Deriving Nutrition Statistics from Household Consumer Expenditure Surveys: Practices and Beyond

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Background

- To meet the dietary requirements for sustaining a healthy and active life, the choice of food of a person depends on
  - satisfaction of hunger and palatability,
  - cultural traditions
  - purchasing power
- It is important to constantly monitor the nutritional intake of the people especially who are economically deprived.
- Household surveys on consumption and consumer expenditure which collect quantitative information on the entire range of foods consumed by a household provide an opportunity to study various aspects of the nutritional intake of the population covered by the survey.

Background

- The main consumer expenditure surveys of the National Sample Survey Office are conducted quinquennially with the principal objective of obtaining estimates of household **monthly per capita consumer expenditure (MPCE), its distribution over households and persons, and its break-up by commodity group**, at national and State level.
- Also, the schedule of enquiry used for the survey records **quantities of various items of consumption, in particular, of each food item consumed by the household** during the reference period.
- This information on **quantities of food consumed by different households enables the measurement of energy, protein and fat consumed by each surveyed household**, and the estimation of household per capita intake of some nutrients and its distribution over households and persons.

Background

- The tabulation of data on nutritional intake (**restricted to intake of energy, protein and fat**) and its release in the form of a special report on nutrition has become a regular feature of the quinquennial consumer expenditure surveys.
- Last published report- **Report No. 560**: Nutritional Intake in India, 2011-12 for NSS 68th Round (July 2011 – June 2012)
- The survey is
  - aimed at obtaining data on household consumer expenditure and
  - **not specially designed** to serve the needs of a nutrition survey.

Main parameters

- Per capita and per **consumer unit** **calorie, protein and fat intake per day** for different fractile classes of MPCE
- Distribution of households and persons by level of household calorie intake per **consumer unit** per day for different fractile classes of MPCE
- **Percentage break-up of calorie intake over different food groups** and **average intake of calorie, protein and fat per consumer unit per day for households** in different ranges of calorie intake per consumer unit per day
- Percentage break-up of total intake of calorie and protein over different food groups for different fractile classes of MPCE
- Break-up of **average number of meals consumed per month per household by source of meals**, for each fractile class of MPCE, and break-up of average number of meals consumed per month per person by source, for different age groups and sexes

Data requirement

- **Nutrition is an individual issue.**
- **The data requirement is on**
  - **Age**
  - **Gender**
  - **Region**
  - **Socio-economic factors**
  - **Physical activity**
  - **Purchasing power**
  - **Individual consumption of food,**
  - **Status of health, etc.**

- **In NSS HCE survey data collected on**
  - **Household consumption of food**
  - **Household socio-economic factors**
  - **Some individual character-istics like age, gender, etc.**

Consumer Unit

- **Consumer unit** is a unit used as an indicator of the energy requirement of a group of persons of different sexes and ages.
- Taking the calorie requirement of **an average male in the age group 20-39 doing sedentary work as the norm**, the average calorie requirements of males and females of other age groups are expressed as a ratio to this norm.
- Ex: a household consisting of two men aged 35 and 65 has 1.8 consumer units while a household with one woman aged 28 and a child aged 3 has only 1.25 consumer units- **how?**.

Consumer Unit

sex	no. of consumer units assigned to a person											
	age in completed years											
	<1	1-3	4-6	7-9	10-12	13-15	16-19	20-39	40-49	50-59	60-69	70+
male	0.43	0.54	0.72	0.87	1.03	0.97	1.02	**1.00**	0.95	0.90	0.80	0.70
female	0.43	0.54	0.72	0.87	0.93	0.80	0.75	0.71	0.68	0.64	0.51	0.50

- **The recommended calorie intake level for Indians set by the National Institute of Nutrition, ICMR, is profiled on age, sex, body mass and nature of work. The norm set for the reference Indian man of age 18-29 years with a normal body mass index and body weight 60 kg doing sedentary work is 2320 Kcal per day.**
- **The norms used by the Planning Commission (ref: *Eleventh Five-Year Plan, 2007-12, Vol.II, Social Sector*) are 2400 Kcal per person per day for the rural sector and 2100 Kcal per person per day for the urban sector.**

Measurement of nutrient intake

- Determination of calorie requirement of a person in terms of age and/or sex is a simplification of the real situation, since the role of various other factors such as body weight, height, nature of work, state of health is ignored.
- Nutritionists, often differ in their approaches to the problem, some specifying calorie requirement as function of body weight, while others assign requirements depending on nature of work (sedentary/ moderate/ heavy).
- From the 26th round, NSS tables on nutritional intake have expressed observed calorie intakes per consumer unit of different segments of population as percentages of a level of 2700 kilocalories per consumer unit per day. This practice is continued till date.

Calculation of household intake of energy, protein and fat

- The quantities of food recorded as consumed by the household are converted into the equivalent amounts of energy, protein and fat on the basis of a Nutrition Chart largely based on an ICMR publication which gives the energy, protein and fat content per unit of different foods in the Indian diet.
- It does not consider the fact that the actual intake of nutrients depends on how these foods are actually processed and/or cooked in the surveyed households.
- **How this conversion is made for each item of food consumption?**

Types of foods & Meals

- Home-processed food
- Fruits and vegetables, which can be consumed directly
- Cooked meals purchased / Served processed food received in workplace / Served processed food received as assistance
- Other Served processed food and packaged processed food items
- Other processed food like bread, etc.

Home-processed food-ingredients – broad groups

	cereals
	cereal substitute
	pulses & products
	milk & milk products
	salt & sugar
	edible oil
	egg, fish & meat
	vegetables
	fruits (fresh)
	fruits (dry)
	spices
	beverages
	served processed food
	packaged processed food
	pan
	intoxicants

Home-processed food-ingredients

item	code	consumption out of home produce		total consumption		source code
		quantity @ (0.000)	value (Rs.)	quantity@ (0.000)	value (Rs.)	
(1)	(2)	(3)	(4)	(5)	(6)	(7)
rice – PDS	101					1
rice – other sources	102					
chira	103					
khoi, lawa	104					
muri	105					*
other rice products	106					*

***Source code**: only purchase –1, only home-grown stock –2, both purchase and home-grown stock –3, only free collection –4, only exchange of goods and services –5, only gifts / charities – 6, others –9*

Nutrition Chart

- Nutrient contents of different items are largely based on “Nutritive Values of Indian Foods” by C. Gopalan, B.V. Ramasastry and S.C. Balasubramanian, revised and updated by B.S. Narasinga, Y.G. Deosthale and K.C. Pant, 1991.
- Generally, the total intake of calorie, protein and fat from an item is derived from the quantities reported as consumed by the sample households.
- The nutrient contents of each item per unit of quantity (as collected through the schedule) are short-listed and used for conversion

For example

Item code	item	unit	calories per unit (kcal)	protein per unit (gm)	fat per unit (gm)
(1)	(2)	(3)	(4)	(5)	(6)
101	rice – PDS	kg	3460	75	5
102	rice – other sources	kg	3460	75	5
103	chira	kg	3460	66	12
104	khoi, lawa	kg	3250	75	1
105	muri	kg	3250	75	1
106	other rice products	kg	3460	75	5

Fruits and vegetables, which can be consumed directly

item	code	consumption out of home produce		total consumption	
		quantity @ (0.000)	value (Rs.)	quantity @ (0.000)	value (Rs.)
(1)	(2)	(3)	(4)	(5)	(6)
banana (no.)	220				
jackfruit	221				
watermelon	222				
pineapple (no.)	223				
coconut (no.)	224				
green coconut (no.)	225				

Fruits and vegetables, which can be consumed directly

item	unit	calories per unit (kcal)	protein per unit (gm)	fat per unit (gm)
banana	no.	116	1.2	0.3
jackfruit	kg	880	19	1
watermelon	kg	160	2	2
pineapple	no.	460	4	1
coconut	no.	660	6.7	62.4
coconut: green	no.	60	3.5	0.25

Cooked meals purchased/ Served processed food received in workplace / Served processed food received as assistance

item	unit	calories per unit (kcal)	protein per unit (gm)	fat per unit (gm)
cooked meals received as assistance	no.	1200	25	20
cooked meals received free in workplace	no.	1200	25	20
cooked snacks purchased [samosa, puri, paratha, burger, chowmein, idli, dosa, vada, chops, pakoras, pao bhaji, etc.] (rural)	Re	26.6	0.7	1.05
cooked snacks purchased [samosa, puri, paratha, burger, chowmein, idli, dosa, vada, chops, pakoras, pao bhaji, etc.] (urban)	Re	24.7	0.7	0.95
other served processed food (rural)	Re	26.6	0.7	1.05
other served processed food (urban)	Re	24.7	0.7	0.95

* As suggested by different expert groups from time to time

Accounting of meals served to non-household members

- “Consumption” of food items by a household, as recorded by the survey, includes not only the actual consumption by the members of the household but also the consumption of meals prepared in the household and served to non-members during the reference period.
- Because of a practical difficulty of estimating the quantities and values of individual items used for preparing the meals served to employees or others, number and value of meals prepared in the household kitchen and provided to guests, employees or others are, to simplify field work, recorded in the domestic consumption of the household *serving* the meals.
- Cooked meals received as perquisites from employer household or as gift or charity are not recorded in the recipient household.

Accounting of meals served to non-household members

- As a general principle, cooked meals purchased from the market for consumption of the members and for guests are also recorded in the purchaser household.

- This procedure of recording cooked meals served to others in the expenditure of only the serving households leads to bias-free estimates of per capita and total consumer expenditure, and also of per capita or per consumer intake of nutrients for the population as a whole.
- However, donors of free cooked meals are likely to be concentrated at the upper end of the per capita expenditure range and the corresponding recipients at the lower end of the same scale. Consequently, the derived nutrition intakes may get **inflated for the net donors and understated for the net recipients.**
- This point has to be kept in mind while interpreting the NSS consumer expenditure data for any studies relating to the nutritional status of households.

Reference period

- The consumption of any good or service by a household or person occurs in the form of a flow over time.
- A survey may need to record the volume of consumption over a short period such as a day, or a long period such as a year. The time period for which consumption is recorded is called the reference period.
- It may vary from item to item. Because the respondents are asked to recall and report the volume of consumption, the reference period is also called the recall period.

Reference period

Item group	Reference period	
	Sch. Type 1	Sch. Type 2
Food: (Cereals, pulse, milk & milk products, sugar & salt)	30 days	30 days
Other Food, pan, etc:	30 days	7 days

- **Too long a reference period invites recall bias of the respondents**
- **Too short a reference period yields wrong estimates for items which are not regular in nature**

Thank you