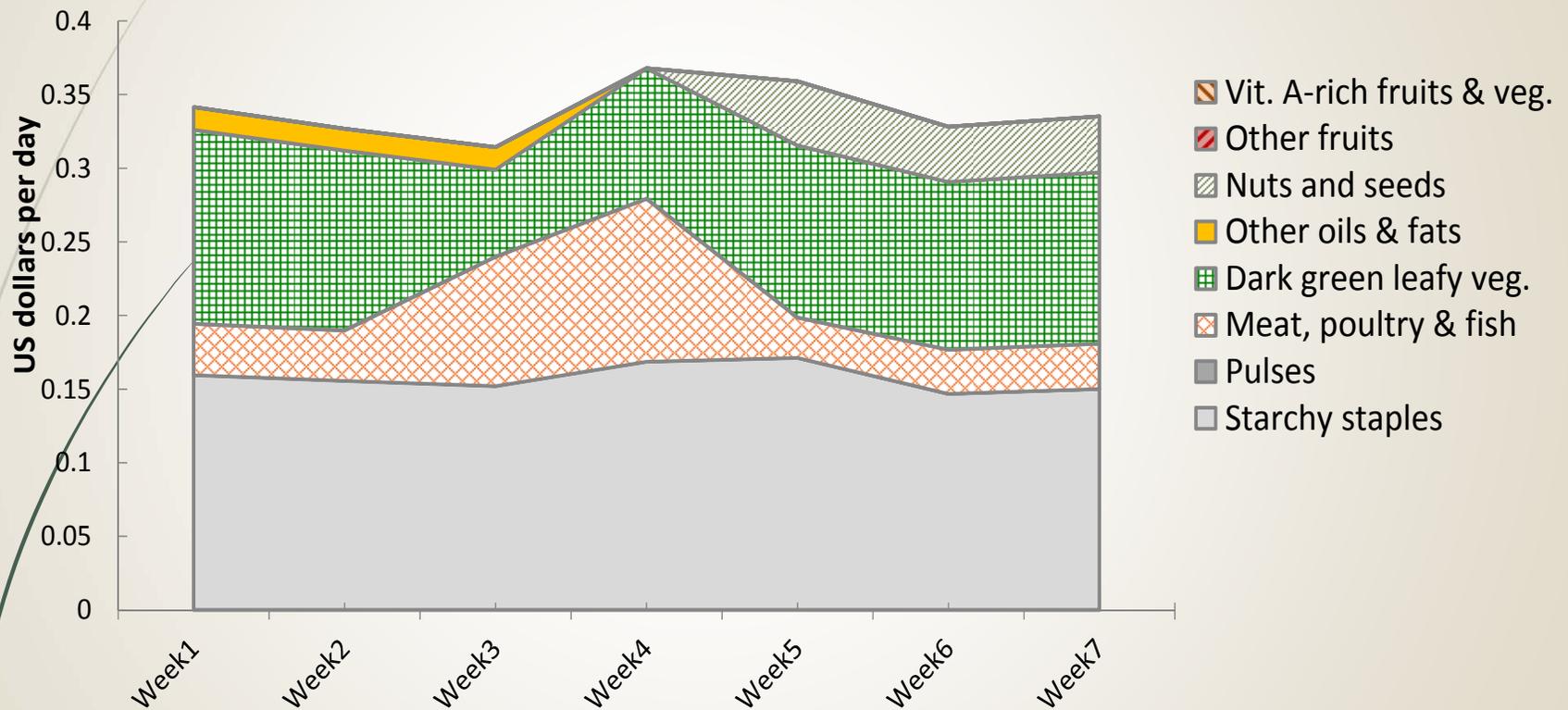


Greater Accra: Soyabeans would dominate a fairly diverse diet

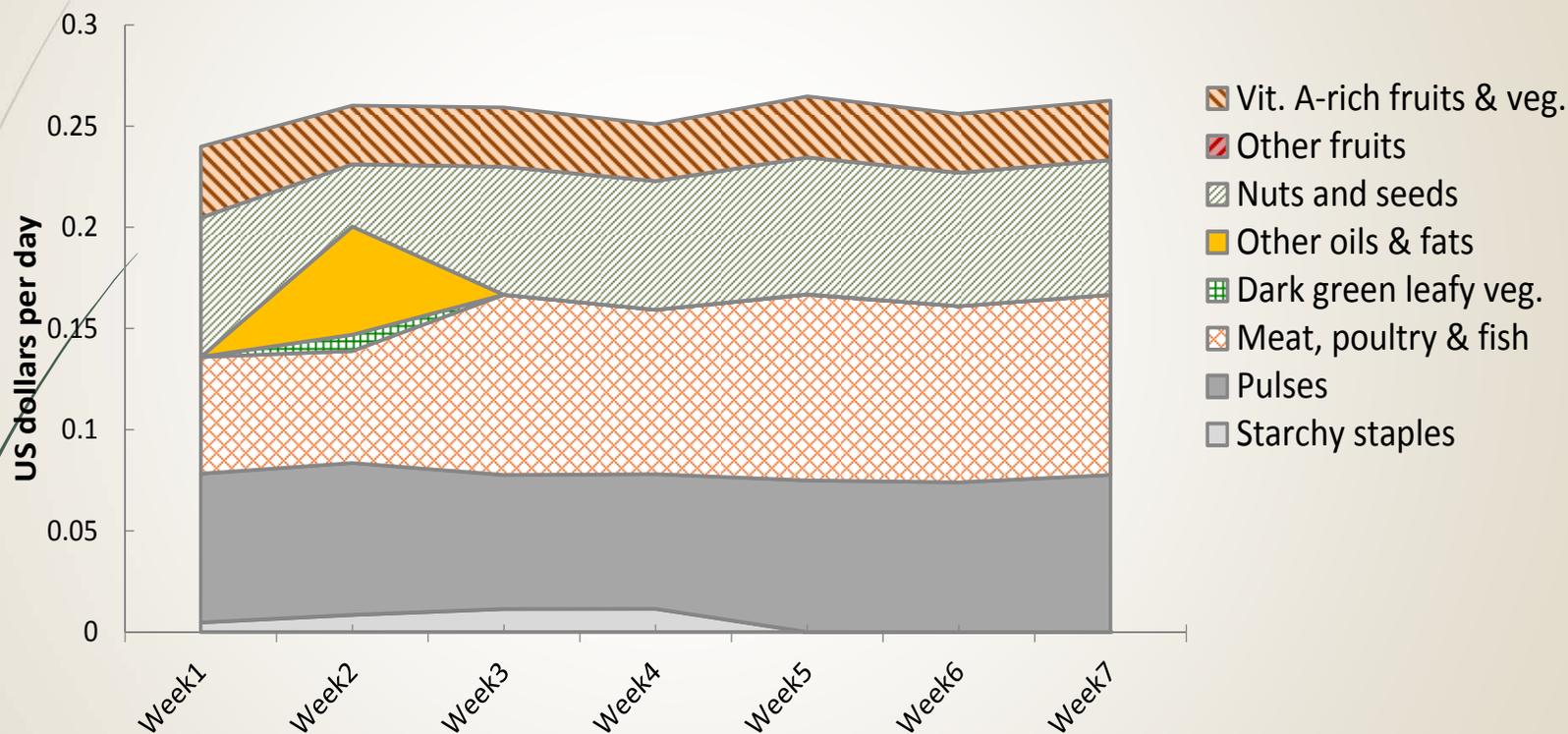


Note: most items come from the expanded food list!

Central Region: Cassava, Nkontomire, and smoked herring

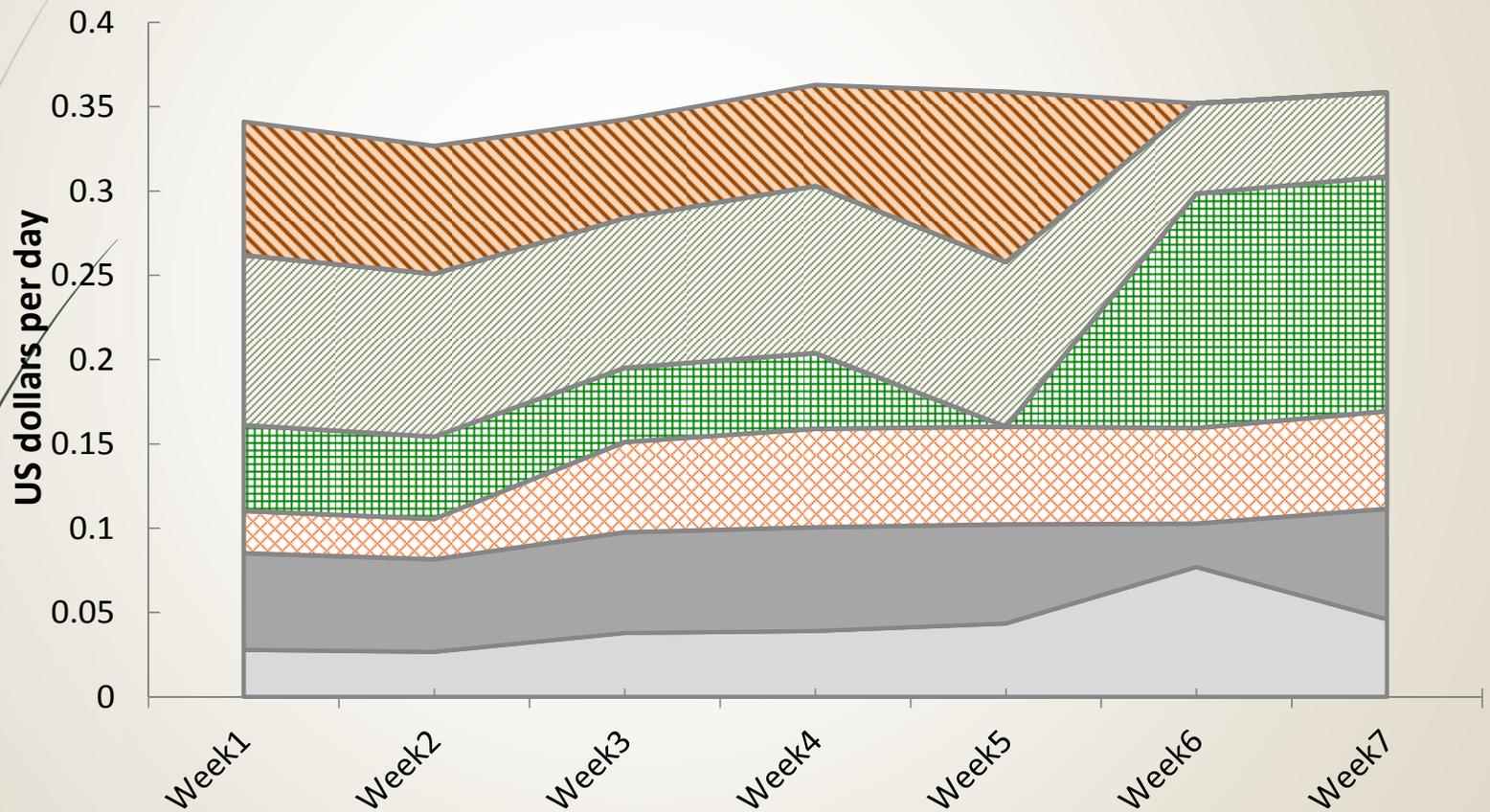


Northern Region: Soyabean, Salmon, Groundnut, OFSP



Brong Ahafo: 6 important food groups (carrots!)

- Vit. A-rich fruits & veg.
- Other fruits
- Nuts and seeds
- Other oils & fats
- Dark green leafy veg.
- Meat, poultry & fish
- Pulses
- Starchy staples



Most constraining nutrients - Ghana

- Vitamin B12
- Vitamin E

- Calcium
- Vitamin C
- Vitamin A

- Does not mean that deficiencies of these are prevalent, just that they are most expensive



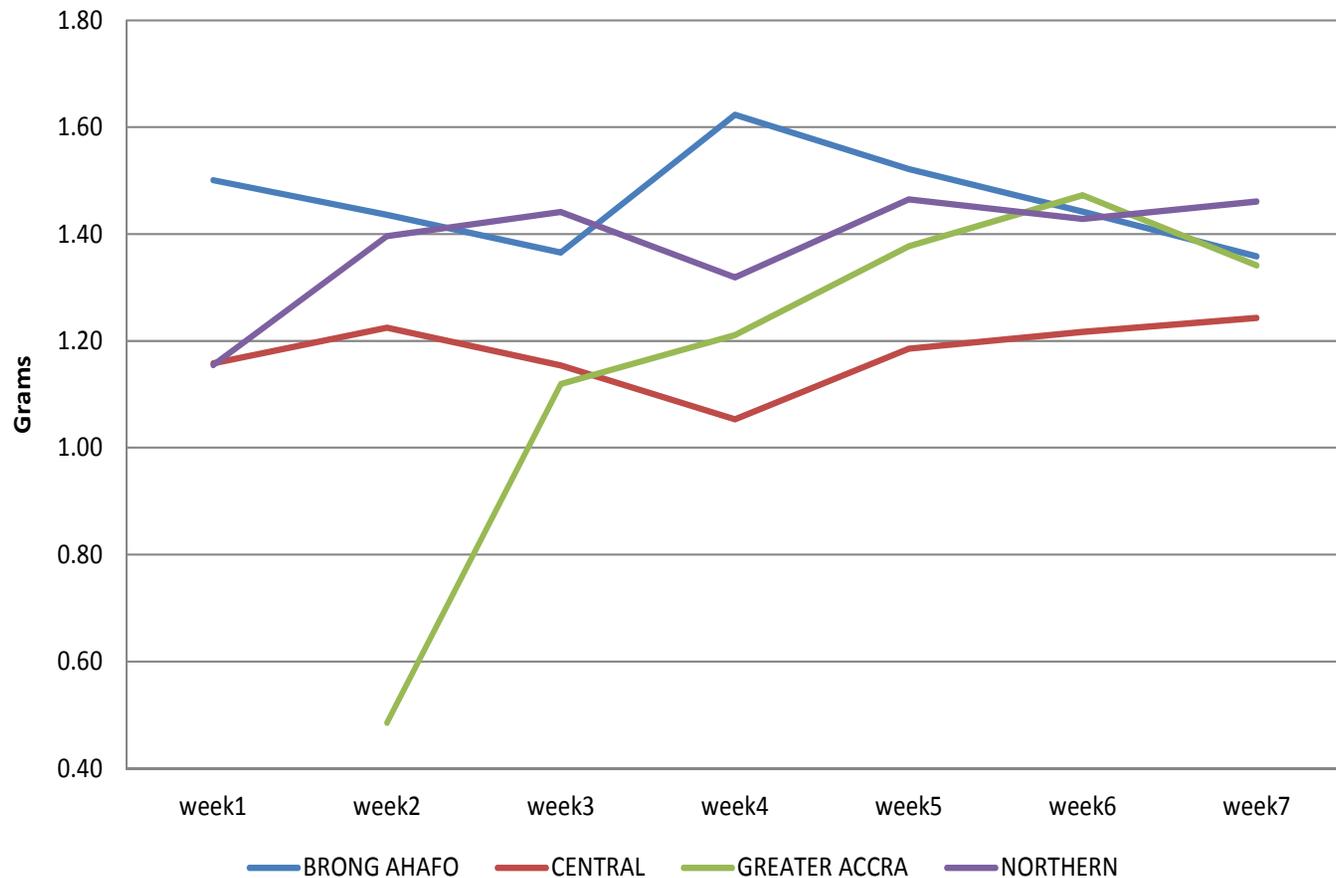
Q. What if the dataset has fewer foods?

A. You get worse results.

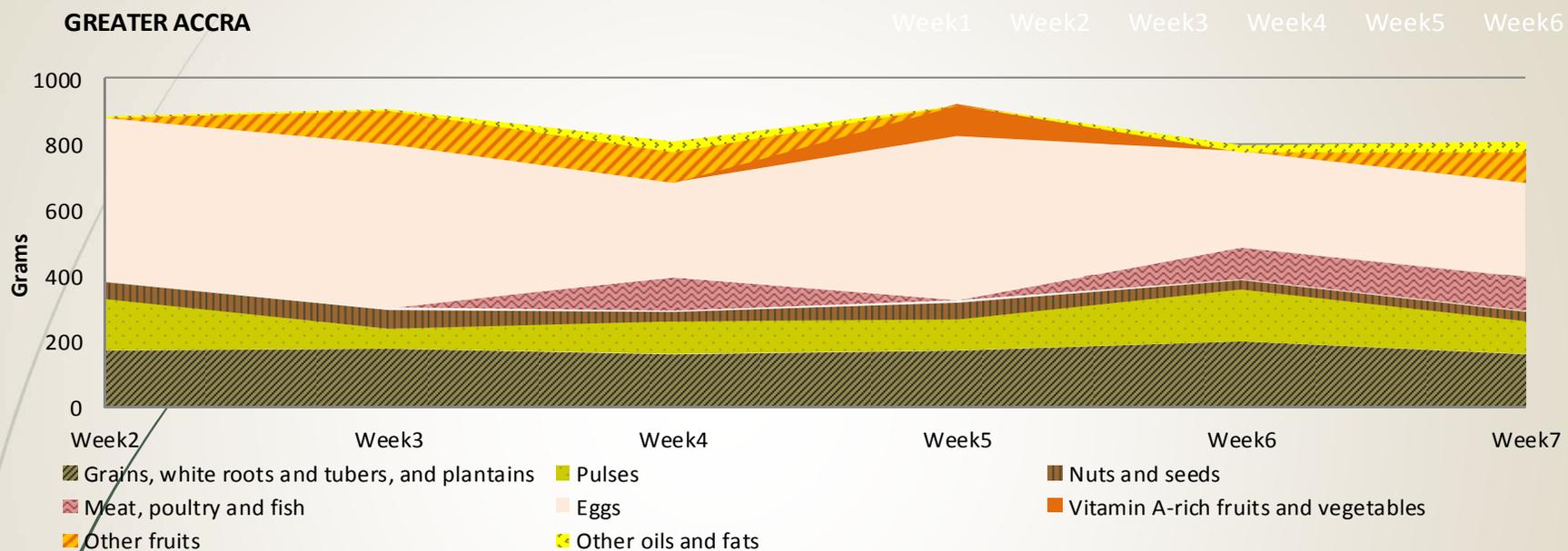
Demonstration: Results using previous MoFA data

With fewer foods represented in the data, it appears much more expensive to attain nutrient adequacy (**4x as expensive**)

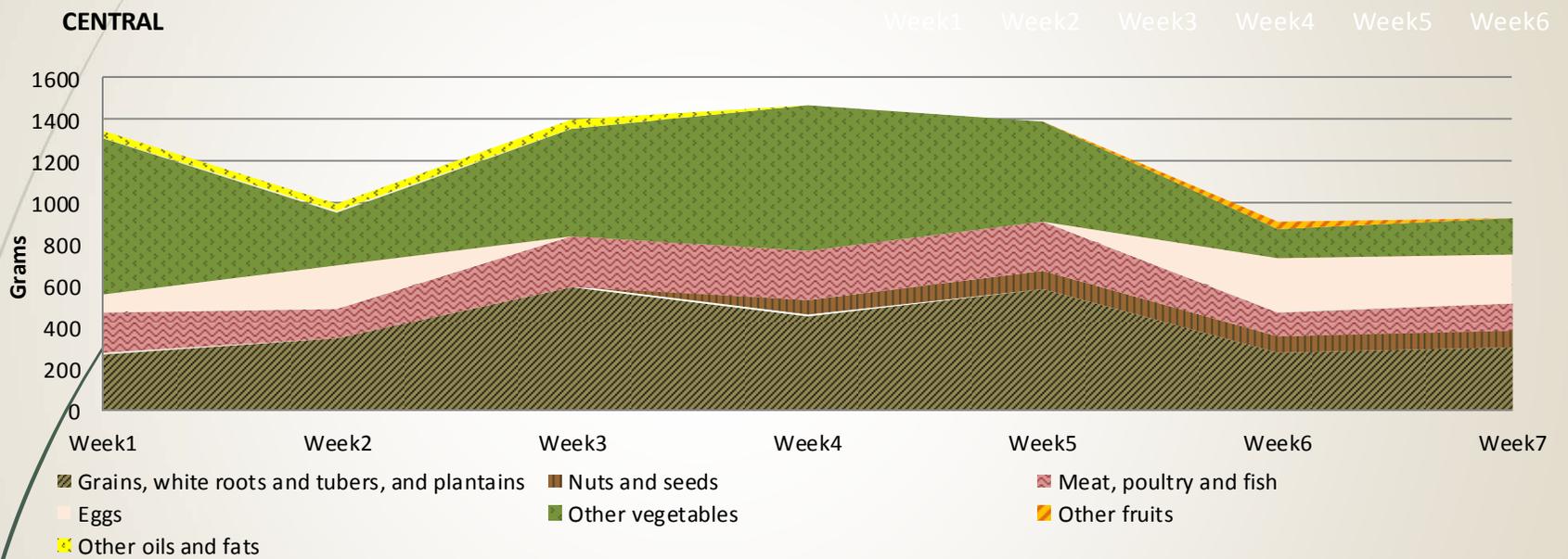
Minimum Cost of Nutrient Adequate Diets per 2000kcal per day by Regions (in USD)



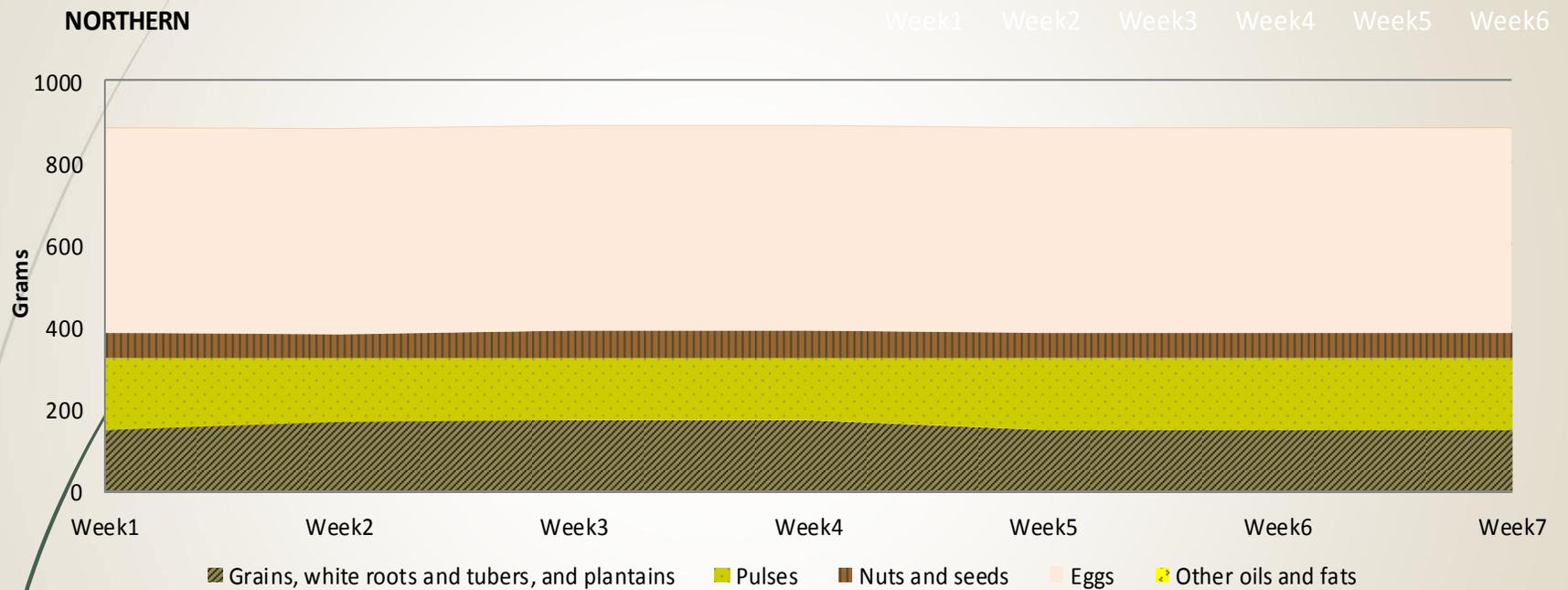
Accra: 5 eggs a day!



Central region: Cassava and a mountain of Okra (430g/day) *(green leafy veg missing from the data)*



Northern region: Half a dozen eggs/day, with soybean and sweet potato (no OFSP in dataset)



Food diversity in the data matters

- ▶ Results are implausible with the old data; the erroneous conclusion is that it is not feasible, nor affordable, to consume adequate nutrients
 - ▶ --> erroneous policy decision that supplements are necessary
- ▶ Results are more realistic, and affordable, with the expanded food list
 - ▶ Fairly well-balanced in terms of amounts, but not always diverse enough
- ▶ **How to get even more realistic results?**
 - ▶ Look at overall recommended diets, not just nutrients.

CoRD: Cost of Recommended Diet

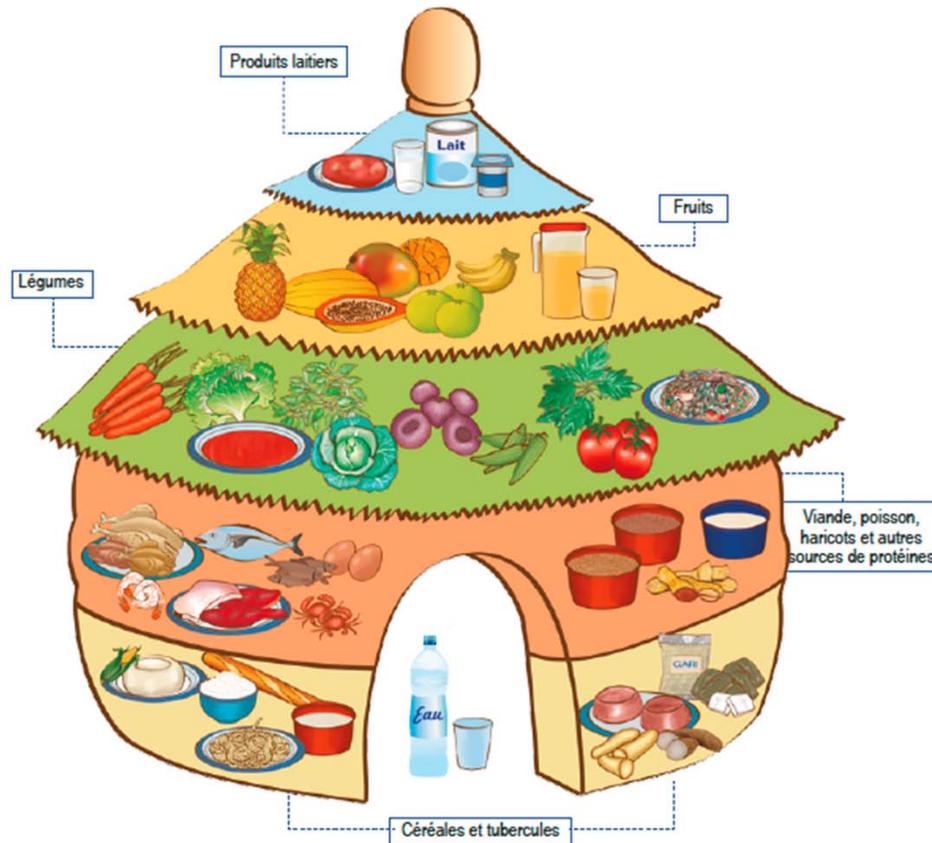
- Total cost of meeting food-based dietary guidelines (FBDGs)
 - designed to provide both nutrient adequacy and prevention of diet-related non-communicable disease within a culturally-acceptable diet
- The most intuitive way to understanding economic access to adequate food. It can also show which food groups are most expensive.
- First problem: What *is* a recommended diet?



République du Bénin
Fraternité – Justice – Travail
CONSEIL NATIONAL
DE L'ALIMENTATION ET
DE LA NUTRITION (CAN)



Guide alimentaire du **Bénin**



GROUPES D'ALIMENTS ESSENTIELS

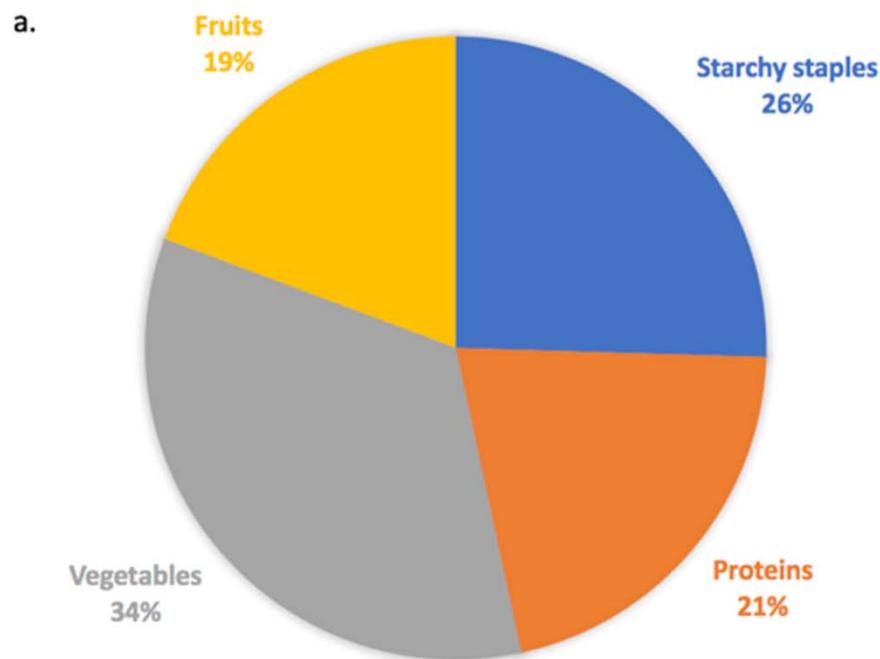
<http://poledfn.org>

Cost of Recommended Diet (CoRD) Method

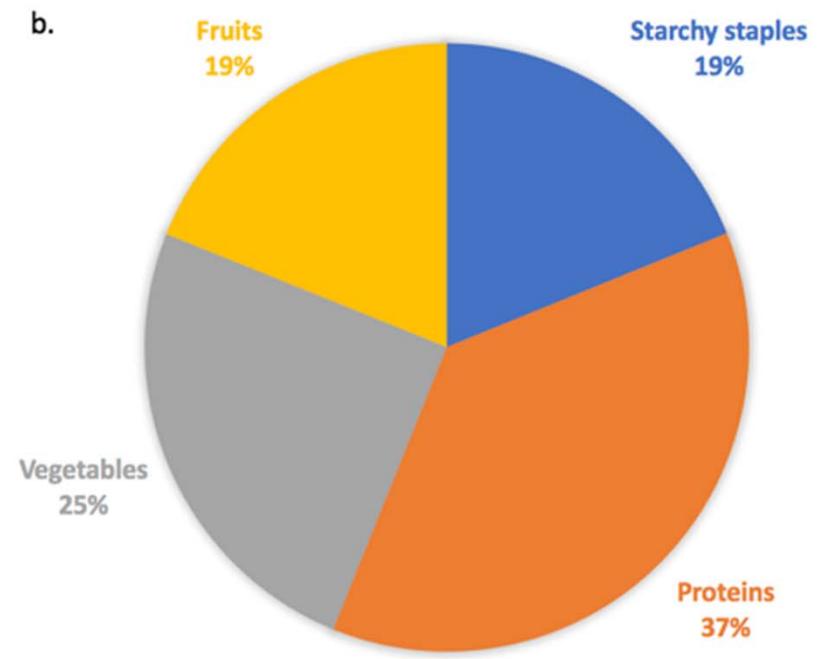
- Group all items in food list into food groups
- Two options
 - CoRD 1: Take the lowest-cost items
 - allowing for diversity/variety in recommendations: lowest-cost 3 fruits and vegetables, lowest-cost 2 starches and proteins
 - CoRD 2: Take the median cost of all items in each food group
- Multiply that cost by the number of servings (converted into grams or calories, as relevant)
- Add up cost of all food groups.
 - Useful to say “This is what it costs right now to eat a recommended diet.”
- This has been done in previous papers looking at cost of achieving dietary guidelines (in USA), but has not been used as a policy-relevant indicator, as IANDA is doing.

CoRD: GHC 3.1-5.6 excluding dairy (USD \$0.75-1.35)

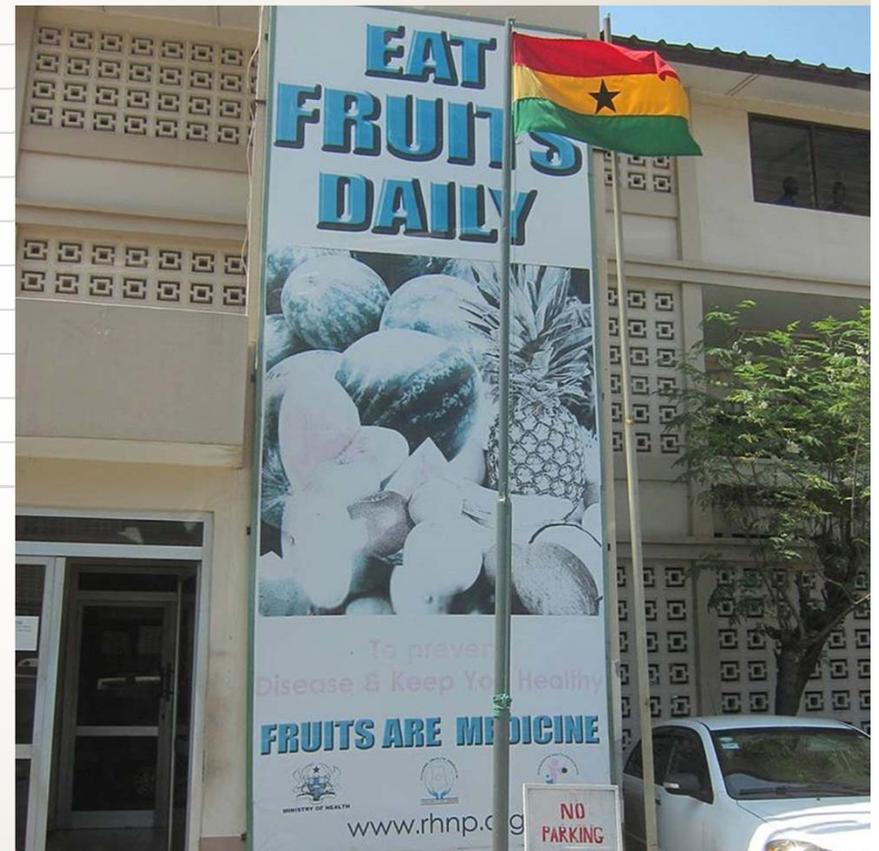
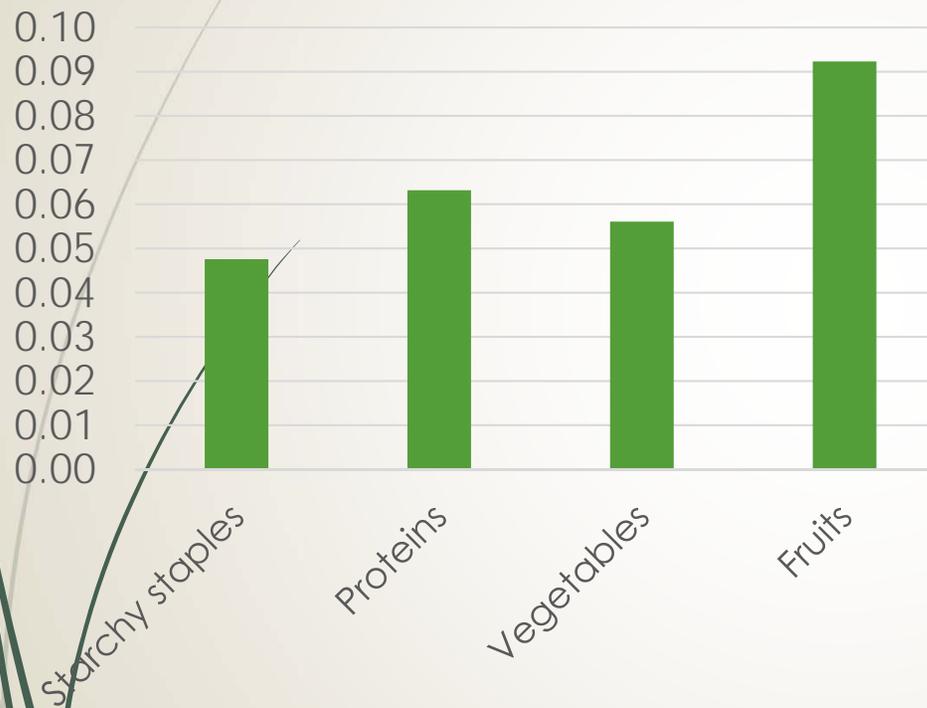
Panel a. Lowest-cost item in each category (\$0.75/day)



Panel b. Median-cost item in each category (\$1.35/day)



Cost per serving: Lowest cost (USD)



Nutritious Food Price Index (NPI)

- ▶ CPIs use economic weights: food items are weighted according to the proportion of income spent on them.
 - ▶ Out of every \$100 spent on all purchases (food and non-food), the weight is the \$ spent on that particular item.
 - ▶ Food is very important in national CPIs because in Ghana it accounts for 42% of all expenditures.
- ▶ The GSS food list is quite comprehensive.
 - ▶ 82 items; All food groups covered.
- ▶ NuVal scores can be used as alternative weights to construct a food price index that up-weights more nutritious foods and down-weights less nutritious foods
- ▶ Requires: (1) food CPI data (2) NuVal scores

NuVal scores

- A score of “overall nutritional quality” from 1-100
 - All fresh fruits and vegetables get 100.
 - Certain components downgrade nutritiousness (added sugars, salts, saturated fat, cholesterol)
 - Added nutrients upgrade nutritiousness
- Used in some grocery stores in the United States to indicate to consumers which products are overall more nutritious.
- Algorithm not public

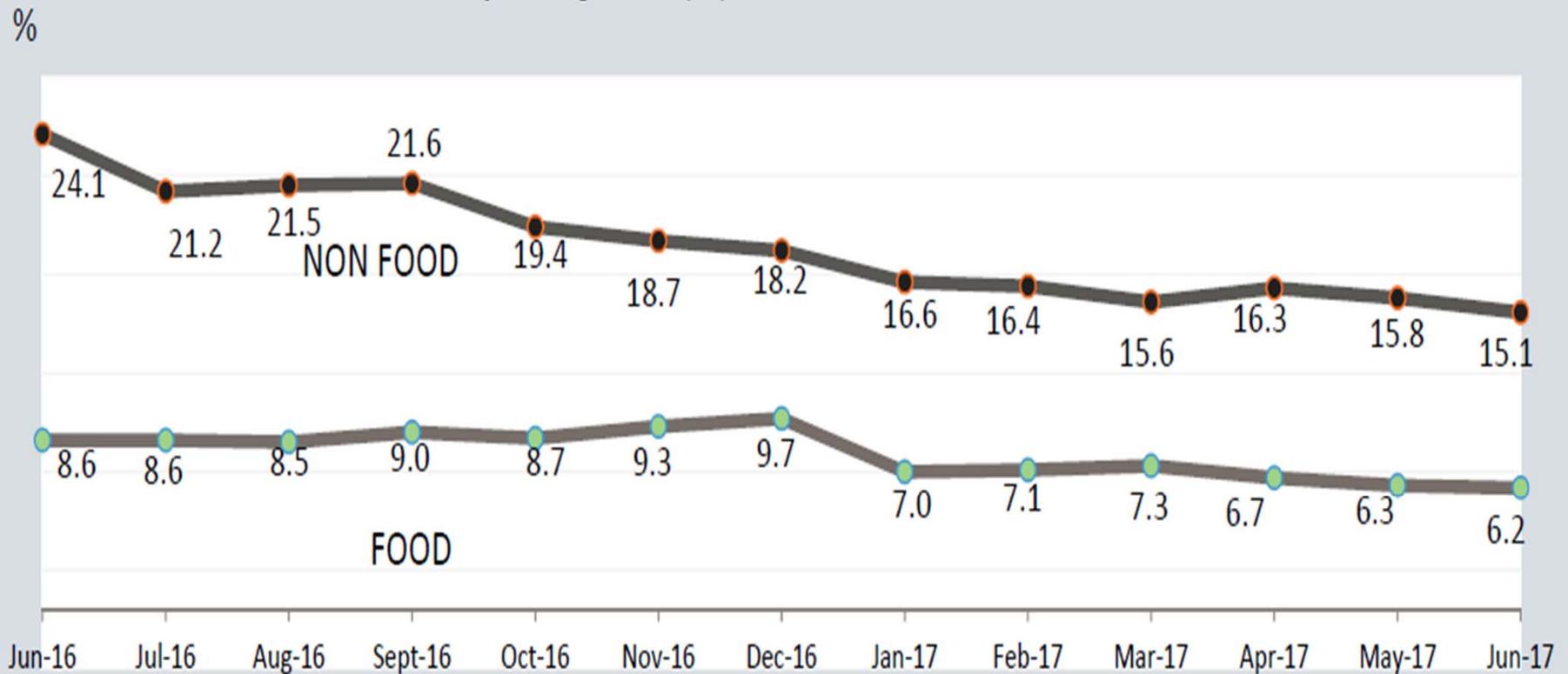


 37 NuVal	 91 NuVal	Clear information that is quickly understood
 23 NuVal	 52 NuVal	Guidance in every category of the store, even snacks.
 30 NuVal	 96 NuVal	Advice that aligns with expert opinion.



FOOD and NON-FOOD INFLATION, June 2016 to June 2017

Yearly change rate (%)



Ghana Statistical Service

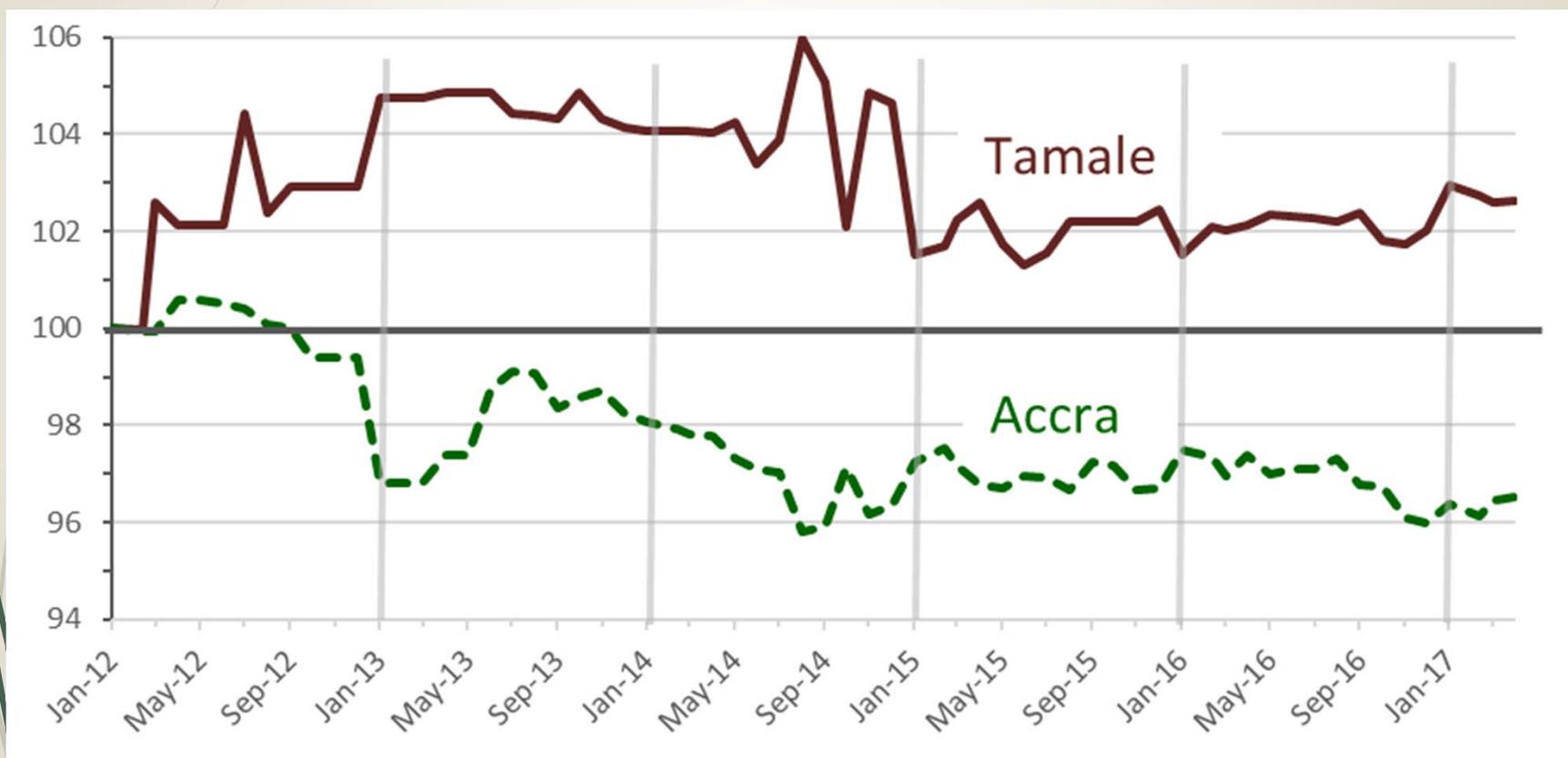
Nutritious Food Price Index

GHANA STATISTICAL SERVICE data		
PRODUCTS	Expenditure Weights	Nutritional Quality Weights
<i>Food</i>	100	100
Cereals and cereal products	25.55	
Meat and meat products	9.10	
Fish and sea food	22.93	
Milk, cheese and eggs	4.33	
Fruits	4.29	
Vegetables	23.36	
Oils and fats	5.19	
Sugar, jam, honey, chocolate and confectionery	2.29	
Mineral water, soft drinks, fruit and vegetable juices	3.57	
Food products n.e.c.	1.95	
Non-alcoholic beverages	5.57	
Coffee, tea and cocoa	2.00	

Nutritious Food Price Index

GHANA STATISTICAL SERVICE data		
PRODUCTS	Expenditure Weights	Nutritional Quality Weights
<i>Food</i>	100	100
Cereals and cereal products	25.55	19.43
Meat and meat products	9.10	8.55
Fish and sea food	22.93	14.12
Milk, cheese and eggs	4.33	5.50
Fruits	4.29	14.64
Vegetables	23.36	32.67
Oils and fats	5.19	0.86
Sugar, jam, honey, chocolate and confectionery	2.29	0.24
Mineral water, soft drinks, fruit and vegetable juices	3.57	0.45
Food products n.e.c.	1.95	2.45
Non-alcoholic beverages	5.57	2.50
Coffee, tea and cocoa	2.00	2.05

Nutritious-food price index (NPI) relative to food CPI in two regions of Ghana, Jan. 2012-April 2017



CoDD: Cost of Dietary Diversity

- The CoDD indicator provides an index of the cost of meeting MDD-W
 - CoDD helpful to understand as a precursor to increasing MDD-W – aim to stabilize the cost of bare minimum dietary diversity
 - Also shows relative prices and volatility of each food group
- Requires
 - Food price data for each of the 10 MDD-W groups

Minimum Dietary Diversity – Women (MDD-W)

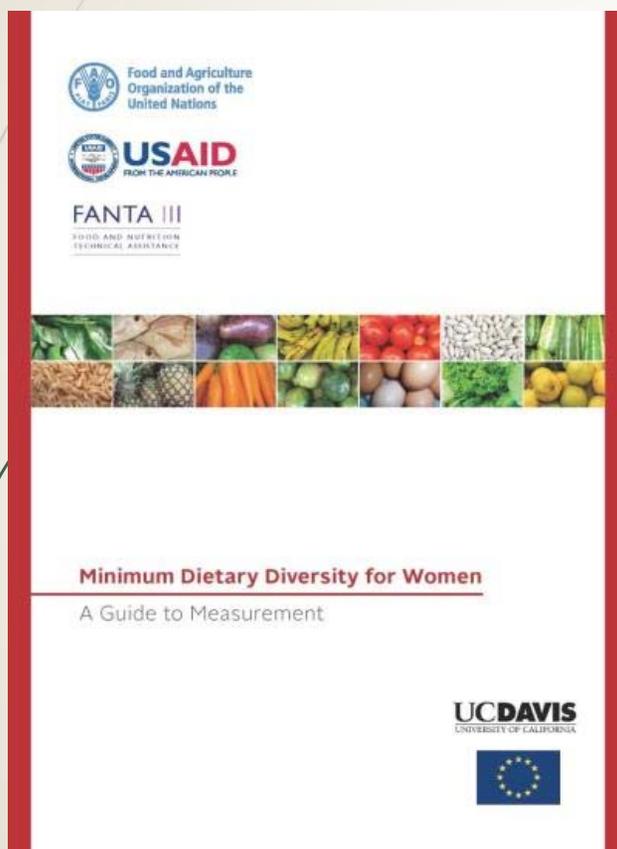
MDD-W is a dichotomous indicator of whether or not women 15–49 years of age⁷ have consumed at least five out of ten defined food groups the previous day or night. The proportion of women 15–49 years of age who reach this minimum in a population can be used as a proxy indicator for higher micronutrient adequacy, one important dimension of diet quality.

The ten food groups are:

1. Grains, white roots and tubers, and plantains
2. Pulses (beans, peas and lentils)
3. Nuts and seeds
4. Dairy
5. Meat, poultry and fish
6. Eggs
7. Dark green leafy vegetables
8. Other vitamin A-rich fruits and vegetables
9. Other vegetables
10. Other fruits

- Improving the proportion of women meeting the MDD-W is an aim of many nutrition-sensitive agriculture programs, and there are efforts to incorporate the MDD-W indicator into global monitoring frameworks.

Guide available at:



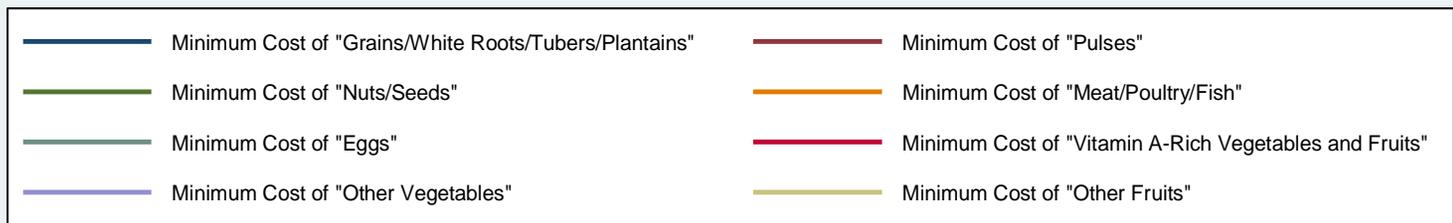
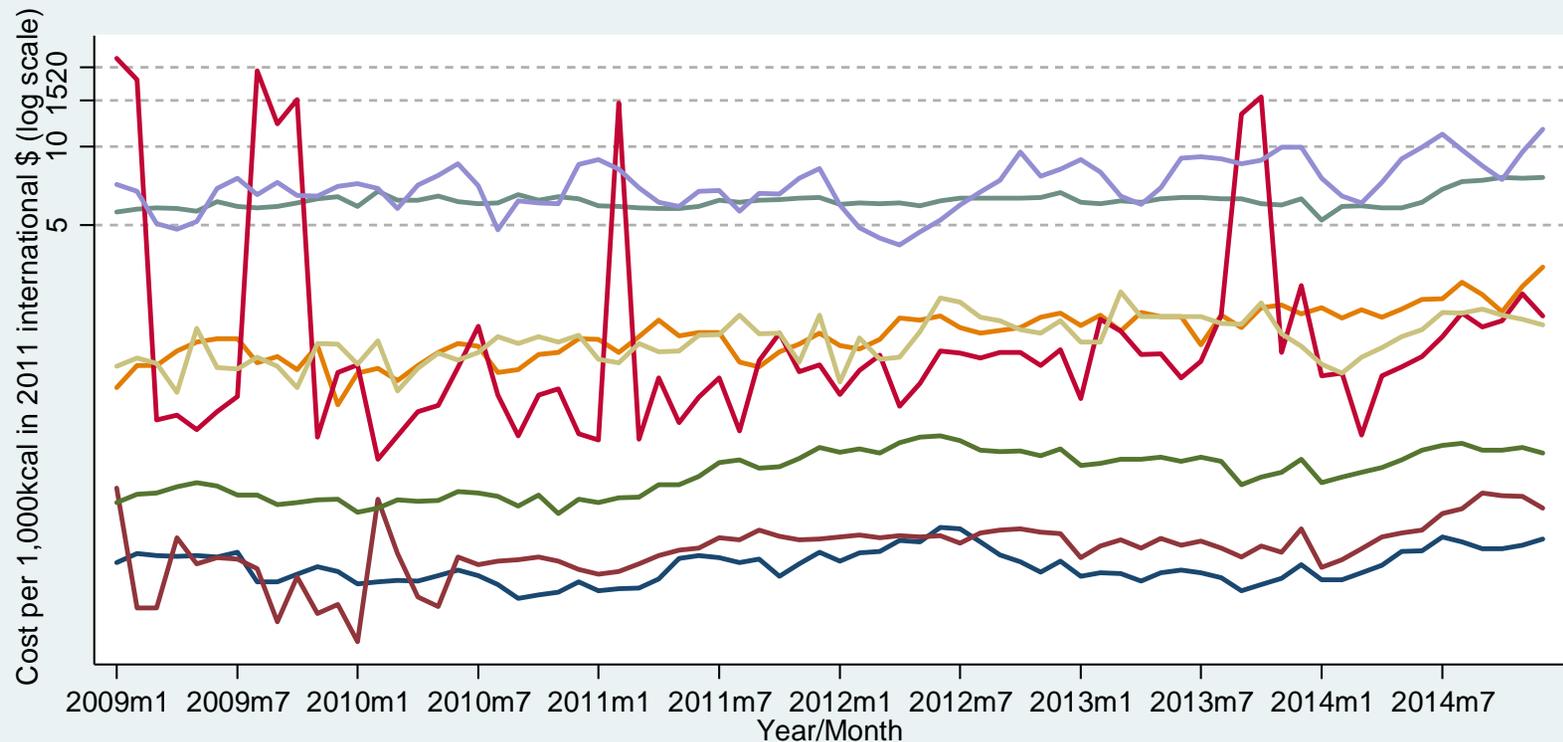
FAO website

<http://www.fao.org/3/a-i5486e.pdf>

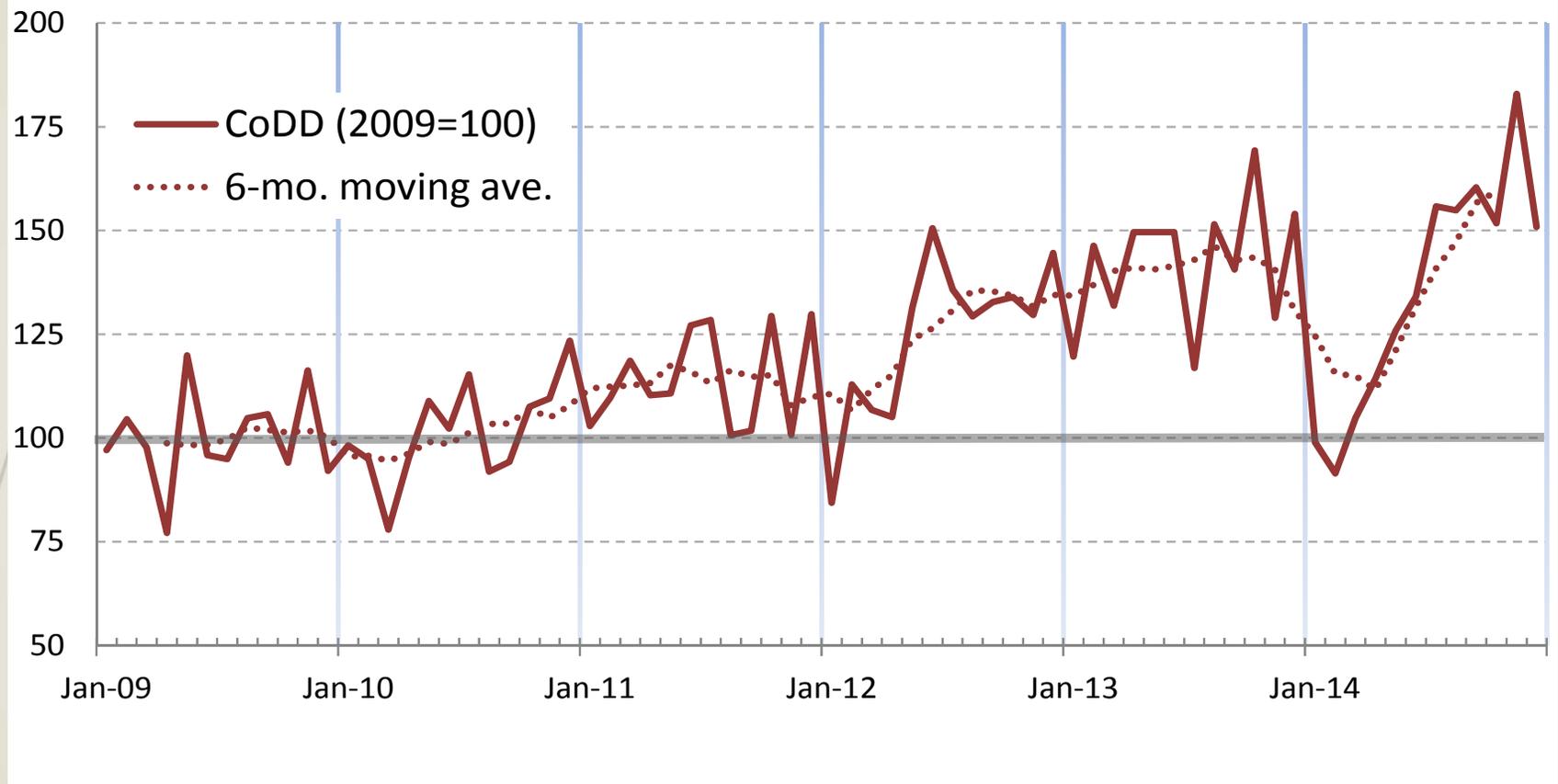
FANTA website

<http://www.fantaproject.org/monitoring-and-evaluation/minimum-dietary-diversity-women-indicator-mddw>

Minimum Costs of Food Groups in Ghana (by kcal)



Ghana CoDD (by kcal)



Q&A and Discussion

Over lunch: Practice worksheets

- **Cost of Recommended Diet (CoRD)**
- **Cost of Diet Diversity index**
- *Cannot do Cost of Nutrient Adequacy (CoNA) by hand because it requires more data and linear programming*
- *NPI can be done with simple calculations but it is a long list of food products), so better to do in Excel.*

Group work

- ▶ In groups: Write down potential uses of these food price data and indicators:
 - ▶ How can the data be used?
 - ▶ What are some questions that can be answered? By which level of data? (national, regional, district, market, etc)
- ▶ Which type of data or indicator is the most resonant? (NPI, CoDD, CoNA, and CoRD; or other)