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**Working Paper**

## Food Accounting for Statistically Underdeveloped Countries: Lecture Illustrations

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FOOD ACCOUNTING  
FOR  
STATISTICALLY UNDERDEVELOPED COUNTRIES  
-----  
LECTURE ILLUSTRATIONS

By

Thomas T. Poleman

February 1977

No. 77-5

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DEPARTMENT OF  
AGRICULTURAL ECONOMICS  
WARREN HALL

10 February 1977

The materials presented here are intended to illustrate a lecture on food accounting techniques appropriate to less-developed countries. They are drawn from many sources, but as most are either the work of me or my students, they mirror the evolution of our thinking.

The food balance sheet is introduced first. Still the basic tool of the food economist, it remains in the LDCs depressingly susceptible to the pitfalls of "garbage in, garbage out." But there are ways to filter the garbage.

Comparatively giant strides have been made with the household budget survey. Once carried out primarily to provide weights for urban living cost indices, a few in recent years have had the whole spectrum of food behavior as their purview. One such was the 1969/70 Socio-Economic Survey of Ceylon, which yielded a wealth of information. More are urgently needed. With a salute to the former Director of Statistics of Ceylon, the excellent L. N. Perera, we reproduce a minified version of the questionnaire.

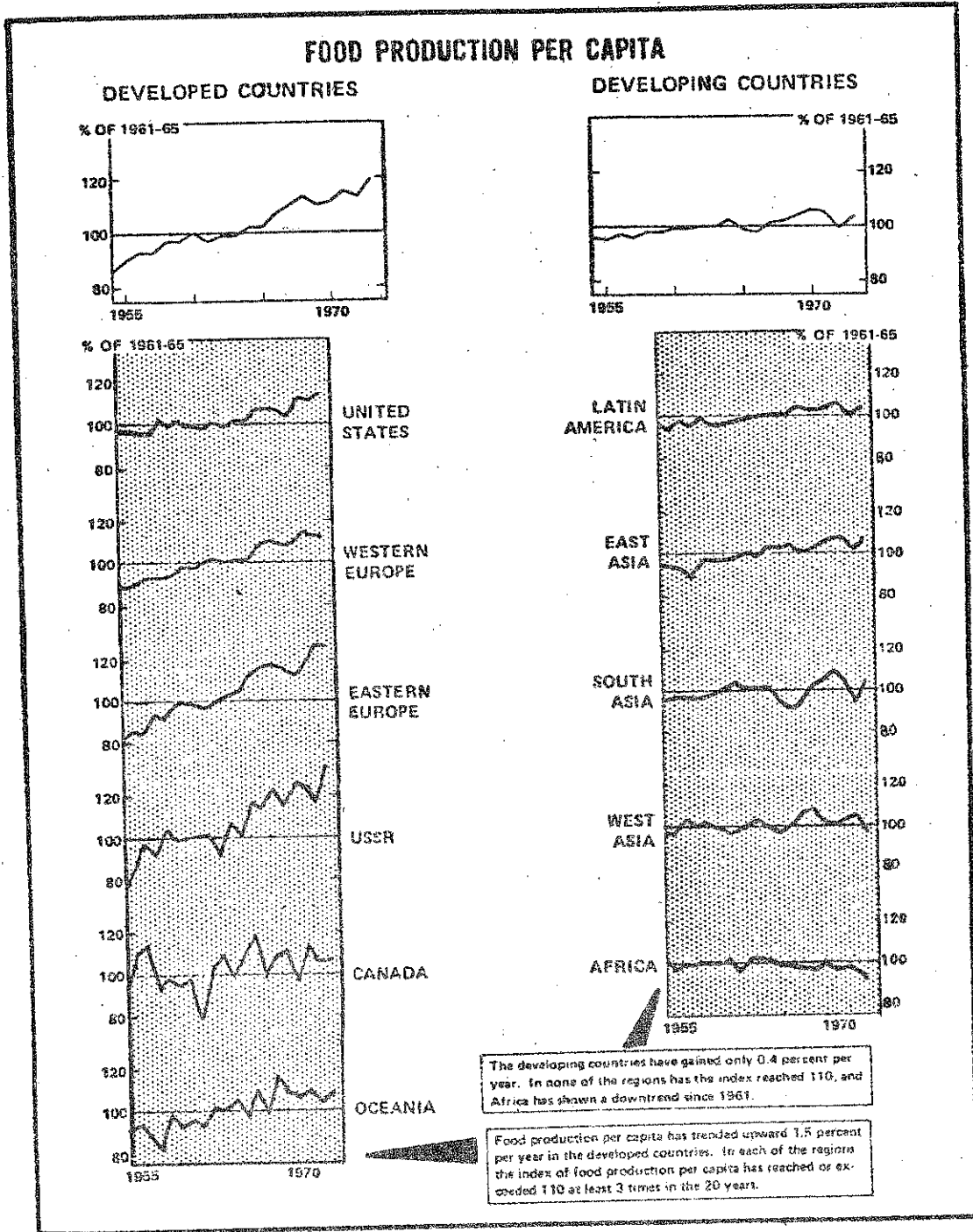
Despite its many attractions, our third tool, the road-check survey, remains little used in the LDCs. Politics, I suppose. The truck one wants to stop is increasingly likely to be carrying contraband.

Still there are grounds for optimism. The desirability of food planning is widely preached and gaining acceptance. An essential precondition is trustworthy quantification.



Thomas T. Poleman

CHART 1\*



\* Reproduced from USDA, ERS, The World Food Situation and Prospects to 1985 (December 1975), p. 15.

USDA series for Africa per capita food production (Chart 1) based on:

1. Maize in South Africa
2. Wheat in Morocco and Tunisia
3. Cotton in Egypt, Sudan, and Tunisia
4. Cocoa in Ghana, Nigeria, and Ivory Coast
5. Coffee in a number of countries.

TABLE 1. NUMBER OF PEOPLE ESTIMATED BY THE FAO TO HAVE HAD AN INSUFFICIENT PROTEIN-ENERGY SUPPLY IN 1970, BY REGION\*

| Region        | Popula-<br>tion<br>(millions) | Percent-<br>age<br>below<br>lower<br>limit | Number<br>below<br>lower<br>limit<br>(millions) |
|---------------|-------------------------------|--|---|
| Developed     | 1074                          | 3  | 28  |
| Developing*   | 1751                          | 25   | 434   |
| Latin America | 283                           | 13   | 36  |
| Far East*     | 1020                          | 30   | 301   |
| Near East     | 171                           | 18   | 30  |
| Africa        | 273                           | 25   | 67  |
| World*        | 2825                          | 16   | 462   |

\* excluding Asian centrally planned economies.

\* Data from UN, World Food Conference, "Assessment of the World Food Situation--Present and Future" (Rome, 5-16 November 1974), p. 66.

TABLE 2. FAO ESTIMATES OF AVERAGE ENERGY AND PROTEIN SUPPLY, 1961 AND 1969-71, BY REGION\*

|                                      | Energy           |                    | Protein          |                    | Energy as Percent<br>of Requirement |                    |
|--------------------------------------|------------------|--------------------|------------------|--------------------|-------------------------------------|--------------------|
|                                      | 1961             | 1969-71<br>Average | 1961             | 1969-71<br>Average | 1961                                | 1969-71<br>Average |
|                                      | (kcal per caput) |                    | (grms per caput) |                    | (percent)                           |                    |
| Developed market economies           | 2950             | 3090               | 87.5             | 95.1               | 115                                 | 121                |
| Western Europe                       | 3020             | 3130               | 89.3             | 93.7               | 118                                 | 123                |
| North America                        | 3110             | 3320               | 92.3             | 105.2              | 118                                 | 126                |
| Oceania                              | 3210             | 3260               | 92.7             | 108.1              | 121                                 | 123                |
| Other developed market<br>economies  | 2420             | 2550               | 73.3             | 79.1               | 102                                 | 108                |
| Eastern Europe and U.S.S.R.          | 2990             | 3260               | 85.8             | 99.3               | 116                                 | 127                |
| TOTAL Developed Countries            | 2960             | 3150               | 87.0             | 96.4               | 116                                 | 123                |
| Developing market economies          | 2130             | 2210               | 55.0             | 56.0               | 93                                  | 97                 |
| Africa                               | 2120             | 2190               | 55.7             | 58.4               | 91                                  | 94                 |
| Far East                             | 2050             | 2080               | 51.3             | 50.7               | 92                                  | 94                 |
| Latin America                        | 2410             | 2530               | 63.7             | 65.0               | 100                                 | 105                |
| Near East                            | 2200             | 2500               | 62.3             | 69.3               | 89                                  | 102                |
| Asian centrally planned<br>economies | 2020             | 2170               | 54.7             | 60.4               | 86                                  | 92                 |
| TOTAL Developing Countries           | 2100             | 2200               | 54.9             | 57.4               | 91                                  | 95                 |
| WORLD                                | 2380             | 2480               | 65.2             | 69.0               | 100                                 | 104                |

\* Reproduced from UN, World Food Conference, "Assessment of the World Food Situation--Present and Future" (Rome, 5-16 November 1974), p. 58.

The figures relate to protein and energy content of the food available at the retail level after allowance for the storage and marketing losses and waste.

NATIONAL FOOD ACCOUNTING

| <u>Objectives</u>                           | <u>Data Sources</u>             |
|---|---------------------------------|
| To quantify present average situation ----- | Food balance sheet              |
| Breakdown by:                               |                                 |
| Income -----                                | Household budget survey         |
| Locality -----                              | Nutrition survey                |
| Season of year -----                        |                                 |
| Place in family -----                       |                                 |
| To quantify likely future situation -----   | Road check-cum-marketing survey |

Food Balance Sheet

Prod. + trade + stocks = seed + feed + waste + nonfood + processing + human consump.

"Famine equation":  $\frac{AHC}{365 \times \text{population}} - 15\% \leq$  "requirements"

Limitations

1. homogeneity assumption
2. data availability

Conclusion: a useful tool, but handle with care. Compare with other evidence.

Household Budget Survey

Most useful data source (but remember purpose for which it was conducted)

Usual coverage:

1. 1 week - 1 month
2. small number of households; extrapolation problems
3. urban-rural breakdown
4. ethnic breakdown
5. varying income ranges; often difficult to relate to total population
6. expenditures, not quantities for foodstuffs

Nutrition Surveys

1. Only source for individual food intake
2. Very expensive, very inefficient in use of manpower
3. Tiny samples or misleading results, "Hunger in America"

Road Check-cum-Marketing Surveys

1. Long time coverage--usually 12 months
2. Stop all or % of vehicles at convenient spot
3. Develop common load denominators
4. Variations: markets as to focus

Cost Comparison

|   |  |
|---|--|
| FBS - one man, one country                        | Road check - Uganda: \$10,000                                    |
| HBS - Ceylon: 250 surveyors,<br>10,000 households | Nutrition Survey - INCAP: \$300,000; 34<br>men; 2,000 households |



TABLE 4. Ceylon: Food balance sheet, average 1955-60\*  
(Average population — 9,303,000)

| Commodity               | Production | Gross exports | Gross imports | Available supply     | Seed & feed† | Waste‡ | Non-food manufacture | Gross food supply | Extraction rate | Net food supply  | Per capita supply per day |            |                   |
|-------------------------|------------|---------------|---------------|----------------------|--------------|--------|----------------------|-------------------|-----------------|------------------|---------------------------|------------|-------------------|
|                         |            |               |               |                      |              |        |                      |                   |                 |                  | Grams                     | Calories** | Protein** (grams) |
|                         |            |               |               | thousand metric tons |              |        |                      |                   | percent§        | 1000 metric tons |                           |            |                   |
| <b>Cereals</b>          |            |               |               |                      |              |        |                      |                   |                 |                  |                           |            |                   |
| Rice                    | 731.9      |               | 712.5         | 1,444.4              | 59.4         | 30.3   | —                    | 1,254.7           | 68-72           | 943.3            | 277.7                     | 1,000.0    | 18.90             |
| Wheat flour             | —          |               | 206.5         | 206.5                | —            | —      | —                    | 206.5             | —               | 206.5            | 60.8                      | 223.0      | 6.00              |
| Maize                   | 7.5        |               | —             | 7.5                  | 0.5          | —      | —                    | 7.0               | 90              | 6.3              | 2.0                       | 7.0        | 0.02              |
| Kurrahan                | 17.6       |               | —             | 17.6                 | 0.5          | —      | —                    | 17.1              | 90              | 15.4             | 5.0                       | 17.0       | 0.35              |
| Sorghum                 | 0.8        |               | —             | 0.8                  | 0.025        | —      | —                    | 0.8               | 90              | 0.8              | 0.3                       | 3.0        | 0.03              |
| <b>Total</b>            |            |               |               |                      |              |        |                      |                   |                 |                  |                           | 1,250.0    | 25.30             |
| <b>Roots and tubers</b> |            |               |               |                      |              |        |                      |                   |                 |                  |                           |            |                   |
| Manioc                  | 196.5      |               | —             | 196.5                | —            | 19.6   | —                    | 176.9             | —               | 176.9            | 52.1                      | 57.0       | 0.5               |
| Sweet potatoes          | 38.9       |               | —             | 38.9                 | —            | 3.8    | —                    | 35.0              | —               | 35.0             | 10.4                      | 10.0       | 0.1               |
| Potatoes                | 0.5        |               | 36.0          | 36.5                 | —            | 3.6    | —                    | 33.0              | —               | 33.0             | 9.6                       | 7.0        | —                 |
| <b>Total</b>            |            |               |               |                      |              |        |                      |                   |                 |                  |                           | 74.0       | 0.6               |
| <b>Sugar</b>            |            |               |               |                      |              |        |                      |                   |                 |                  |                           |            |                   |
| Refined                 | —          |               | 144.2         | 144.2                | —            | —      | —                    | 144.2             | —               | 144.2            | 42.5                      | 164.0      | —                 |
| Not refined             | —          |               | 20.8          | 20.8                 | —            | —      | —                    | 20.8              | —               | 20.8             | 6.0                       | 21.0       | —                 |
| Jaggery                 | —          |               | 4.2           | 4.2                  | —            | —      | —                    | 4.2               | —               | 4.2              | 1.4                       | 5.0        | —                 |
| <b>Total</b>            |            |               |               |                      |              |        |                      |                   |                 |                  |                           | 190.0      | —                 |
| <b>Pulses</b>           |            |               |               |                      |              |        |                      |                   |                 |                  |                           |            |                   |
| Dhall                   | —          |               | 9.2           | 9.2                  | —            | —      | —                    | 9.2               | —               | 9.2              | 2.7                       | —          | —                 |
| Green gram              | 3.6        |               | 9.4           | 13.0                 | 0.22         | —      | —                    | 12.8              | —               | 12.8             | 3.8                       | —          | —                 |
| Black gram              | —          |               | 4.2           | 4.2                  | —            | —      | —                    | 4.2               | —               | 4.2              | 1.4                       | —          | —                 |
| Chick peas              | —          |               | 4.9           | 4.9                  | —            | —      | —                    | 4.9               | —               | 4.9              | 1.4                       | 58.0       | 12.7              |
| Lentils                 | —          |               | 16.6          | 16.6                 | —            | —      | —                    | 16.6              | —               | 16.6             | 5.0                       | —          | —                 |
| Other                   | 2.5        |               | 5.8           | 8.3                  | 0.13         | —      | —                    | 8.1               | —               | 8.1              | 2.5                       | —          | —                 |
| <b>Total</b>            |            |               |               |                      |              |        |                      |                   |                 |                  |                           | 58.0       | 12.7              |
| <b>Vegetables</b>       | 475.0      |               | —             | 475.0                | —            | 25.0   | —                    | 450.0             | —               | 450.0            | 125.2                     | 28.0       | 1.7               |

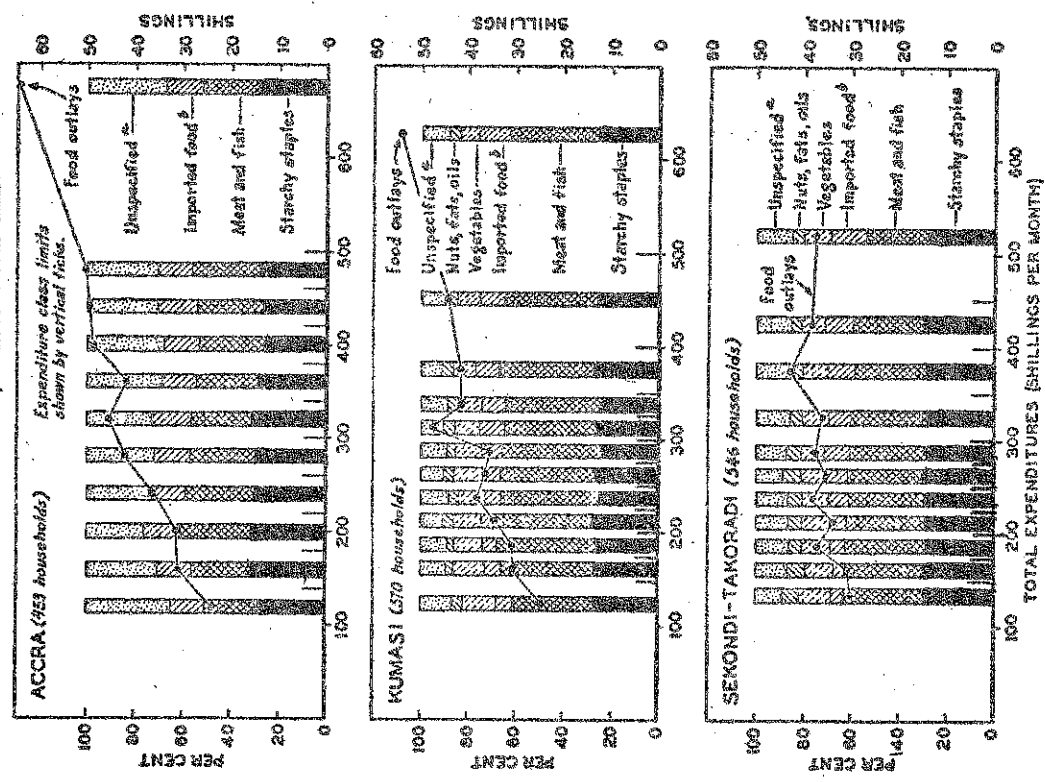
| Commodity              | Production | Gross exports | Gross imports | Available supply     | Seed & feed† | Waste‡ | Non-food manufacture | Gross food supply | Extraction rate | Net food supply  | Per capita supply per day |            |                   |
|------------------------|------------|---------------|---------------|----------------------|--------------|--------|----------------------|-------------------|-----------------|------------------|---------------------------|------------|-------------------|
|                        |            |               |               |                      |              |        |                      |                   |                 |                  | Grams                     | Calories** | Protein** (grams) |
|                        |            |               |               | thousand metric tons |              |        |                      |                   | percent§        | 1000 metric tons |                           |            |                   |
| <b>Fruits</b>          | 55.0       |               | —             | 55.0                 | —            | 5.0    | —                    | 50.0              | —               | 50.0             | 14.8                      | 9          | 0.06              |
| <b>Meat</b>            |            |               |               |                      |              |        |                      |                   |                 |                  |                           |            |                   |
| Beef                   | 12.9       |               | —             | 12.9                 | —            | —      | —                    | 12.9              | —               | 12.9             | 3.8                       | 5.0        | 0.60              |
| Buffalo                | 0.9        |               | —             | 0.9                  | —            | —      | —                    | 0.9               | —               | 0.9              | 0.3                       | 0.2        | 0.04              |
| Mutton                 | 1.3        |               | —             | 1.3                  | —            | —      | —                    | 1.3               | —               | 1.3              | 0.3                       | 0.4        | 0.04              |
| Pork                   | 1.1        |               | —             | 1.1                  | —            | —      | —                    | 1.1               | —               | 1.1              | 0.3                       | 0.9        | 0.04              |
| Poultry                | 0.1        |               | —             | 0.1                  | —            | —      | —                    | 0.1               | —               | 0.1              | 0.3                       | 0.4        | 0.04              |
| Canned meat            | —          |               | —             | —                    | —            | —      | —                    | —                 | —               | 0.1              | —                         | —          | —                 |
| <b>Total</b>           |            |               |               |                      |              |        |                      |                   |                 |                  |                           | 7.9        | .76               |
| <b>Eggs</b>            | 7.5        |               | 1.4           | 8.8                  | —            | —      | —                    | 8.8               | —               | 8.8              | 2.5                       | 4.0        | 0.3               |
| <b>Fish</b>            |            |               |               |                      |              |        |                      |                   |                 |                  |                           |            |                   |
| Fresh                  | 42.8       |               | —             | 42.8                 | —            | 10.7   | 17.3††               | 15.0              | —               | 15.0             | 4.4                       | 6.0        | 0.8               |
| Dried                  | 5.9        |               | 38.8          | 44.7                 | —            | —      | —                    | 44.7              | —               | 44.7             | 13.2                      | 40.0       | 6.0               |
| Tinned                 | —          |               | 4.0           | 4.0                  | —            | —      | —                    | 4.0               | —               | 4.0              | 1.4                       | 4.0        | 0.3               |
| <b>Total</b>           |            |               |               |                      |              |        |                      |                   |                 |                  |                           | 58.0       | 7.1               |
| <b>Milk</b>            |            |               |               |                      |              |        |                      |                   |                 |                  |                           |            |                   |
| Cow                    | 57.1       |               | —             | 57.1                 | —            | —      | —                    | 57.1              | —               | 57.1             | 14.0                      | 9.0        | .5                |
| Buffalo                | 15.2       |               | —             | 15.2                 | —            | —      | —                    | 15.2              | —               | 15.2             | 4.4                       | 4.5        | .2                |
| Milk foods             | —          |               | 1.6           | 1.6                  | —            | —      | —                    | 1.6               | —               | 1.6              | .6                        | —          | —                 |
| <b>Total</b>           |            |               |               |                      |              |        |                      |                   |                 |                  |                           | 13.5       | .7                |
| <b>Oils &amp; fats</b> |            |               |               |                      |              |        |                      |                   |                 |                  |                           |            |                   |
| Coconut                | 2,300.5    | 6.7           | —             | 2,293.8              | —            | —      | 2,213.8††            | 80.0              | —               | 80.0             | 24.0                      | 42.0       | .5                |
| Coconut oil            | 1,100.0    | 750.0         | —             | 325.0                | —            | —      | —                    | 325.0             | —               | 325.0            | 37.0                      | 320.0      | —                 |
| Butter                 | —          |               | 0.1           | —                    | —            | —      | —                    | 0.1               | —               | 0.1              | —                         | 0.2        | —                 |
| <b>Total</b>           |            |               |               |                      |              |        |                      |                   |                 |                  |                           | 362.2      | .5                |
| <b>TOTAL</b>           |            |               |               |                      |              |        |                      |                   |                 |                  |                           | 2,046.6    | 49.7              |

\* Reproduced from Thambapillai Jogaratnam and T. T. Poleman, Food in the Economy of Ceylon (Cornell Intl. Agric. Dev. Bull. 11, Oct. 1969), pp. 9-10.



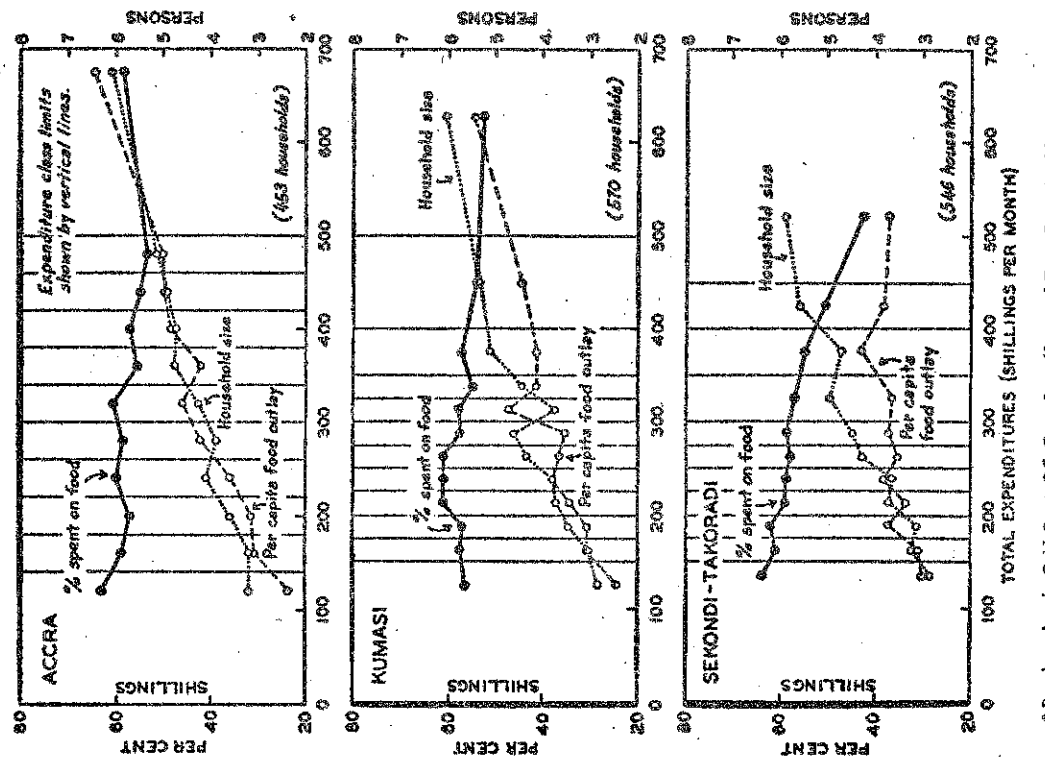
CHART 2. TYPICAL BUDGET SURVEY FINDINGS ON FOOD EXPENDITURE BEHAVIOR\*

GHANA, URBAN HOUSEHOLD BUDGET SURVEY SAMPLES, 1953 AND 1955:  
PERCENTAGE BREAKDOWN OF FOOD EXPENDITURES, AND THE PER CAPITA  
MONTHLY FOOD OUTLAYS, BY EXPENDITURE CLASS<sup>a</sup>



\* Based on data in Gold Coast, Off. Govt. Stat. (Stat. and Econ. Papers), 1953 *Accra Survey of Household Budgets* (No. 2, December 1953), pp. 10-14; *Kumasi Survey of Population and Household Budgets, 1955* (No. 5, March 1956), pp. 36-37; *Sekondi-Takoradi Survey of Population and Household Budgets, 1955* (No. 4, March 1956), pp. 32-33. Positioning of data for extreme expenditure classes reflects actual average expenditures; for other classes the midpoint. Figures do not include expenditures on drink.  
<sup>a</sup> A residual figure. In addition to such truly unspecified items as snacks purchased away from home, it includes expenditures for the less important starchy staples, meat and fish items, vegetables, and nuts, fats, and oils. (For Accra, of course, it includes all outlays for items in the latter two groupings.) It is best thought of as being prepared among the major commodity groups.  
<sup>b</sup> Packaged imported items. It includes such things as sugar and canned meat and milk, but not wheat flour and the like.

GHANA, URBAN HOUSEHOLD BUDGET SURVEY SAMPLES, 1953 AND 1955:  
PERCENTAGE OF TOTAL DOMESTIC EXPENDITURES SPENT ON FOOD, PER CAPITA  
MONTHLY FOOD OUTLAYS, AND HOUSEHOLD SIZE, BY EXPENDITURE CLASS<sup>a</sup>

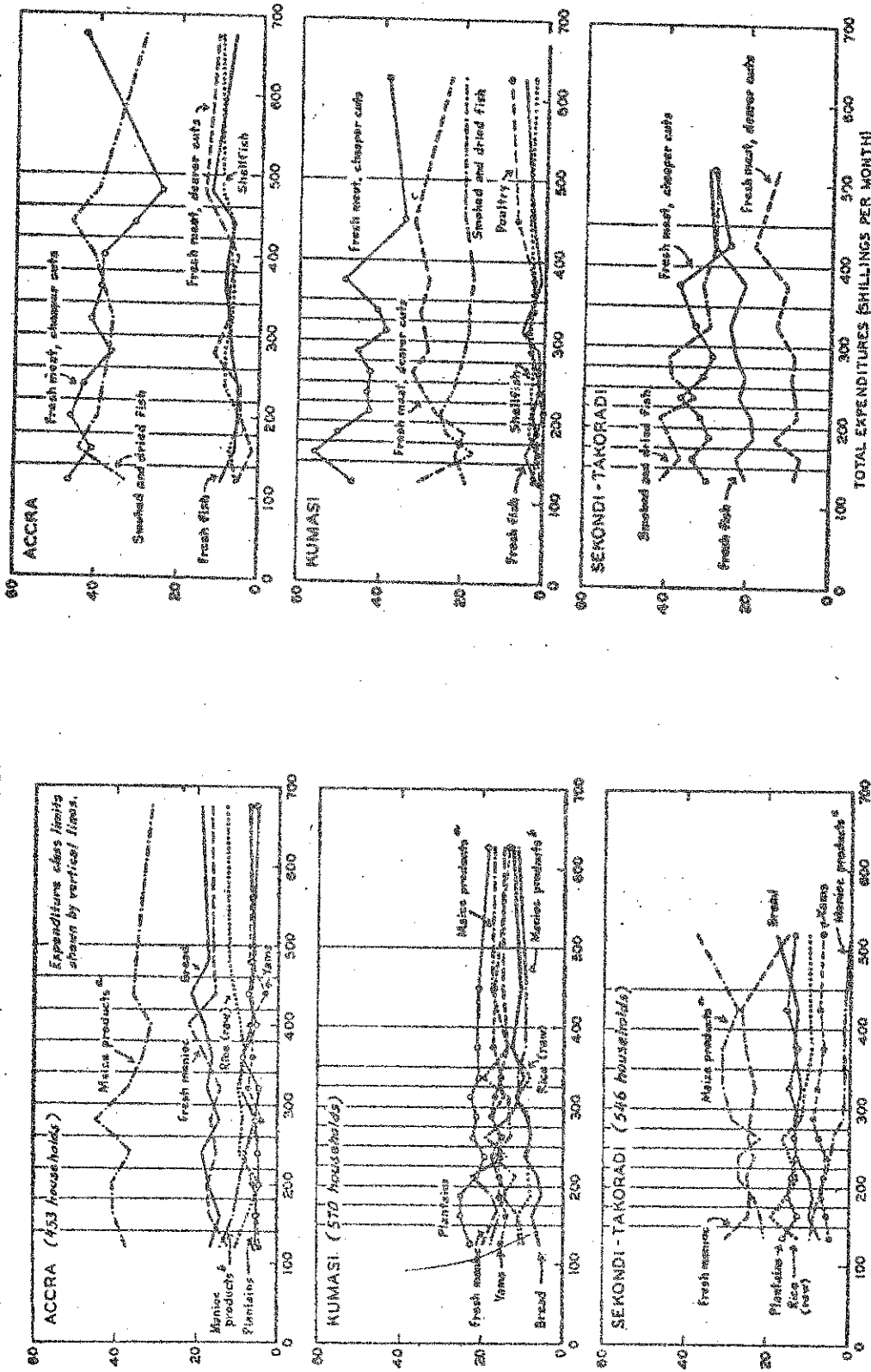


\* Reproduced from T. T. Poleman, *The Food Economics of Urban Middle Africa* (Cornell Int'l. Agric. Reprint), pp. 145, 155.

CHART 3. TYPICAL BUDGET SURVEY FINDINGS ON FOOD EXPENDITURE BEHAVIOR\*

GHANA, URBAN HOUSEHOLD BUDGET SURVEY SAMPLES, 1953 AND 1955: EXPENDITURES FOR SELECTED STAPLE FOODS AS A PERCENTAGE OF TOTAL OUTLAYS FOR THESE ITEMS, BY EXPENDITURE CLASS \*

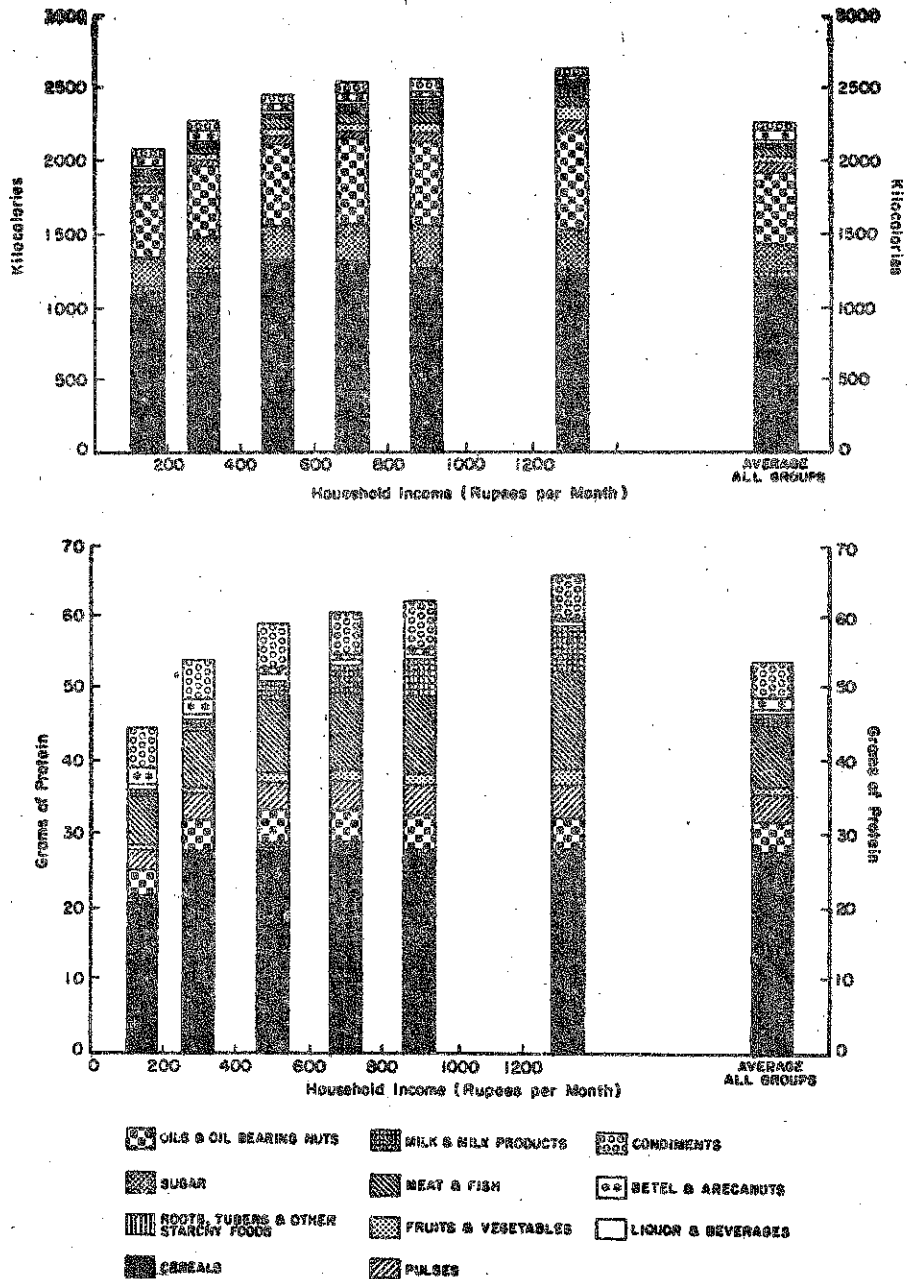
GHANA, URBAN HOUSEHOLD BUDGET SURVEY SAMPLES, 1953 AND 1955: EXPENDITURES FOR SELECTED MEAT AND FISH PRODUCTS AS A PERCENTAGE OF TOTAL OUTLAYS FOR THESE ITEMS, BY EXPENDITURE CLASS\*



\* Based on data in Gold Coast Off. Govt. Stat. (Stat. and Econ. Papers), 1953 *Area Survey of Household Budgets* (No. 2, December 1953), p. 14; *Kumasi Survey of Population and Household Budgets*, 1955 (No. 3, March 1956), p. 42; *Sekondi-Takoradi Survey of Population and Household Budgets*, 1955 (No. 4, March 1956), p. 38. Positioning of data for extreme expenditure classes reflects actual average expenditures; for other classes the mid-point.

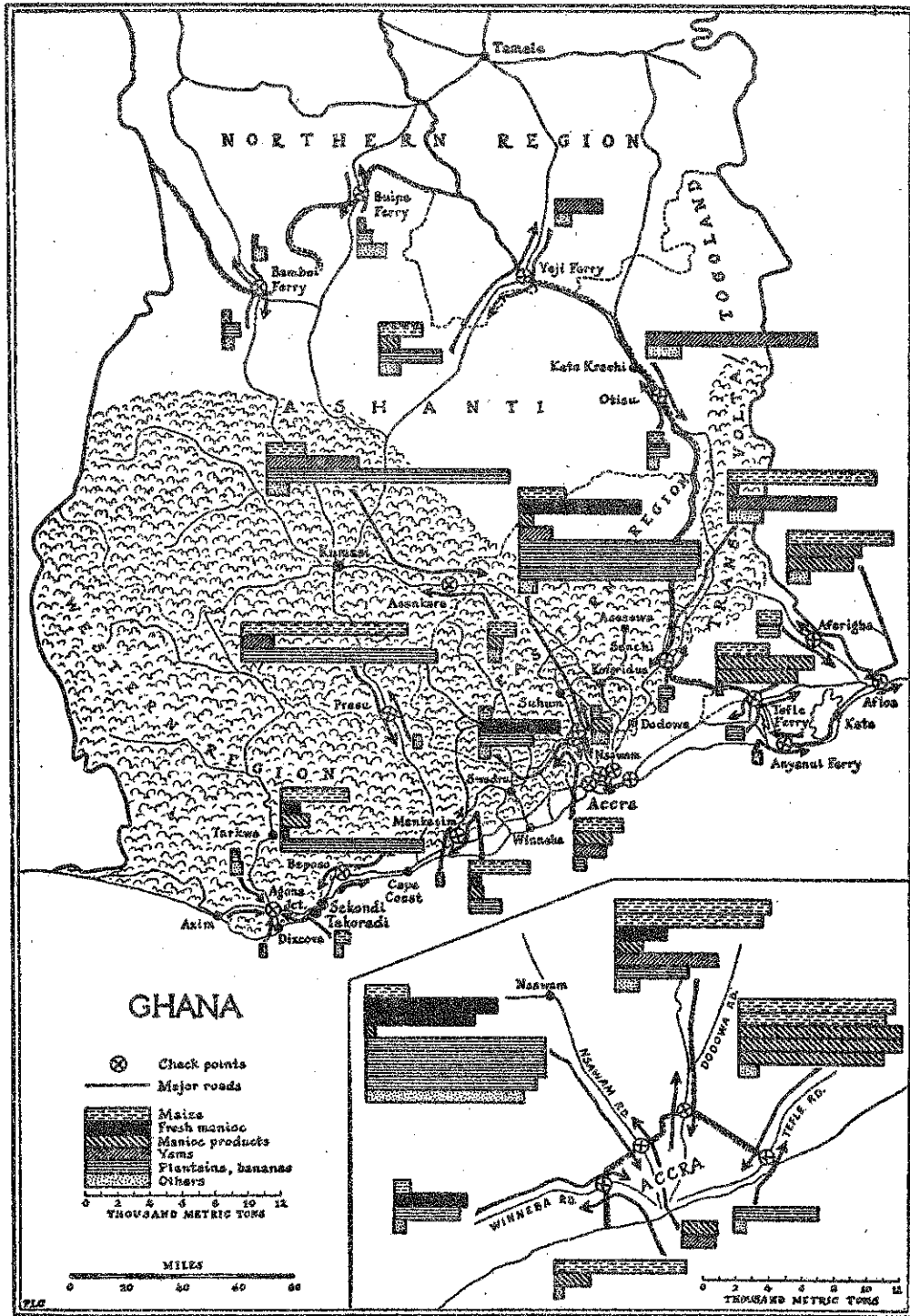
\* See source note to Chart 5B.  
 a Kenkey and dough.  
 b Gari and kokonte.  
 c Kokonte.

CHART 4. FINDINGS OF NEW TYPE BUDGET SURVEY:  
 APPARENT PER CAPITA DAILY ENERGY AND PROTEIN AVAILABILITIES  
 IN SRI LANKA, 1969-70\*



\* Reproduced from T. T. Poleman, "World Food: A Perspective," Science, 9 May 1975, p. 516.

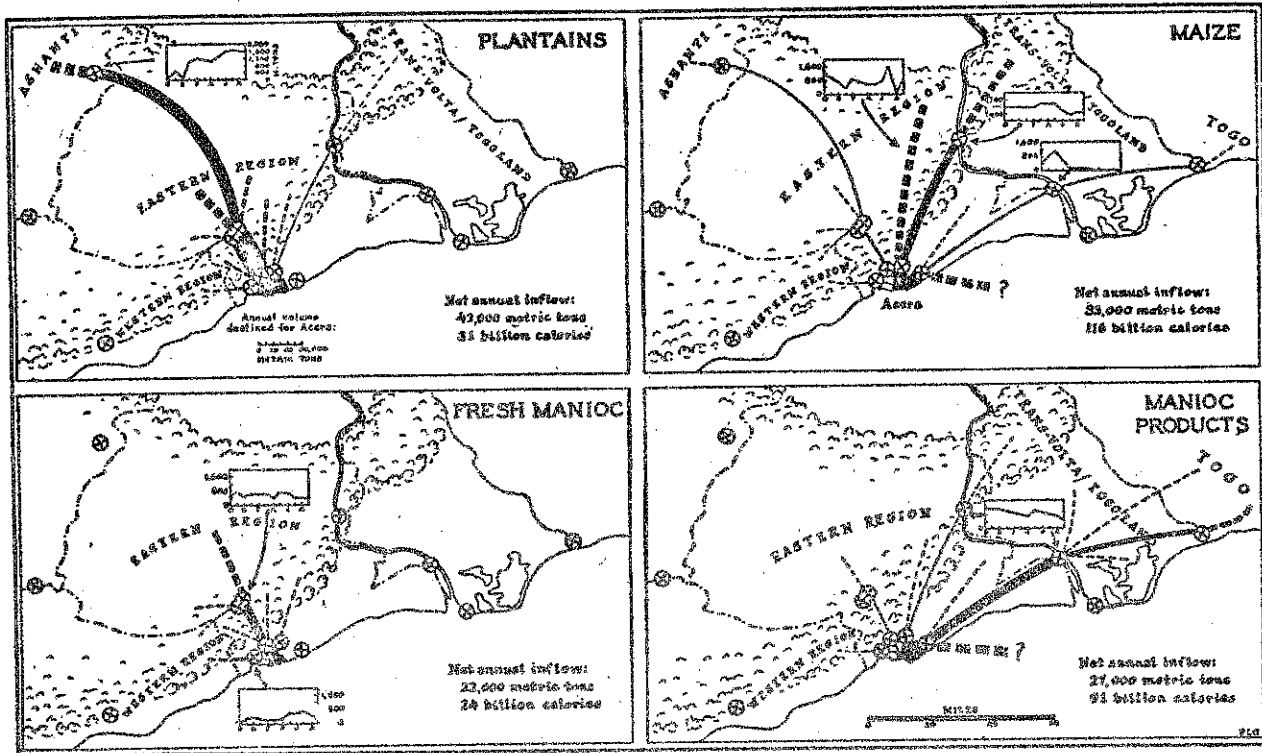
Chart 5. GHANA, PRODUCE MOVEMENT CENSUS, 1957/58: ANNUAL FLOW OF STAPLE FOODS PASSING THE SEVERAL CHECK POINTS\*



\* Based on unpublished returns from the 1957/58 Produce Movement Census. Where data reported other than by weight, tonnages were estimated using the following conversion factors: maize—bag: 220 lbs.; rice—bag: 240 lbs.; millets—bag: 204 lbs.; sorghum—bag: 200 lbs.; manioc products—bag: 150 lbs.; manioc roots—bag: 200 lbs.; cocoyams—bag: 150 lbs.; and yams—tuber: 7 lbs. Factors from Ghana, Off. Govt. Stat., "Distribution Statistics—Produce Movements. . . Conversion Factors" (n.d., mimeo.).  
Movements of less than 400 metric tons not shown.

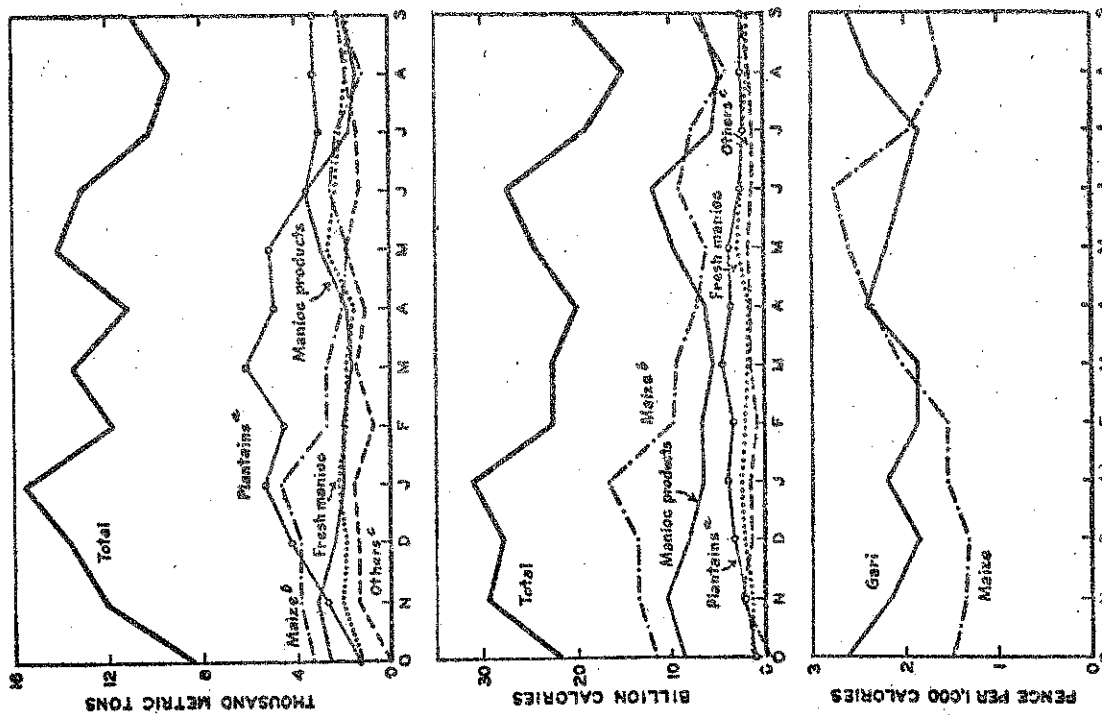
Reproduced from T. T. Poleman, The Food Economies of Urban Middle Africa (Cornell Int'l. Agric. Dev. Reprint), p. 165.

Chart 6. GHANA, PRODUCE MOVEMENT CENSUS, 1957/58: DIRECTION AND ANNUAL MAGNITUDE OF INFLOW OF PRINCIPAL STAPLE FOODS INTO ACCRA\*



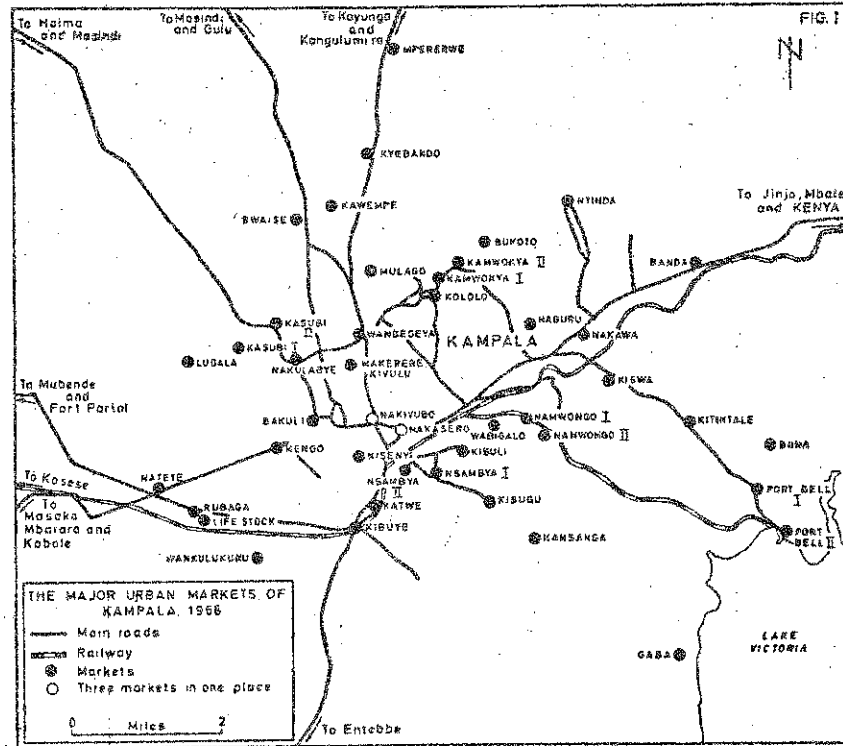
\* Based on unpublished returns from the 1957/58 Produce Movement Census.

Chart 7. GHANA, PRODUCE MOVEMENT CENSUS, 1957/58: NET MONTHLY INFLOW OF STAPLE FOODS INTO ACCRA; AND AVERAGE MONTHLY WHOLESALE PRICE OF MAIZE AND GARI IN THE ACCRA MARKET\*

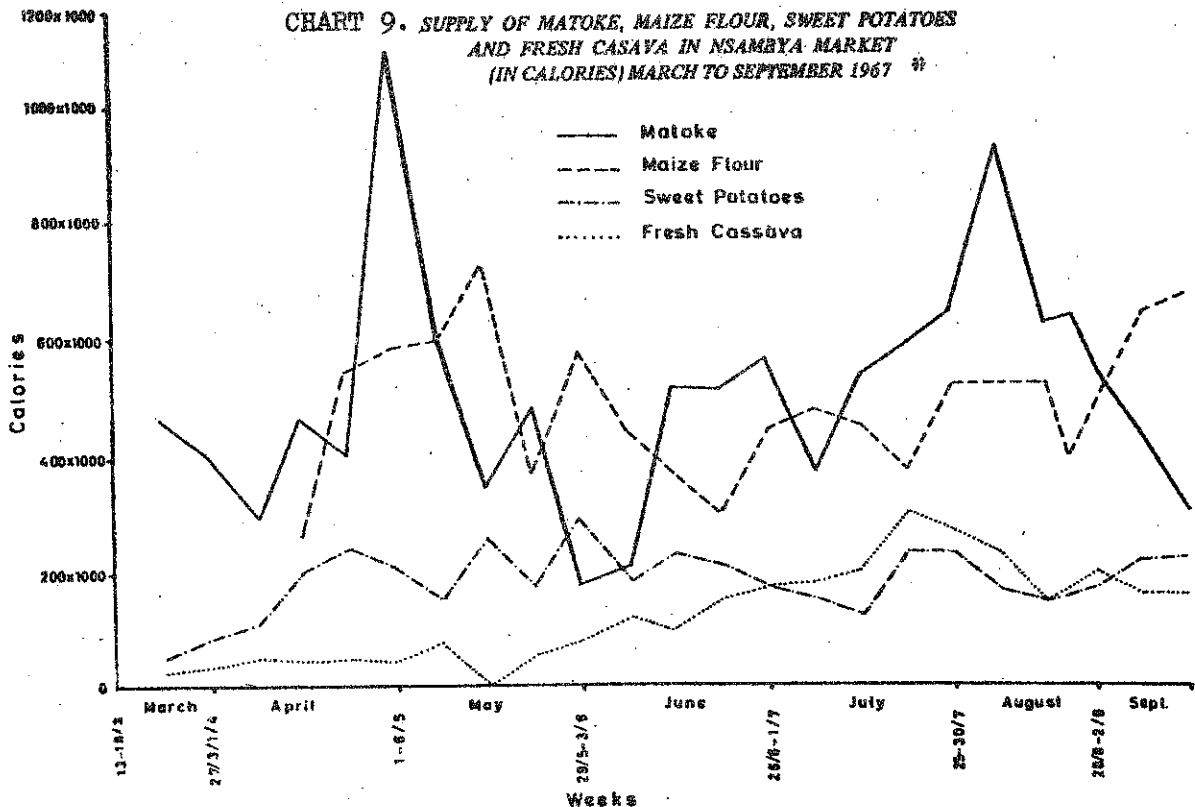


\* Net inflows based on unpublished returns from the 1957/58 Produce Movement Census; price data from Ghana, Dept. Agt., *Monthly Reports—Foodstuff Supply Position (various issues)*; caloric values calculated using conversion factors given in FAO, *Food Composition Tables—Minerals and Vitamins—For International Use* (Natr. Studies 11, 1954), pp. 10-12, 13.  
 a Includes bananas.  
 b Includes sorghum.  
 c Rice, millets, yams, cocoyams, "other cereals," and "other roots and tubers."

CHART 8. KAMPALA MARKETS MONITORED DURING PRODUCE MOVEMENT CENSUS, 1967/68\*

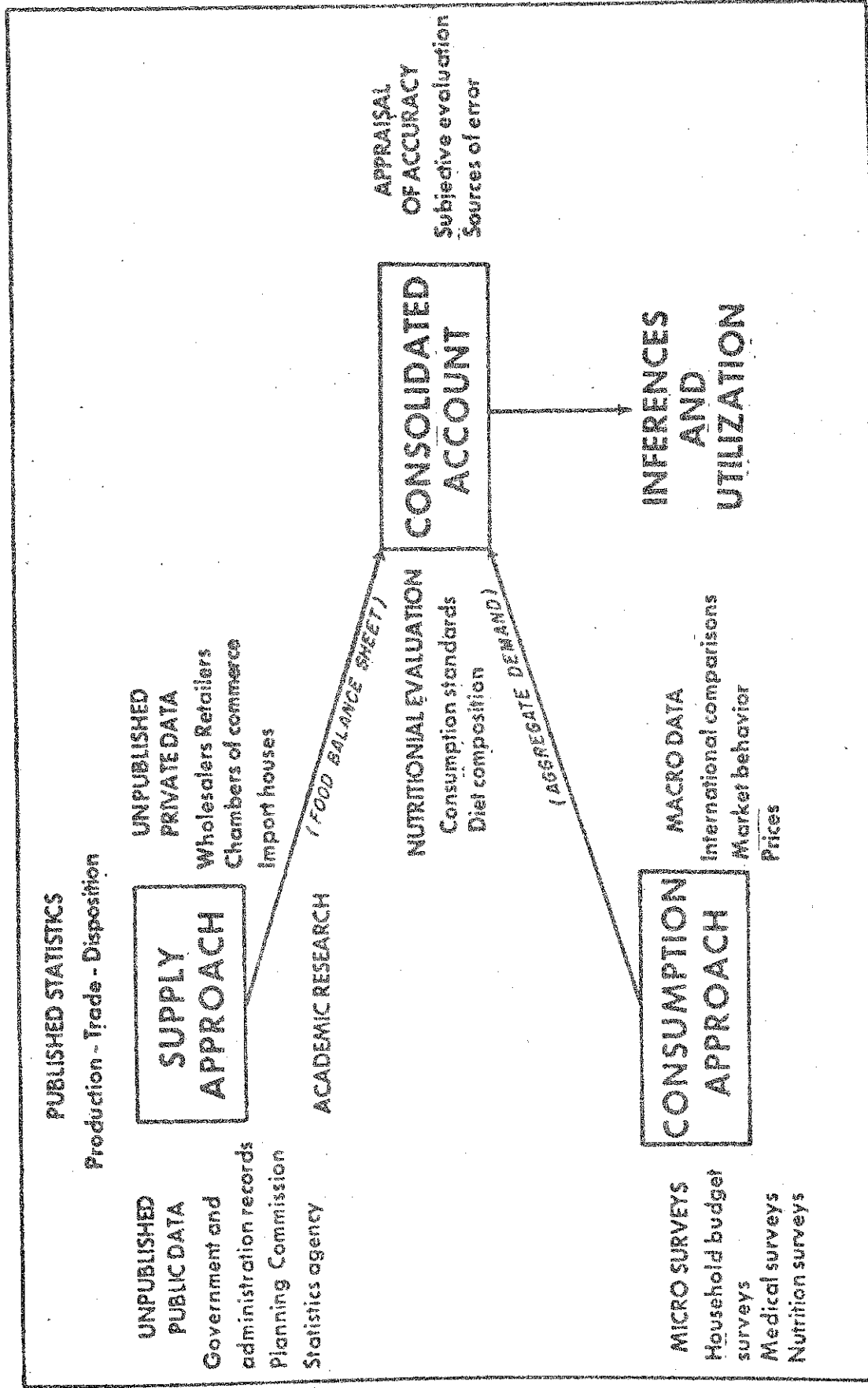


\* Reproduced from J. J. Oloya and T. T. Poleman, The Food Supply of Kampala (Makerere Institute of Social Research, July 1972), p. 16.



\* Reproduced from J. J. Oloya and T. T. Poleman, The Food Supply of Kampala (Makerere Institute of Social Research, July 1972), p. 38.

CHART 10. THE CROSS-CHECK APPROACH TO NATIONAL FOOD ACCOUNTING\*



\*Reproduced from M. J. Purvis, "Evaluation and Use of Underdeveloped Agricultural Statistics: The Food Economy of Malaysia" (Cornell Univ., unpublished Ph.D. Dissertation, 1966), p. 4.

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1. T. T. Poleman, "Quantifying the Malthusian Dilemma," in Poleman, Beeghly, Matlon, and McGregor, The Economic Applications of Vital-Rate Monitoring (Cornell Int'l. Agric. Dev. Mimeo 38, Nov. 1972).
2. M. J. Schultheis, The Statistics of the World Food Problem: A Review Essay (Cornell Agric. Econ. Staff Paper No. 15, July 1970), pp. 20-28.
3. T. T. Poleman, "Survey on Nutritional Concomitants of Urbanization in Selected Countries of Sub-Saharan Africa" (FAO, 1965) (Reprinted as Cornell Agric. Econ. Staff Paper 73-15, July 1973).

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4. H. C. Farnsworth, "Defects, Uses, and Abuses of National Consumption Data," Food Research Institute Studies, Vol. II, No. 3.
5. T. Jogaratnam and T. T. Poleman, Food in the Economy of Ceylon (Cornell Int'l. Agric. Dev. Bulletin 11, 1969), pp. 1-18.
6. E. B. Simmons and T. T. Poleman, The Food Balance Sheet as a Parameter of Tropical Food Economies: The Case of Mauritius (Cornell Int'l. Agric. Bulletin 29, June 1974), pp. 2-20, 61-73.
7. M. J. Purvis, "Evaluation and Use of Underdeveloped Agricultural Statistics: The Food Economy of Malaysia" (Cornell University, unpublished Ph.D. dissertation, 1966), pp. 62-143 (optional; for the enthusiast only).

THE CONSUMPTION SURVEY

8. T. T. Poleman, "The Food Economies of Urban Middle Africa: The Case of Ghana," Food Research Institute Studies, May 1961, pp. 135-143.
9. T. Jogaratnam and T. T. Poleman, op. cit., pp. 19-37.
10. E. B. Simmons and T. T. Poleman, op. cit., pp. 20-56.
11. M. J. Purvis, op. cit., pp. 144-209 (optional).
12. A. P. den Hartog, "Unequal Distribution of Food Within the Household," Nutrition Newsletter (FAO), Oct.-Dec. 1972, pp. 8-17.



13. FAO, Program of Food Consumption Surveys (Rome, 1964), (optional; on Mann 2-day reserve).

14. FAO, Bibliography of Food Consumption Surveys, 1964 and Supplements, 1965 and 1967 (mimeographed), (optional; on Mann 2-day reserve).

15. FAO, Review of Food Consumption Surveys 1970, Vol. 1A (Rome, 1970), (optional, on Mann 2-day reserve).

#### ROAD CHECK-CUM-MARKETING SURVEYS

16. T. T. Poleman, op. cit., pp. 161-172.

17. Gold Coast, Office of the Gov't. Stat., Agricultural Statistical Survey of South-East Akim Obuakwa, 1952-3 (Stat. and Econ. Paper No. 1, Sept. 1953).

#### OTHER TECHNIQUES

18. M. K. Bennett, "The Food Economy of the New England Indians, 1605-75," The Journal of Political Economy, October 1955.

19. D. S. Ferguson, The Nigerian Beef Industry (Conrell Int'l. Agric. Dev. Bulletin 9, 1967). (An optional skim).

CONVERSION FACTORS (These are on Mann 2-day reserve; look at them to become familiar with this type of source.)

20. FAO, Food Composition Tables - Minerals and Vitamins - for International Use (Rome, 1954).

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22. FAO, Food Composition Tables: Annotated Bibliography (Nutrition Information Documents Series 1, Rome, 1969).

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24. The Economist, Guide to Weights and Measures (2nd Ed., London, 1962), pp. 53-65.

THE SOCIO-ECONOMIC SURVEY OF CEYLON, 1969-70

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QUESTIONNAIRE

The questionnaire reproduced on the following pages was originally printed on 13 X 17-inch sheets. The questionnaire was designed and the survey supervised by Mr. L. N. Perera, then Deputy Director of Statistics, Government of Ceylon. The results of survey remain only partially published, but the data have been tested by various scholars and have yielded a wealth of information about consumer behavior. Over 8,000 households were surveyed in four rounds, each of three months duration. Between 150 and 250 staff were involved in the project.

# சமூக - பொருளாதார அளவீடு

## SOCIO - ECONOMIC SURVEY

1. இடம் மற்றும் அமைப்பு  
Location and Identification of Household

2. குடும்ப அங்கத்தினர்  
Members of Household

3. குடும்ப அங்கத்தினர்  
General Characteristics of members of Household

சமூக பொருளாதார அளவீடு  
Socio-Economic Survey

சமூக பொருளாதார அளவீடு  
Socio-Economic Survey

சமூக பொருளாதார அளவீடு  
Socio-Economic Survey

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |

### குறிப்புக்கள்

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |



IV உயிர்வாழ்வு நிலைமைகள்  
உடல்நலம் வாழ்க்கை முறைகள்  
HEALTH AND VITAL STATISTICS

A உயிர்வாழ்வு நிலைமைகள்  
Health Statistics

1. குடும்பத்தினர் அல்லது குழுவின் உறுப்பினர் ஒருவரின் பற்றிய செய்திகள்  
குறித்து குறிப்பிடுக. (உயிர்வாழ்வு நிலைமைகள், வாழ்க்கை முறைகள், குடும்பத்தினர்)  
How many members of the household, if any, suffered from any illness during the past two weeks?

2. குடும்பத்தினர் அல்லது குழுவின் உறுப்பினர் ஒருவரின் பற்றிய செய்திகள்  
குறித்து குறிப்பிடுக. (உயிர்வாழ்வு நிலைமைகள், வாழ்க்கை முறைகள், குடும்பத்தினர்)  
If so, state in brief the

- (a) நோயின் பெயர்  
Nature of illness
- (b) நோயை ஏற்படுத்திய காரணம்  
Period of absence from normal duties (No. of days)
- (c) குடும்பத்தினர் அல்லது குழுவின் உறுப்பினர் ஒருவரின் பற்றிய செய்திகள்  
Whether treatment was taken (Yes/No) (If for Yes, for no)
- (d) குடும்பத்தினர் அல்லது குழுவின் உறுப்பினர் ஒருவரின் பற்றிய செய்திகள்  
If yes, indicate source of treatment

- (a) குடும்பத்தினர் அல்லது குழுவின் உறுப்பினர் ஒருவரின் பற்றிய செய்திகள்  
Nature of illness (Enter 1)
- (b) நோயை ஏற்படுத்திய காரணம்  
Period of absence from normal duties (Enter 2)
- (c) குடும்பத்தினர் அல்லது குழுவின் உறுப்பினர் ஒருவரின் பற்றிய செய்திகள்  
Whether treatment was taken (Enter 3)
- (d) குடும்பத்தினர் அல்லது குழுவின் உறுப்பினர் ஒருவரின் பற்றிய செய்திகள்  
If yes, indicate source of treatment (Enter 4)

உயிர்வாழ்வு நிலைமைகள்  
Health Statistics

V உயிர்வாழ்வு நிலைமைகள்  
உடல்நலம் வாழ்க்கை முறைகள்  
RELIGIONAL, CULTURAL AND RELIGIOUS ACTIVITIES

1. குடும்பத்தினர் அல்லது குழுவின் உறுப்பினர் ஒருவரின் பற்றிய செய்திகள்  
குறித்து குறிப்பிடுக. (உயிர்வாழ்வு நிலைமைகள், வாழ்க்கை முறைகள், குடும்பத்தினர்)  
No. of members of the household who are members of:

- (a) சமயம், சமயம்  
Religious societies
- (b) சமயம், சமயம்  
Religious societies
- (c) சமயம், சமயம்  
Religious societies
- (d) சமயம், சமயம்  
Religious societies
- (e) சமயம், சமயம்  
Religious societies
- (f) சமயம், சமயம்  
Religious societies
- (g) சமயம், சமயம்  
Religious societies
- (h) சமயம், சமயம்  
Religious societies
- (i) சமயம், சமயம்  
Religious societies
- (j) சமயம், சமயம்  
Religious societies
- (k) சமயம், சமயம்  
Religious societies
- (l) சமயம், சமயம்  
Religious societies
- (m) சமயம், சமயம்  
Religious societies
- (n) சமயம், சமயம்  
Religious societies
- (o) சமயம், சமயம்  
Religious societies
- (p) சமயம், சமயம்  
Religious societies
- (q) சமயம், சமயம்  
Religious societies
- (r) சமயம், சமயம்  
Religious societies
- (s) சமயம், சமயம்  
Religious societies
- (t) சமயம், சமயம்  
Religious societies
- (u) சமயம், சமயம்  
Religious societies
- (v) சமயம், சமயம்  
Religious societies
- (w) சமயம், சமயம்  
Religious societies
- (x) சமயம், சமயம்  
Religious societies
- (y) சமயம், சமயம்  
Religious societies
- (z) சமயம், சமயம்  
Religious societies

2. குடும்பத்தினர் அல்லது குழுவின் உறுப்பினர் ஒருவரின் பற்றிய செய்திகள்  
குறித்து குறிப்பிடுக. (உயிர்வாழ்வு நிலைமைகள், வாழ்க்கை முறைகள், குடும்பத்தினர்)  
How many members of the household, if any, attended a theatrical or cultural show at least once during the preceding month?

- 1. சமயம், சமயம்  
Daily newspaper
- 2. சமயம், சமயம்  
Weekly publication
- 3. சமயம், சமயம்  
Monthly, quarterly or annual publication

|              |             |              |             |
|--------------|-------------|--------------|-------------|
| சமயம்<br>Yes | சமயம்<br>No | சமயம்<br>Yes | சமயம்<br>No |
| சமயம்<br>Yes | சமயம்<br>No | சமயம்<br>Yes | சமயம்<br>No |

உயிர்வாழ்வு நிலைமைகள்  
Health Statistics



















