PHILIPPINE ECONOMIC SOCIETY

44th Annual Meeting

Food Poverty Estimation and Monitoring Surveys: Analyses and Suggestions for Improvement*

by

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Introduction

- Focus on subsistence (i.e. food poverty) incidence. Other measures dependent on this measure, e.g. total poverty incidence.

- Presentation based on national level estimates, in order not to lose sight of key issues and findings.

- Surveys used – FCS, FIES, LFS – have matched samples down to families and conducted in same year (2003).

Next 4 slides introduce FIES and FCS

NSO's 2003 FIES

42,000 sample households

2 visits each covering 6 months

Data capture: Face-to-face interview

Food consumption & expenditure 16 of 70 pages;
- question is average weekly consumption of items,
- quantity consumed, unit price, value consumed
- Outside meals, guests', meal pattern not recorded.

Family composition not obtained; hence taken from 2003 LFS (possible with matched master sample).

FIES food data not used directly in official method.

FNRI's 2003 FCS

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3,300 sample households random subset from LFS/FIES

Data capture method – 1-day food weighing, July-December
- by professional nutritionists
- quantity & cost of every food item consumed
- meals taken outside obtained by same-day recall
- guests' consumption netted out
- quantities saved, thrown out, fed to pets, etc. recorded
- meal pattern recorded, i.e. # of main meals, snacks
- Food not bought included, costs imputed

FCS data not used directly in official food subsistence incidence estimation.

Recommended Energy and Nutrient Intakes (RENI), Philippines 2002 Edition

Population group	Weight kg	Energy kcal	Protein g	Vitamin A µg RE	Vitamin C mg	Thiamin mg	Riboflavin mg	Niacin mg	Folate µg DFE	Calcium mg	Iron mg	Iodine µg
Infants, mo												
Birth - < 6	6	560	9	375	30	0.2	0.3	1.5	65	200	0.38	90
6 - < 12	9	720	14	400	30	0.4	0.4	5	80	400	10	90
Children, y												
1 - 3	13	1070	28	400	30	0.5	0.5	6	160	500	8	90
4 - 6	19	1410	38	400	30	0.6	0.6	7	200	550	9	90
7 - 9	24	1600	43	400	35	0.7	0.7	9	300	700	11	120
Males, y												
10 – 12	34	2140	54	400	45	0.9	1.0	12	400	1000	13	120
13 – 15	50	2800	71	550	65	1.2	1.3	16	400	1000	20	150
16 – 18	58	2840	73	600	75	1.4	1.5	16	400	1000	14	150
19 – 29	59	2490	67	550	75	1.2	1.3	16	400	750	12	150
30 – 49	59	2420	67	550	75	1.2	1.3	16	400	750	12	150
50 – 64	59	2170	67	550	75	1.2	1.3	16	400	750	12	150
65 +	59	1890	67	550	75	1.2	1.3	16	400	800	12	150
Females, y												
10 – 12	35	1920	49	400	45	0.9	0.9	12	400	1000	19	120
13 – 15	49	2250	63	450	65	1.0	1.0	14	400	1000	21	150
16 – 18	50	2050	59	450	70	1.1	1.1	14	400	1000	27	150
19 – 29	51	1860	58	500	70	1.1	1.1	14	400	750	27	150
30 – 49	51	1810	58	500	70	1.1	1.1	14	400	750	27	150
50 – 64	51	1620	58	500	70	1.1	1.1	14	400	800	27	150
65 +	51	1410	58	500	70	1.1	1.1	14	400	800	10	150
Pregnant women												
Trimester												
First			66	800	80	1.4	1.7	18	600	800	27	200
Second		+300	66	800	80	1.4	1.7	18	600	800	34	200
Third		+300	66	800	80	1.4	1.7	18	600	800	38	200
Lactating women												
1st 6 mo		+500	81	900	105	1.5	1.7	17	500	750	27	200
2nd 6 mo		+500	76	900	100	1.5	1.7	17	500	750	30	200

Mean 1-day per capita energy and nutrient intake and percent adequacy, 2003, Philippines

Nutrient	Intake (FCS)	RENI	% Adequacy
Energy (kcal)	1905	1939	98.3
Protein (gr)	56.2	56.6	99.2
Iron (gr)	10.1	16.7	60.1
Retinol (μgr)	455.2	498.0	91.4
Thiamin (mg)	0.88	1.02	86.3
Riboflavin (mg)	0.73	1.07	68.0
Niacin (mg)	20.6	13.2	156.4
Ascorbic acid (mg)	46.5	62.0	75.0

Next 6 slides discuss official method and analyzes performance using FCS data

Official Method for Estimating Food Threshold (Food Poverty Line) and Subsistence Incidence (Food Poverty Incidence)

FT, in pesos, derived from low cost 1-day menu

- menu is prescriptive,
- Menu represents one year consumption? (next 2 slides)
- FTx365 accurate estimate of annual food exp.?

Annual per capita family income dist'n est. (Y) from FIES.

- Family size used as divisor; no scale economy adj.

Family is <u>food poor if its Y < annual FT in province.</u>

- What does this really mean?
- What if FT is computed from FCS or FIES?
- What if Y is adjusted for scale economies of size and need?

Menu for Ifugao

- Breakfast
  - Scrambled Egg
  - Boiled Rice
  - Coffee with milk
- Lunch
  - Boiled Mongo with Malunggay leaves and dried dilis
  - Boiled Rice
  - Banana
- Supper
  - Fried Galunggong
  - Boiled Rice
  - Boiled Kangkong
- Snack
  - Pandesal

Ingredients	A.P. WT. (g)
Saging, latundan	65
Itlog, manok, buo	48
Coffee, instant	1
Gatas, pulbos, filled, instant	5
Asukal, pula	10
Dilis, tuyo	30
Galunggong	54
Munggo, buto, berde, tupo	35
Malunggay, dahon	35
Kangkong	90
Asin, magspang	7
Langis, niyog	15
Bigas, maputi	360
Pandesal	30
Total weight	785

Energy Nutrient	Percent Adequacy
Energy	102
Protein	133
Calcium	151
Iron	88
Vitamin A	132
Thiamin	83
Riboflavin	80
Niacin	244
Vitamin C	119

Source: Consultative Workshop on the Validation of Provincial Menus, 16 June 2006

Menu for Zamboanga del Norte

Breakfast

- Scrambled Egg
- Boiled Rice
- Coffee with milk

Lunch

- Boiled Mongo with Malunggay leaves and dried dilis
- Boiled Rice
- Banana

Supper

- Fried Galunggong
- Boiled Rice
- Boiled Kangkong

Snack

- Boiled saba

Ingredients	A.P. WT. (g)
Saging, latundan	65
Itlog, manok, buo	48
Coffee, instant	1
Gatas, pulbos, filled, instant	5
Asukal, pula	10
Dilis, tuyo	30
Galunggong	54
Munggo, buto, berde, tupo	35
Malunggay, dahon	35
Kangkong	85
Asin, magspang	7
Langis, niyog	15
Bigas, maputi	360
Saging, saba	150
Total weight	900

Energy Nutrient	Percent Adequacy
Energy	102
Protein	129
Calcium	153
Iron	86
Vitamin A	135
Thiamin	81
Riboflavin	80
Niacin	238
Vitamin C	163

Source: Consultative Workshop on the Validation of Provincial Menus, 16 June 2006

2003 Results from Official Method

From Full FIES (n= 42,000); Source: NSCB Website

Annual FT	:	8,149 pesos
Subsistence Incidence	:	10.2% of families
CV	:	2.3%
	:	13.5% of population
CV	:	2.2%

Using FCS (n = 2,754); Source: R. G Arcilla (2006)

Subsistence Incidence	:	9.6% of families
CV	:	6.2%
	:	12.0% of population
CV	:	6.5%

Performance of Official Method Using FCS Data

Per Capita Annual Income (pesos)	Energy Intake Per Capita		Total
	< 2000 kcals	≥ 2000 kcals	
< 8,149 (= FT)	Count = 194 % = 8.5	Count = 45 % = 2.0	Count = 239 % = 10.4
≥ 8,149	Count = 1207 % = 52.8	Count = 842 % = 36.8	Count = 2049 % = 89.6
Total	Count = 1401 % = 61.2	Count = 887 % = 38.8	Count = 2288 % = 100

Notes: 1. 3044-2288 = 756 FCS sample families that had incomplete income data from FIES were excluded.

2. Families incorrectly classified = 54.8%

3. Official method identifies only families with incomes < FT? (10.4%)

4. Families correctly classified as food poor = 8.5%

5. Families correctly classified as not food poor = 36.8%

Same as Previous Table, But With 2000 Kcal Energy and 52.5 gm Protein Thresholds Together

Per Capita Annual Income (pesos)	Energy and Protein Thresholds		Total
	Not meeting 2000 Kcal or 52.5 gm	**Meeting 2000 Kcal and 52.5 gm**	
< 8,149 (= FT)	Count = 210 % = 9.2	Count = 29 % = 1.3	Count = 239 % = 10.4
≥ 8,149	Count = 1301 % = 56.9	Count = 748 % = 32.7	Count = 2049 % = 89.6
Total	Count = 1511 % = 66.1	Count = 777 % = 34.0	Count = 2288 % = 100

Notes: 1. Families incorrectly classified = 58.2%
2. Adding more nutrients to the thresholds which the official method does, will lead to even higher misclassification rates.

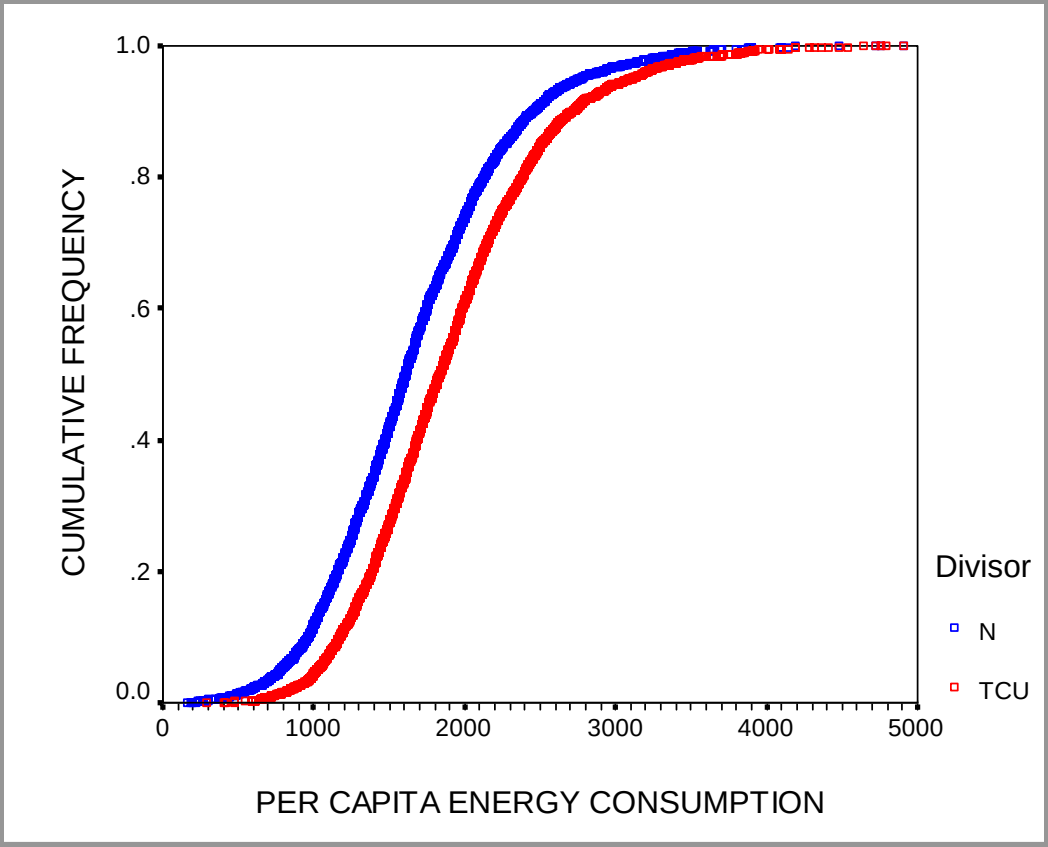
Next 4 slides present alternative approaches, with empirical results

Food Thresholds Based on Average Price per Kilocalorie

	FIES[a]	FCS-ALL[b]	FCS-LOW33[c]
Mean per capita kcal intake	1739	1887	1494
Per capita food expenditure (¢)	2854	3345	1576
Mean daily price per kcal (¢)	1.706	1.763	1.107
Cost of 2000 kcal			
/Daily (PhP)	34.11	35.25	22.13
/Yearly (PhP)	12,453	12,868	8,080

Notes: a. n = 2151 families with pc energy intake within (300-4000)
b. n = 2728 families with pc energy intake within (300-4000)
c. n = 838 lowest 1/3 of families in per capital food expenditure

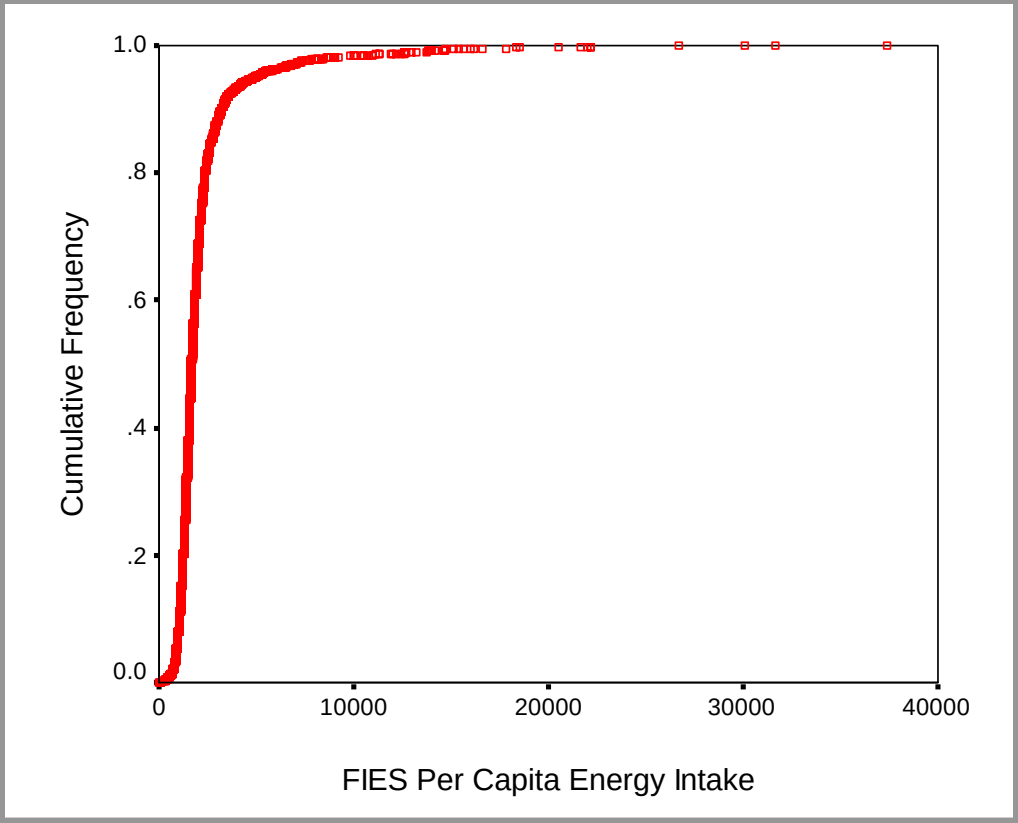
Cumulative distribution of per capita energy consumption (kCal), by divisor



Prevalence (%) of food poverty among families by per capita food poverty threshold (kcal) and by divisor, 2003 FCS (n = 3,044)

PER CAPITA FOOD POVERTY THRESHOLD	DIVISOR	
	N	TCU
2,000	73.8	60.9
1,700	56.9	41.6
1,400	35.3	21.4

Cumulative distribution of FIES per capita energy consumption (kCal)



Prevalence (%) of food poverty among families by per capita food poverty threshold (kcal), 2003 FIES (n = 2,747)

PER CAPITA FOOD POVERTY THRESHOLD	PREVALENCE (%)
2,000	66.8
1,700	51.0
1,400	29.5

Food Poverty Incidence Based on Family RENI Thresholds, 2003 FCS (n = 3,044)

FAMILY FOOD POVERTY THRESHOLD	PREVALENCE (%)	CV (%)
$\sum RENI$	56.0	1.9
$0.85 * \sum RENI$	36.6	2.7
$0.7 * \sum RENI$	17.3	4.5

Next 6 slides are on comparison of FIES and FCS

Regarding FIES Data Capture Method

"During the period specified, did you … consume …(food group, e.g. fruits and vegetables?" If yes, "On average, how much is your weekly consumption of the following?" (list).

- Cheap, hence large sample. However, requires comprehensive listing (16 pages).
- Some responses in pcs (papaya, pandesal, haleya, boiled corn, balut), bundle (kangkong, okra,). What is required is standard units (kg, g, ml) with unit prices. *

Dearth of empirical research on quality of responses from this type of data capture that continues to be used to-date.

Regarding FCS Data Capture Method

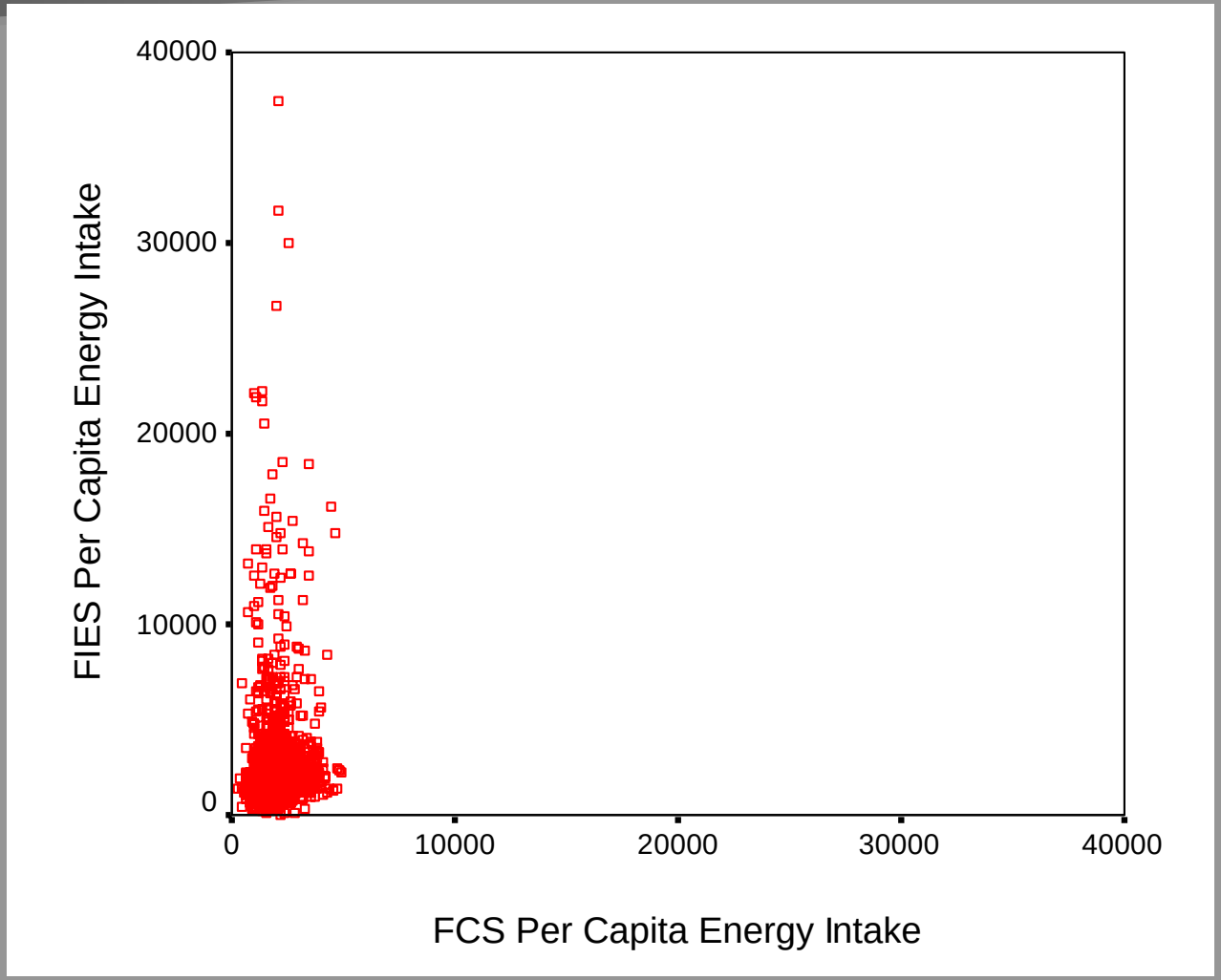
- Food weighing in large survey nearest to gold standard, the latter being measuring intake of individuals in lab.
- Full time nutritionists collect data, vs. temp enumerators.
- Outside meals*, guest consumption, non-human consumption, meal patterns collected and factored in.
- Same day prices, hence accurate.
- Costly, technically demanding, hence small sample.
- 1 day will not capture daily and seasonal variations.**

Interesting Facts from FCS Sample

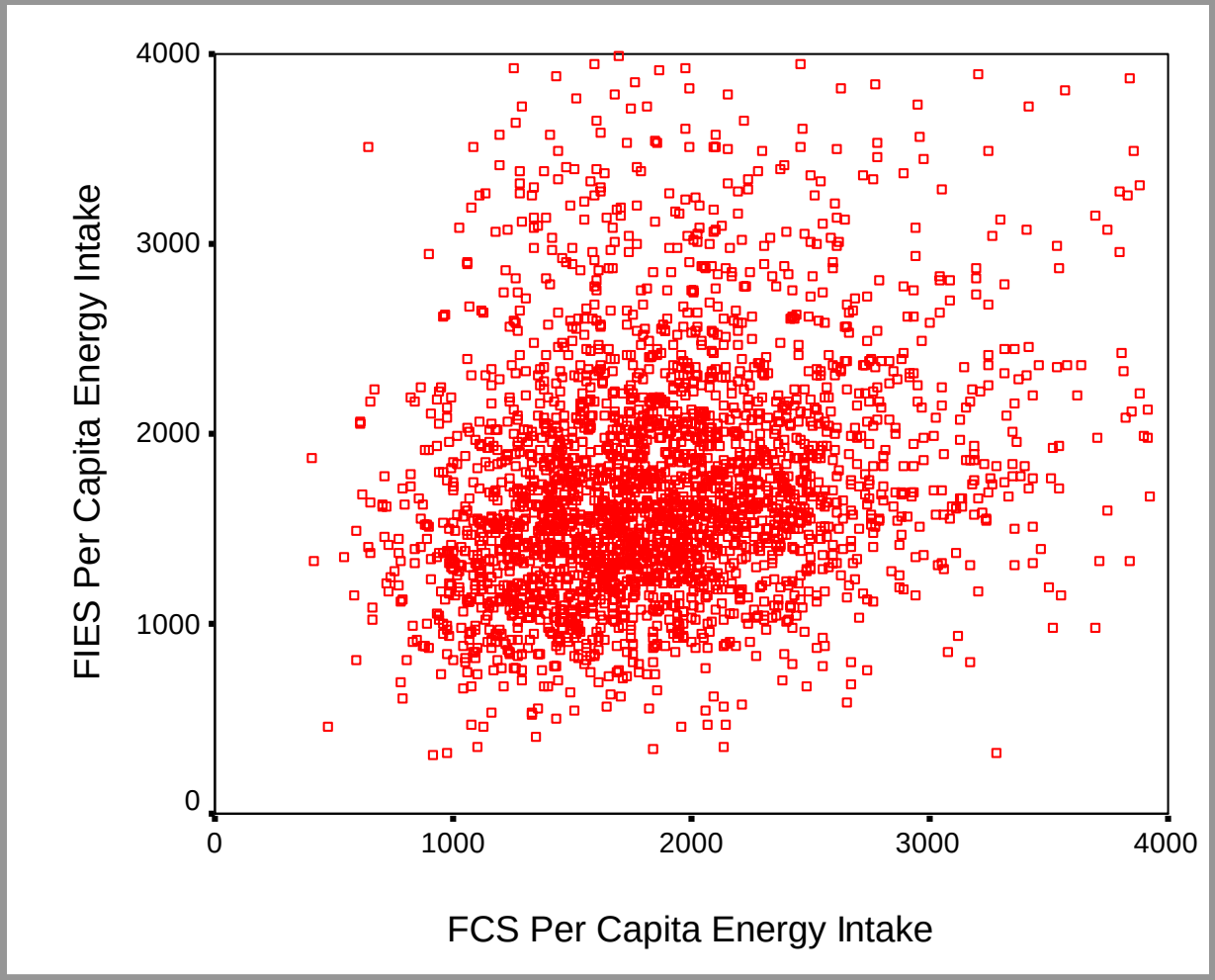
- 44% had member(s) eat away from home.*
- 21% had guest(s) who dined an average of 2 meals.*
- .85% had 2-meal pattern, the rest 3 meal pattern.

Food consumption estimation methods should not ignore these, especially the first two.

Scatter plot of FCS and FIES per capita energy intake – including outliers (n=2747)



Scatter plot of FCS and FIES per capita energy intake – with 300 to <4000 range (n=2541)



Range Checks Using (300, 4000) Kcal

FIES Original:

n=42,094 families

Of which: 3,460 outside range (8%)

FIES Matched:

n= 2747

Of which: 191 outside range (7%)

FCS

n=3,044

Of which: 21 outside range (0.7%)

Key Findings, Recommendations

- Official method does not measure what it claims to measure, because menus fail spectacularly to estimate actual consumption both in nutrients and money terms. Need to give up the menus. Fine tuning, eg. moving to provincial menus, unlikely to help.
- Alternative approaches worth exploring: cost per calorie ; empirical CDF of energy consumption; comparing total family energy consumption versus recommended total energy requirement (RENI).
- FCS data capture method superior to FIES method for collecting commodity level food consumption data, and important components like meals taken outside, meal patterns, etc.
- Harmonize & integrate FIES; e.g. FNRI does food module and NSO concentrate on other expenditure and income. Major methodological research needed here (not budget-neutral); institutional agreements and cooperation crucial to success.

Thank you!