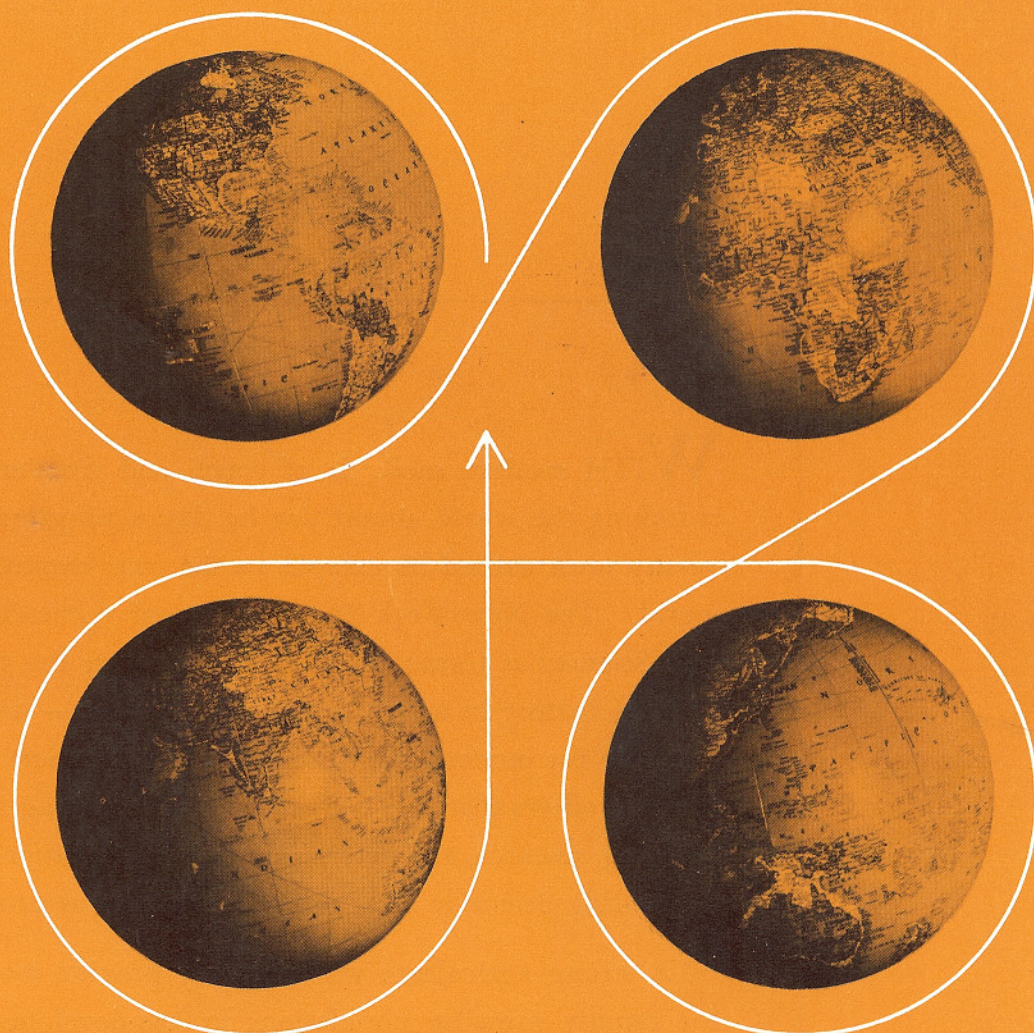


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ON FOOD HABITS IN CEYLON:**
THE FINDINGS OF THE SOCIO-ECONOMIC SURVEY

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THE EFFECT OF INCOME ON FOOD HABITS IN CEYLON:
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By

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It is generally accepted that on the average food availabilities in Ceylon are sufficient for adequate nutrition of the people. The food balance sheets prepared by the Statistics Department and others (1) have consistently pointed to per capita availabilities on the order of 2,100 calories per day and of about 45 grams of protein. "Requirements"--that is, the recommended allowances suggested by nutritionists--are generally believed to be of this magnitude.

What has not been clear is how this marginally satisfactory average picture breaks down over the income range. Ocular inspection and common sense lead us to the conclusion that any food problem will be most acute among the poor--and the limited number of small nutrition surveys carried out by the Medical Research Institute among the poor have indicated clear evidence of inadequate nourishment--but until recently we have lacked statistically meaningful evidence. The 1953 and 1963 Consumer Surveys done by the Central Bank, hitherto our chief insights into the effect of income on consumer behavior, collected only expenditure data and for a limited number of food items.

The situation has now been remedied by the Socio-Economic Survey carried out in 1969/70 by the Department of Census and Statistics among 9,700 households, so sampled as to be indicative of the full income range. Among the data collected for each household were seven-day recall information on expenditures for, and quantities purchased of, no fewer than 111 food items.

This paper presents, in largely graphic form, a summary of the key findings.

1. The 1969/70 Socio-Economic Survey

Detailed descriptions of the survey may be found elsewhere; the preliminary report of the first two rounds was released in October 1971 (2), and the Department of Census and Statistics will publish the results of all four rounds--on which the present paper is based--shortly. Suffice it to say that the survey was carried out in four successive rounds of three months beginning in November 1969, and amassed a wealth of evidence on living conditions of households with special reference to income and expenditure. Additional information on the demographic characteristics of the population, fertility and morbidity, employment and unemployment, educational levels, and housing conditions was also collected.

The household was taken as the basis of the survey, with the household defined as a group of two or more persons, related or unrelated, who combine to occupy the whole or part of a housing unit and jointly provide themselves with food and other living essentials. Thus servants were included in the household, for all practical purposes as members of the family; while persons living alone or in professional boarding houses or institutions were not covered.

For the purposes of the survey the 22 administrative districts of Ceylon were stratified into Urban, Rural, and Estate Sections. The Urban Sector comprised all Municipal, Urban and Town Council areas. The Estate Sector included all estates over 20 acres in extent and having ten or more resident workers. The balance constituted the Rural Sector. The sample was made self-weighting at the sector level.

A total of 9,694 households were interviewed, broken down by sector and income as shown in Table 1. It will be seen that only in the higher income classes in the Estate Sector was the number of households sampled sufficiently small to give rise to possible errors in extrapolation.

The income stratification is believed to be reasonably accurate, though it is the general experience in surveys of this nature that incomes tend to be understated. An attempt was made to incorporate income in kind as well as money income. The consumption of home produced foodstuffs was valued at prevailing prices and added as an income item. Excluded, however, was an imputed value for the one free measure of rice distributed weekly during the period of the survey. This omission is not without significance; but what price to attach?

The income breakdown given in Table 1 implies that 43 percent of the households in Ceylon have incomes of less than Rs.200, 37 percent between Rs.200 and Rs.400, 12 percent between Rs.400 and Rs.600, 4 percent between Rs.600 and Rs.800, and 2 percent each for the classes of between Rs.800 and Rs.1000, and over Rs.1000. It is well to keep this distribution in mind when reflecting on the implications of the charts that follow.

Whereas most of the data collected during the survey had a month as its point of reference, daily information was got on food and drink for a period of a week. In the case of those non-perishable food items--condiments, sugar, tea, coffee and the like--which households normally purchase in quantities in excess of weekly needs, consumption was estimated on a pro rata basis. For example, if a household purchased 30

TABLE 1. CEYLON SOCIO-ECONOMIC SURVEY, 1969/70:
NUMBER OF HOUSEHOLDS SAMPLED AND ESTIMATED
HOUSEHOLDS, BY SECTOR AND INCOME CLASS

	All Island	Urban Sector	Rural Sector	Estate Sector
Under Rs.200				
Sampled	3,694	845	1,615	1,234
Estimated	892,270	72,085	668,453	151,732
Rs.200 - 400				
Sampled	3,653	1,597	1,391	665
Estimated	789,658	136,055	570,789	82,814
Rs.400 - 600				
Sampled	1,242	722	441	79
Estimated	251,131	61,570	179,795	9,766
Rs.600 - 800				
Sampled	487	336	136	15
Estimated	86,913	28,860	56,088	1,965
Rs.800 - 1000				
Sampled	248	205	40	3
Estimated	34,358	17,495	16,536	327
Rs.1000 and over				
Sampled	370	332	34	4
Estimated	42,407	27,850	14,022	535
ALL CLASSES				
Sampled	9,694	4,037	3,657	2,000
Estimated	2,096,737	343,915	1,505,683	247,139

pounds of sugar a month, then the weekly consumption would be about 7 pounds. In such cases, daily entries were not made, but only the total applicable to the survey week.

Similarly with commodities consumed during the week but purchased at some other time: the actual quantities consumed were recorded and value imputed. In the case of commodities purchased in tiny quantities by the poor--so many cents worth of leafy vegetables, for instance--value was first recorded and quantities estimated from prevailing prices.

With regard to liquor consumption, the field staff were asked to check individually with each adult reputed to partake as to expenditures. Where quantities could be inferred they were. However, as this called for simultaneous evaluation of veracity, sobriety and the quality of the lubricant--something few can do without personal participation--the results may not be overly trustworthy. They doubtless understate.

The weekly data on food and drink were then "blown up" to a monthly basis to render them compatible with the rest of the survey. Subsequently the quantity information was converted to the daily per capita basis commonly employed by nutritionists and food economists. To these data, in turn, were applied the nutritional conversion factors shown in Table 2.

In the first column is the portion of the food which is edible as commonly purchased. The second column shows the unit by which the item is usually sold in Ceylon. Shown in the third column is the gram equivalent of this unit. The remaining columns show the nutrient composition per 100 grams of edible portion.

TABLE 2. NUTRIENT CONVERSION FACTORS FOR CEYLON

Edible Portion	Unit	Gram Equivalent	Per 100 grams of Edible Portion								
			Calo-ries	Pro-tein	Fat	Cal-cium	Iron	Vit. A	Vit. B ₂		
										(g.)	(g.)
CEREALS											
Rationed Rice	100	lb.	454.4	345	6.8	0.5	10	3.1	0	0.06	
Unrationed Rice	100	lb.	454.4	349	6.5	0.4	9	4.0	0	0.09	
Wheat Flour	100	lb.	454.4	348	11.0	0.9	23	2.5	43	0.07	
Bread	100	lb.	454.4	245	7.8	0.7	11	1.1	-	-	
Kurakken	100	lb.	454.4	328	7.3	1.3	344	17.4	70	0.10	
Maize, dry	100	lb.	454.4	342	11.1	3.6	10	2.0	150	0.10	
NUTS											
Coconut	100	no.	340.8	444	4.5	41.6	10	1.7	0	0.10	
Ground Nut	70	no.	1.0	349	26.7	40.1	50	1.6	63	0.30	
Gingelly Seeds	100	lb.	454.4	563	18.3	43.3	1,450	10.5	100	0.11	
OILS and FATS											
Coconut Oil	100	botl.	745.5	900	-	100.0	-	-	-	-	
Gingelly Oil	100	botl.	745.5	900	-	100.0	-	-	-	-	
Butter	100	lb.	454.4	729	-	81.0	18	-	3,200	-	
Margarine	100	lb.	454.4	770	-	85.4	3	0.3	1,998	-	
SUGARS											
White Sugar	100	lb.	454.4	398	-	-	12	-	-	-	
Jaggery	100	lb.	454.4	340	11.0	0.2	65	-	-	-	
YAMS											
Potatoes	95	lb.	454.4	97	1.6	0.1	10	0.7	40	0.01	
Sweet Potato	85	lb.	454.4	120	1.2	0.3	20	0.8	10	0.04	
Manioc	85	lb.	454.4	157	0.7	0.2	50	0.9	-	0.10	
Yam, ordinary	85	lb.	454.4	111	2.5	0.1	60	-	130	-	

(continued . . .)

TABLE 2. NUTRIENT CONVERSION FACTORS FOR CEYLON (continued)

VEGETABLES, LEAFY										
Kankun	70	bndl.	170.4	31	2.8	-	109	3.6	3,824	0.05
Mikunuwenna	70	bndl.	142.0	84	5.6	-	200	16.0	3,060	0.08
Gotukola	70	bndl.	42.6	49	3.8	-	210	9.4	2,760	0.05
Sarana	70	bndl.	227.2	21	1.4	-	52	0.9	2,480	0.05
Thampala	70	bndl.	85.0	20	3.8	-	200	3.5	9,200	0.03
Nivithi	70	$\frac{1}{2}$ lb.	227.2	21	1.7	-	108	2.4	9,300	0.07
Kohila Leaves	70	bndl.	113.6	21	1.8	-	200	2.4	1,760	0.03
VEGETABLES, SEASONAL										
Jak Tender	80	lb.	454.4	51	2.6	0.3	30	1.7	0	0.11
Jak Seeds	80	lb.	454.4	133	6.6	0.4	50	1.5	17	0.11
Bread Fruit	70	2 lbs.	908.8	95	1.4	0.4	32	1.1	9	-
Drumstick	83	lb.	454.4	26	2.5	0.1	30	5.3	184	0.07
VEGETABLES, UPCOUNTRY										
Tomatoes	100	lb.	454.4	20	0.9	0.2	48	0.4	585	0.06
Cabbage	88	lb.	454.4	27	1.8	0.1	39	0.8	2,000	0.03
Carrots	95	lb.	454.4	48	0.9	0.2	80	2.2	3,150	0.02
Beetroot	85	lb.	454.4	43	1.7	0.1	200	1.0	-	0.09
Radish	99	lb.	454.4	17	0.7	0.1	50	0.4	5	0.02
Beans	90	lb.	454.4	35	2.1	-	63	1.4	151	0.11
Leeks	50	lb.	454.4	77	1.8	0.1	50	2.3	30	-
VEGETABLE FRUIT										
Ash-plantain	58	lb.	454.4	64	1.4	0.2	10	0.6	50	0.02
Brinjals	91	lb.	454.4	24	1.4	0.3	10	0.9	124	0.11
Bandakkas	84	lb.	454.4	35	1.9	0.2	10	1.5	88	0.10
Cucumber	83	lb.	454.4	13	0.4	0.1	10	0.8	-	0.01
Ash Pumpkin	67	lb.	454.4	10	0.4	0.1	30	0.1	-	0.01
Snake Gourd	98	lb.	454.4	18	0.5	0.3	50	1.6	-	0.06
Wattakolu	82	lb.	454.4	17	0.5	0.3	50	1.6	-	0.06
Bitter Gourd	97	lb.	454.4	25	1.6	0.2	40	1.8	210	0.06
Red Pumpkin	79	lb.	454.4	25	1.6	0.2	20	0.7	210	0.09
Kohila Yams	96	lb.	454.4	25	1.4	0.1	20	0.7	84	0.04

(continued . . .)

TABLE 2. NUTRIENT CONVERSION FACTORS FOR CEYLON (continued)

FRUITS										
Plantains	74	no.	42.6	104	1.1	0.1	10	0.5	124	0.17
Papaws	75	no.	908.8	32	0.6	0.1	17	-	1,110	0.25
Pineapple	60	no.	1,363.2	46	0.4	0.1	23	1.2	30	0.12
Oranges	66	no.	170.4	53	0.9	0.3	50	0.1	326	0.06
Mangoes	85	no.	170.4	51	0.6	0.1	10	0.3	4,800	0.05
PULSES										
Dhall	100	lb.	454.4	343	25.1	0.7	69	4.8	450	0.49
Green Gram	100	lb.	454.4	348	24.5	1.2	75	8.5	83	0.15
Cow Pea	100	lb.	454.4	327	24.6	0.7	79	11.0	60	0.45
MEATS										
Beef	77	lb.	454.4	114	22.6	2.6	10	0.8	18	1.47
Mutton	74	lb.	454.4	118	21.4	3.6	150	2.5	31	1.70
Pork	82	lb.	454.4	371	14.0	35.0	30	2.2	-	0.09
Poultry	67	lb.	454.4	109	25.9	0.6	25	2.1	-	1.46
FISH										
Large Fresh Fish	65	lb.	454.4	155	19.1	7.8	357	4.4	26	0.50
Small Fresh Fish	60	lb.	454.4	106	20.7	2.2	357	6.3	26	0.30
Sprats Dried	73	lb.	454.4	245	50.7	4.0	1,095	2.8	270	0.10
Dried Fish	73	lb.	454.4	245	50.7	4.0	179	2.1	49	0.20
Preserved Fish	100	lb.	454.4	204	42.2	3.0	179	2.1	49	0.20
Canned Fish	100	lb.	454.4	172	21.0	9.8	67	1.0	98	0.50
MILK and MILK PRODUCTS										
Fresh Milk	100	botl.	738.8	67	3.2	4.1	120	0.2	174	0.20
Milk, Powdered	100	lb.	454.4	496	25.8	26.7	950	0.6	1,400	0.80
Milk Foods	100	lb.	454.4	496	25.8	26.7	950	0.6	1,400	0.80
Condensed Sweetened Milk	100	lb.	397.6	317	7.3	8.4	273	-	430	0.40
Eggs (1)	88	no.	42.6	173	13.3	13.3	60	2.1	1,200	0.20

(continued . . .)

TABLE 2. NUTRIENT CONVERSION FACTORS FOR CEYLON (continued)

BEVERAGES									
Tea	lb.	454.4	38	9.8	-	32	-	-	1.00
Coffee	lb.	454.4	46	4.5	-	56	-	-	1.00
Mineral Water (aerated)	botl.	40 ml.	nk	-	-	-	-	-	-
LIQUOR									
Toddy, Sweet Coconut	botl.	745.5	59	0.2	-	10	1.3	-	-
Toddy, Fermented Coconut	botl.	745.5	30	0.1	0.3	8	1.1	-	-
Arrack, Coconut	botl.	745.5	210	-	-	-	-	-	-
BETEL and ARECANUTS									
Betel Leaves	no.	6.1 g.	44	3.1	0.8	230	7.0	9,600	0.03
Arecanut	no.	35.5 g.	248	4.9	4.4	50	1.5	5	-
Chew of Betel*		8.9	25	0.6	0.4	18	0.5	586	-
CONDIMENTS									
Dried Chillies	100	454.4	246	15.9	6.2	160	2.3	576	0.43
Green Chillies	90	454.4	29	2.9	0.6	30	1.2	292	0.29
Red Onions	100	454.4	59	1.8	0.1	40	1.2	25	0.02
Bombay Onions	100	454.4	49	1.2	-	180	0.7	-	0.01
Pepper, Dry	95	454.4	304	11.5	6.8	460	16.5	1,800	0.14
Garlic, Dry	85	454.4	145	6.3	0.1	30	1.3	0	0.23
Cumin Seed	100	454.4	356	18.7	15.0	1,080	31.0	870	0.36
Mustard	100	454.4	541	22.0	39.7	490	17.9	270	-
Mathe Seed	100	454.4	333	26.2	5.8	160	14.1	160	0.29
Coriander	100	454.4	288	14.1	16.1	630	17.9	1,570	0.35
Limes	77	21.3	59	1.5	1.0	90	0.3	-	-
Tamarind	100	454.4	285	3.1	0.1	170	10.9	100	0.07
Maldiva Fish	100	454.4	204	42.2	3.9	179	2.1	49	0.20

*One betel leaf and a piece of arecanut.

These conversion factors were prepared by the Nutrition Department of the Medical Research Institute and were subsequently approved by the Nutrition Division of FAO in Rome. They can reasonably be used by other workers in Ceylon with one note of caution. The figures for coconuts are based on an average kernal weight of 12 ounces. While this may not be an unreasonable figure--it reflects the results of several years work at the M.R.I.--it seems quite evident that the average size of nut can vary from year to year and that different income groups may buy coconuts of different sizes. The poor in America complain that economies of scale elude them; that they cannot afford the "giant, economy size." How this operates in Ceylon we do not know. But, as we shall see, coconut looms large in the diet across the income range. If in fact the several income classes purchase nuts of different sizes, our figures could be off the mark by plus or minus 100 calories per person per day.

2. Food in the Household Budget

The first of our charts shows the place of food in the Ceylonese household budget. The chart is noteworthy in several respects. First of all, it brings out the overwhelming importance of food as an item of expenditure. Among households in the under Rs.200 class fully two-thirds of expenditures are for food and drink; if liquor is added the percentage rises to 71 percent. The average figures for all households are similarly high: 55 to 61 percent, respectively.

This importance of food persists throughout the income spectrum. As income increases it is to be expected that the relative magnitude of food expenditures will decline; a certain level of sufficiency in food consump-

tion is reached beyond which, out of every further increase, a higher percentage is devoted to other goods and services. What is striking is the limited extent to which this familiar Engelian relationship operates. Not until the Rs.600-800 class is reached do food expenditures fall below 50 percent; that is, among only eight percent of households.

Two factors help explain this pattern. One is that household income in Ceylon is to an appreciable extent a function of size. As Chart 1 shows, the under Rs.200 class averaged five persons, whereas the figure rises to over seven in the Rs.400-600 class. More people, more income producers. This relationship, of course, does not carry through the full income range. The large size of upper income households clearly reflects the presence of servants.

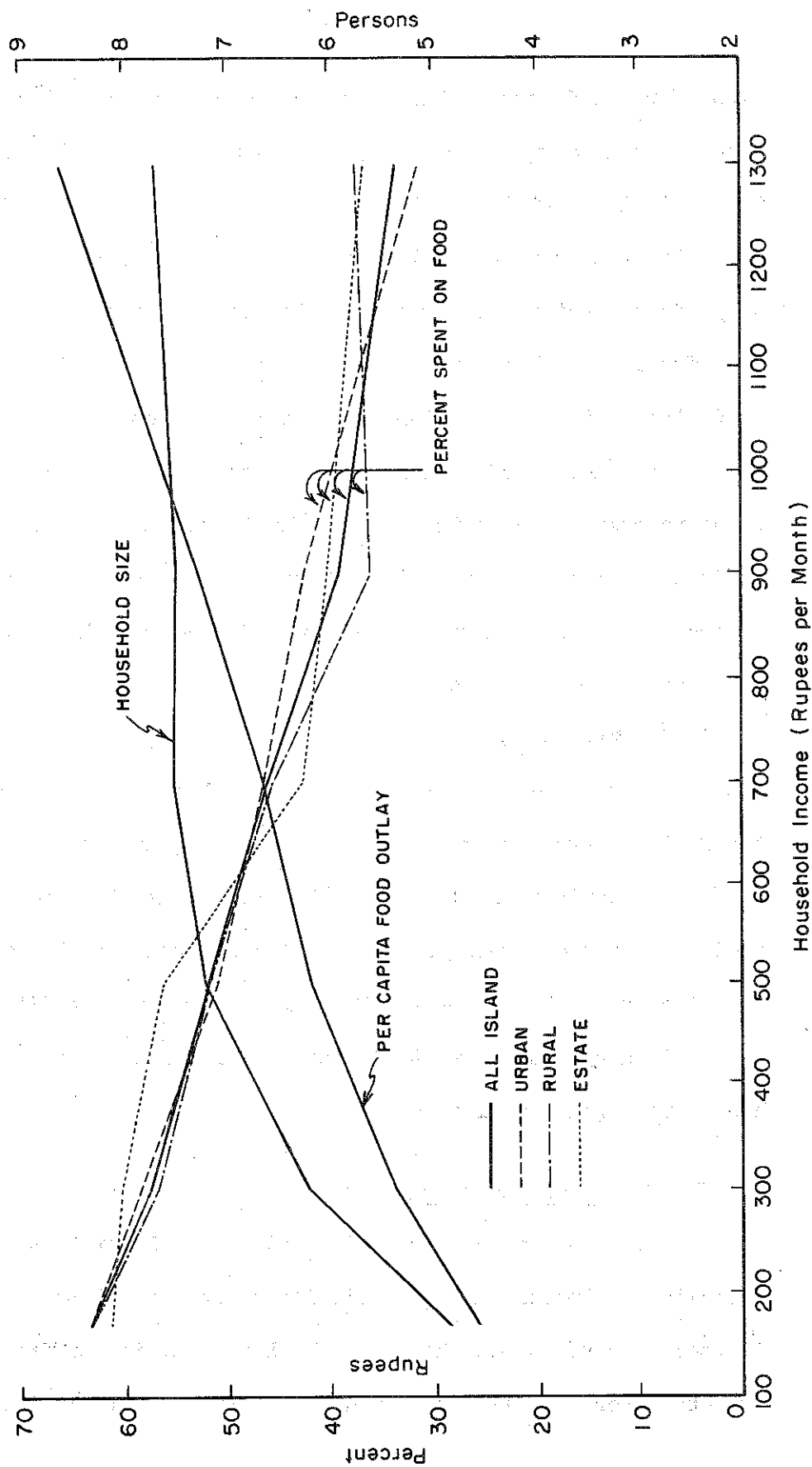
The other explanation of the comparatively modest drop-off in the importance of food with rising income is that absolute per capita outlays for food are greater among the wealthier. Again the All-Island relationship is shown in Chart 1. In the lowest income class per capita monthly food expenditures averaged Rs.30, but increased steeply over the next two classes, to level out at about Rs.55 among the wealthy.

This suggests substantial changes (and improvements) in feeding habits take place as income rises.

3. The Effect of Income on Diet

In fact the changes are quite modest--at least by Western standards. Economic development has historically brought about substantial changes in food habits. Among the poor--whether countries or individuals--diets are characteristically dominated by the starchy-staple foods: the cereals

CHART I. CEYLON SOCIO-ECONOMIC SURVEY 1969/70: PERCENT OF TOTAL EXPENDITURE SPENT ON FOOD, PER CAPITA MONTHLY FOOD OUTLAYS AND HOUSEHOLD SIZE, BY INCOME CLASS



and starchy fruits, roots, and tubers. This for a very simple reason: their cheapness, whether expressed in terms of market price or production cost. As a general rule, less land and less labor expense are required to produce calories of energy value in the form of starchy staples than in the form of other foodstuffs. Rice is the premier starchy staple of Monsoon Asia for obvious agronomic reasons, just as wheat, maize and potatoes are for more temperate climates.

As countries or individuals develop and grow more wealthy, the tendency is for the relative importance of the starchy staples in the diet to decline. More expensive foods can be produced and purchased; steaks, eggs, dairy products, and vegetables progressively take the place of the cereals.

A convenient indicator of this adjustment is the starchy staple ratio: the proportion of total calories contributed by the starchy staples. In the United States this stood at about 70 percent a century ago. Today, as bread and potatoes no longer bulk large in the diet, it stands at about 25 percent. Similar transformations have occurred and are occurring throughout the world, and are usually clearly visible across the income range in a given country.

Not so in Ceylon. The starchy staple ratio, which stands at a 55 percent average for all persons, ranges from only 56 percent in the lowest income class to 53 in the Rs.600-800 class. Only in the highest class, two percent of the population, does it fall below 50 percent--plummeting to 48 percent. Rice is all pervasive.

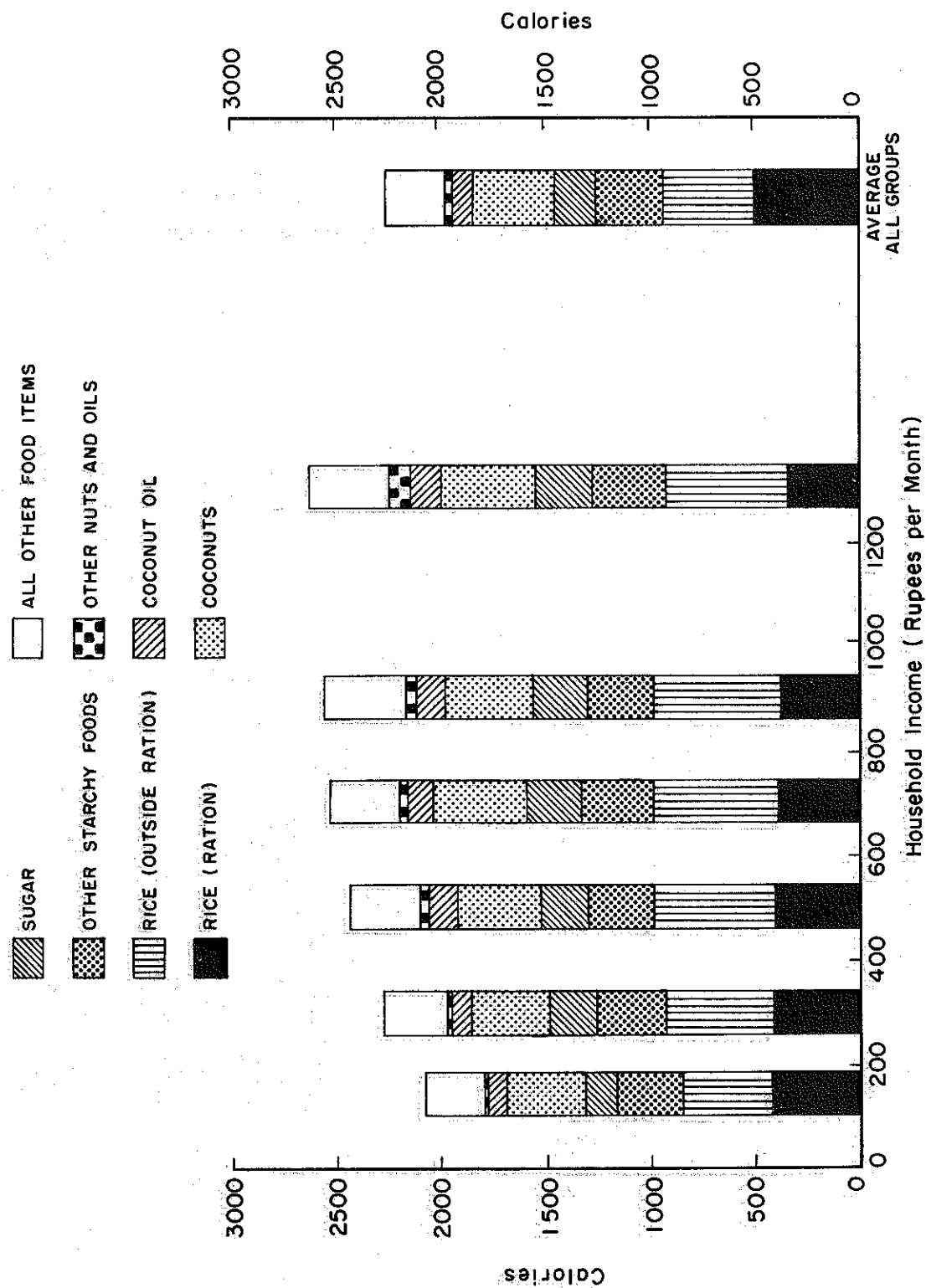
Still, certain changes in food patterns are discernible over the income range. Apparent per capita daily intake of calories is illustrated in Chart 2. It will be seen that there is a progressive increase in apparent intake as incomes rise, with the lowest income group having 2,060 calories, the highest 2,640. To what extent this difference reflects actual variation in intake we do not know. The figures represent "apparent consumption." Between availabilities and actual ingestion a certain wastage takes place in the form of spoilage, cooking losses, and plate waste. This will vary enormously, depending on the type food, storage facilities, purchasing patterns, and the like. FAO has (in its exuberance to attach numbers to the unquantifiable) suggested 15 percent as a global figure. It would certainly be much lower among the poor in Ceylon, and perhaps the better off as well.

Apart from this difference in total apparent consumption, the most significant revelation of the Chart is how little diets vary across the income range. Even the wealthiest continue to eat rationed rice, the basic nature of their meals being essentially that of the less well-to-do.

Other tendencies are more clearly identifiable in Chart 3, in which are plotted the caloric contributions of the principal food groups. Here we begin to discern signs of the expected. Betel intake declines with income, as does liquor consumption. The former confirms the notion that wealth breeds gentility; the latter that it was acquired by skillful lying. Even more significant, the consumption of milk and milk products is seen to rise with income, together with meat and fish, and fruits and vegetables.

Because these "protective foods" are modest in caloric content but (apart from fruits and vegetables) high in protein, the importance of these

CHART 2. CEYLON SOCIO-ECONOMIC SURVEY 1969/70: APPARENT PER CAPITA DAILY CALORIE CONSUMPTION, BY MAJOR FOOD ITEMS AND INCOME CLASS



changes is better illustrated by Chart 4. Here is plotted the contribution of the principal food groups to total protein availabilities. Consumption of milk and milk products rises particularly steeply. It should be noted, however, that the bulk of these improvements occur after the Rs.400 threshold is crossed; that is, among only 20 percent of the population.

In the West the general experience has been for animal proteins to replace proteins of vegetable origin as wealth increases. As Charts 4 and 5 show, this does not happen in Ceylon. Because the principal sources of vegetable protein--rice, the pulses and coconuts--are eaten undiminished as income goes up, the animal proteins are added to them.

4. Nutritional Implications

An assessment of the evidence provided by the Socio-Economic Survey from the nutritional point of view is not easy. The general level of protein and calorie availabilities approximates the general level of recommended allowances. But in both there is margin for error.

As presently set forth by MRI's Nutritional Department, recommended minimal allowances for Ceylon are put at 2,100 calories per caput per day for an "average" person and one gram of protein per kilogram of body weight. The figures presently employed are 45 grams total protein, of which 12 should be of animal origin. These figures are intended as rough guides and include a safety factor. In the absence of evidence on activity patterns, a principal determinant of calorie needs, they are probably as reasonable guidelines as presently can be set forth.

CHART 4. CEYLON SOCIO-ECONOMIC SURVEY 1969/70: APPARENT PER CAPITA PROTEIN CONSUMPTION, BY FOOD GROUPS AND INCOME CLASS

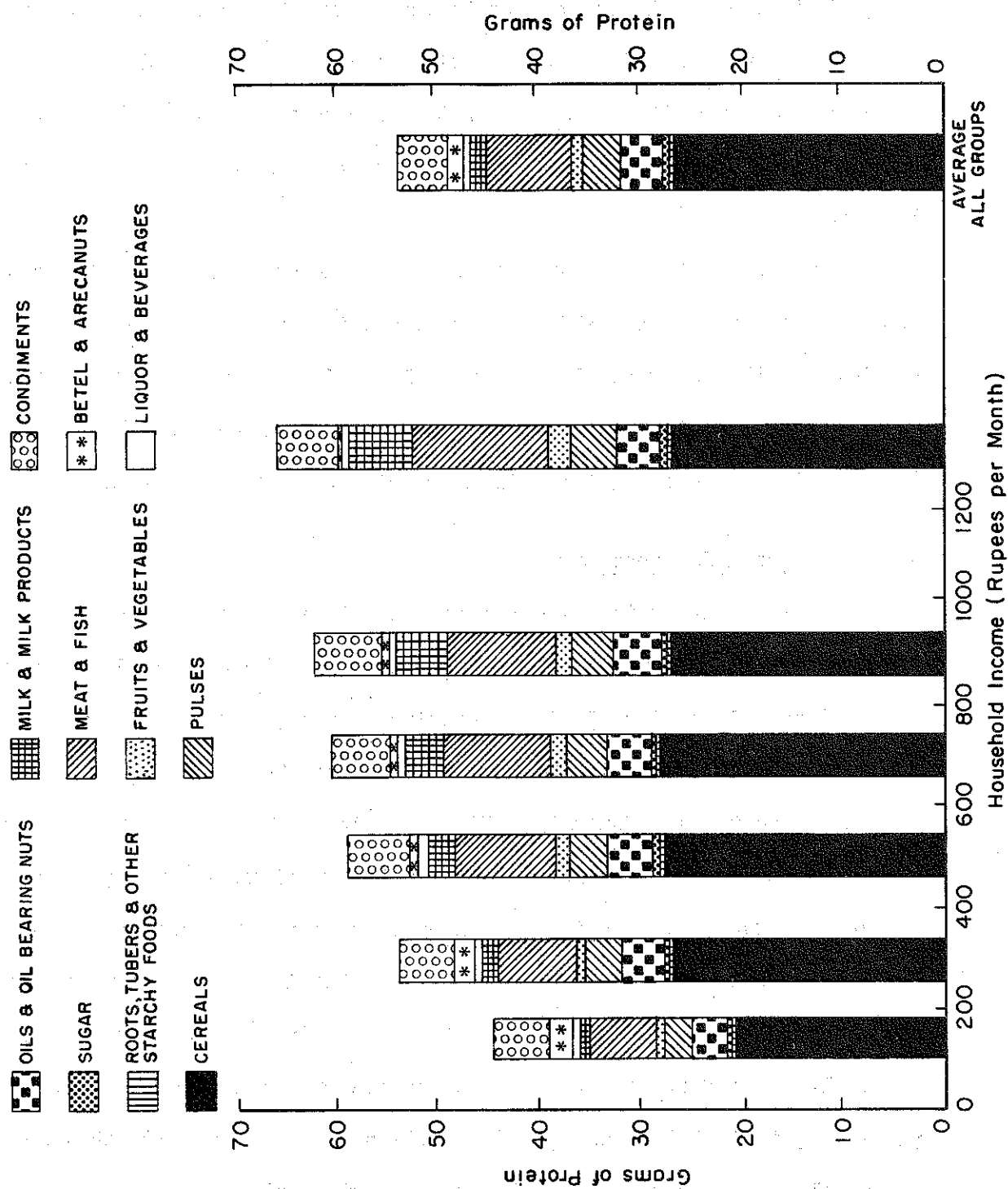
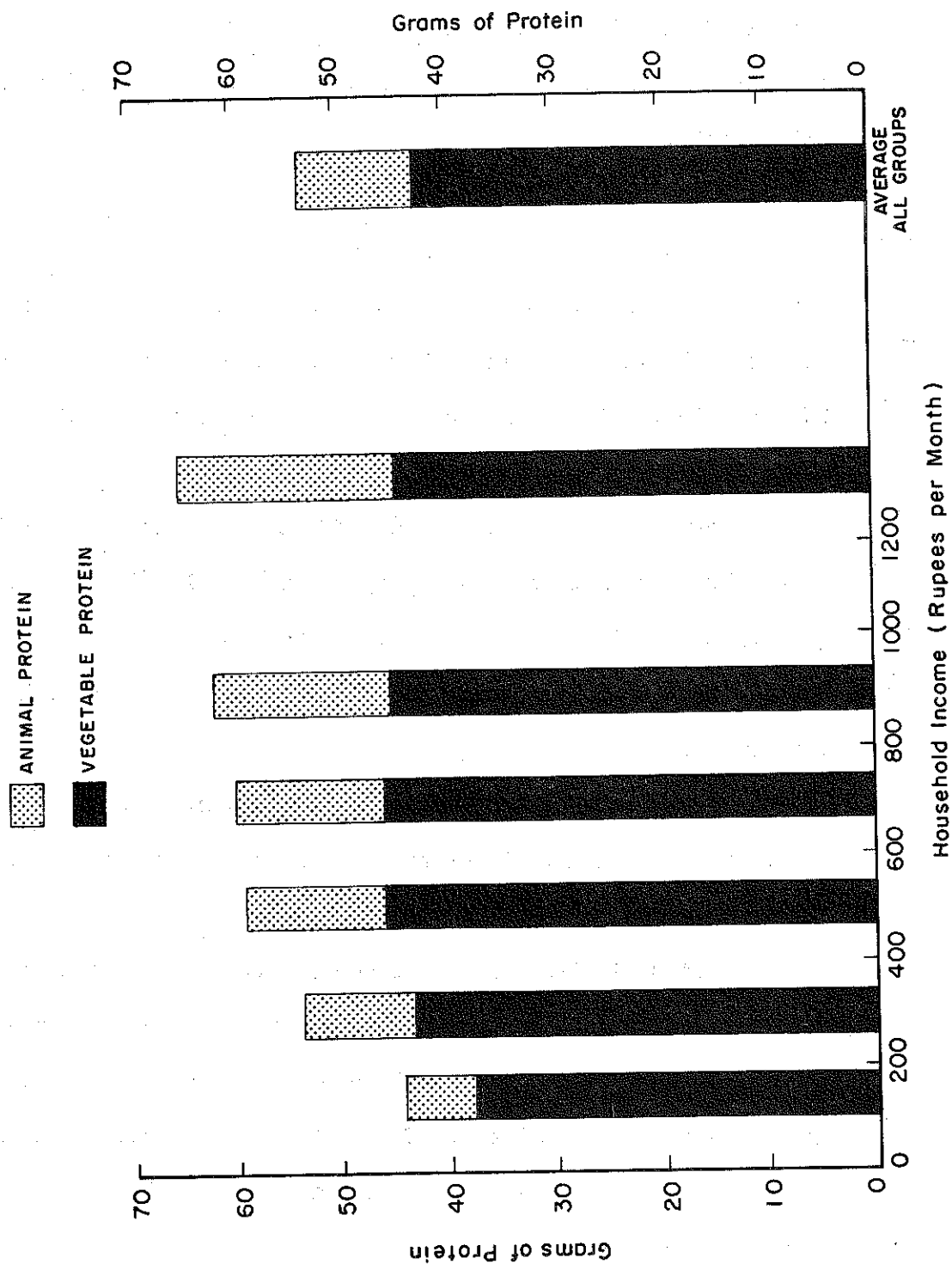


CHART 5. CEYLON SOCIO-ECONOMIC SURVEY 1969/70: APPARENT PER CAPITA DAILY ANIMAL AND VEGETABLE PROTEIN CONSUMPTION, BY INCOME CLASS



By these standards the data would seem to suggest there is no nutritional problem in Ceylon; that the marginally adequate average picture suggested by the food balance sheet does not break down among the poorer inhabitants.

But is this really so?

Between the under Rs.200 and Rs.200-400 income classes a change in diet occurs that is entirely quantitative. The composition of the diet is virtually identical in both groups, but between them there is a gap of 200 calories. Of this, 100 calories is made up of outside ration rice and about 50 calories of sugar.

It could be argued that the difference simply reflects less waste among the poor or perhaps--if they are not employed--lower calorie needs growing out of less active lives. On the other hand it could equally be argued that it implies enforced reduced activity and actual physical deterioration.

As 43 percent of the population fall within the less than Rs.200 group, the question wants urgent answering and two avenues of inquiry are recommended.

The first is that the Department of Census and Statistics breaks down more finely its data for the under Rs.200 income class. This would be comparatively easy to do. In the Estate Sector income could be taken as the distinction, with breakdowns of Rs.100, Rs.125, Rs.150, and Rs.175 recommended. In the Urban and Rural Sectors, occupation might be a more meaningful categorization.

The second line of research relates to the Nutrition Department of the MRI. Work should be initiated to determine the calorie requirements of

occupational groups in the low income classes so that calorie needs can be set with greater confidence. And work is urgently needed on distribution of food within the household.

For the marginally adequate picture conveyed by either the food balance sheet or the survey to be valid, it must be assumed that food is divided proportionately among all members of the household. Apparent adequacy of animal protein would be pure illusion if the bulk of the meat and fish is eaten by the father. The pre-school child is presumed to be the most nutritionally vulnerable person in the country. The Survey tells us nothing about what he eats.

Hitherto the three nutritional surveys the MRI carries out each year have measured only household food consumption. It is recommended that in the future the number of surveys be greatly expanded and that they focus on the question of distribution of food stuffs within the family.

So we end where we began; in ignorance. But one thing is clear. The foremost problem in Ceylon is the unemployment question. Beside it any nutritional problem pales. Give the people jobs and any nutritional problem will take care of itself.

CITATIONS

1. T. Jogaratnam and T. T. Poleman, Food in the Economy of Ceylon, (Cornell International Agricultural Development Bulletin 11, October 1969).

2. Dept. of Census and Statistics, Preliminary Report on the Socio-Economic Survey of Ceylon, 1969-70 (October 1971).

APPENDIX TABLE 1. SOCIO-ECONOMIC SURVEY 1969/70: APPARENT PER CAPITA DAILY NUTRIENT AVAILABILITIES, BY INCOME CLASS AND FOOD GROUP; ALL ISLAND

	Below 200			200 - 399			400 - 599			600 - 799			800 - 999			1,000 and Over			ALL GROUPS		
	Calories	Animal Veg.	Proteins	Calories	Animal Veg.	Proteins	Calories	Animal Veg.	Proteins	Calories	Animal Veg.	Proteins	Calories	Animal Veg.	Proteins	Calories	Animal Veg.	Proteins	Calories	Animal Veg.	
CEREALS																					
Rationed Rice	430.6	-	8.5	424.2	-	8.4	403.4	-	8.0	393.0	-	7.7	368.5	-	6.8	323.4	-	6.1	417.5	-	8.5
Outside Rationed Rice	416.5	-	7.8	515.8	-	9.6	591.4	-	11.0	593.1	-	11.0	617.8	-	11.5	597.8	-	11.1	500.0	-	9.3
Wheat, Flour and Bread	237.6	-	7.5	281.3	-	8.8	280.4	-	8.9	297.9	-	9.5	266.6	-	8.4	314.1	-	9.9	283.7	-	9.0
Other Cereals	32.8	-	0.7	16.4	-	0.4	13.1	-	0.3	16.4	-	0.4	29.5	-	0.7	9.8	-	0.2	19.7	-	0.4
Sub-Total	1,117.5	-	24.5	1,237.7	-	27.2	1,288.3	-	28.2	1,300.4	-	28.6	1,282.4	-	27.4	1,245.1	-	27.3	1,220.9	-	26.9
ROOTS, TUBERS AND OTHER STARCH FOODS																					
SUGAR	37.3	-	0.1	26.1	-	0.2	22.7	-	0.2	18.0	-	0.2	19.7	-	0.1	18.7	-	0.2	29.0	-	0.2
SUGAR	165.7	-	0.1	203.1	-	0.1	238.7	-	0.1	251.9	-	0.1	253.2	-	0.2	272.5	-	0.2	199.9	-	0.1
OILS AND OIL-BEARING FOODS																					
NUTS																					
Coconuts	360.1	-	3.6	377.8	-	3.8	404.0	-	4.1	436.9	-	4.4	432.9	-	4.4	458.7	-	4.6	381.8	-	3.9
Coconut Oil	96.3	-	-	107.1	-	-	120.6	-	-	114.3	-	-	123.3	-	-	141.3	-	-	107.1	-	-
Other Nuts and Oils Including Butter	6.1	-	0.1	9.4	-	0.1	15.8	-	0.1	26.0	-	0.1	38.2	-	0.1	55.3	-	0.1	12.3	-	0.1
Sub-Total	462.5	-	3.7	494.3	-	3.9	540.4	-	4.2	577.2	-	4.5	594.4	-	4.5	655.3	-	4.7	501.2	-	4.0
PULSES	49.7	-	3.7	52.4	-	3.8	54.5	-	4.0	54.6	-	3.9	58.4	-	4.2	60.6	-	4.4	52.4	-	3.8
FRUITS AND VEGETABLES																					
Fruits	4.2	-	0.0	7.3	-	0.0	13.6	-	0.2	17.0	-	0.2	26.0	-	0.3	32.0	-	0.3	8.6	-	0.1
Vegetables	19.4	-	0.8	23.0	-	0.9	27.7	-	1.1	29.7	-	1.2	32.6	-	1.4	36.0	-	1.8	23.1	-	0.9
Sub-Total	23.6	-	0.8	30.3	-	0.9	41.3	-	1.3	46.7	-	1.4	58.6	-	1.7	68.0	-	2.1	31.7	-	1.0
MEAT AND FISH																					
Beef	2.4	0.5	-	4.7	0.9	-	8.7	1.7	-	10.5	2.1	-	11.9	2.4	-	20.3	4.0	-	5.3	1.1	-
Mutton	0.5	0.1	-	0.9	0.2	-	1.2	0.2	-	2.0	0.4	-	2.2	0.4	-	3.5	0.6	-	0.9	0.2	-
Pork	0.7	0.0	-	1.5	0.1	-	4.4	0.2	-	3.7	0.1	-	3.7	0.1	-	3.3	0.1	-	1.0	0.1	-
Poultry	0.0	0.0	-	0.1	0.0	-	0.4	0.1	-	0.8	0.2	-	1.0	0.2	-	3.4	0.8	-	0.3	0.1	-
Fresh Fish	9.6	1.6	-	19.5	3.1	-	26.3	3.9	-	27.5	4.0	-	31.3	4.3	-	39.6	5.5	-	18.1	2.9	-
Dried, Preserved and Canned Fish	21.1	4.2	-	21.8	4.3	-	19.9	3.7	-	17.5	3.6	-	18.9	3.5	-	13.3	2.5	-	20.9	4.1	-
Sub-Total	34.3	6.4	-	48.3	8.6	-	60.9	9.8	-	62.0	10.4	-	69.0	10.9	-	83.4	13.5	-	47.4	8.5	-
MILK AND MILK PRODUCTS (Except Butter)																					
Fresh Milk	7.9	0.4	-	14.7	0.7	-	23.6	1.1	-	30.4	1.4	-	37.1	1.8	-	61.8	3.0	-	16.0	0.8	-
Preserved Milk, etc.	8.8	0.4	-	15.7	0.7	-	21.9	1.0	-	33.4	1.7	-	49.7	2.4	-	39.3	1.9	-	16.1	0.8	-
Eggs	0.9	0.1	-	2.4	0.2	-	5.2	0.4	-	7.4	0.6	-	10.2	0.8	-	16.8	1.3	-	3.1	0.2	-
Sub-Total	17.6	0.9	-	32.8	1.6	-	50.7	2.5	-	71.2	3.7	-	97.0	5.0	-	117.9	6.2	-	35.2	1.7	-
LIQUOR AND BEVERAGES																					
Alcoholic Beverages	10.3	-	0.0	12.4	-	0.0	15.4	-	0.0	15.5	-	0.0	8.6	-	0.0	9.8	-	0.0	12.4	-	0.0
Non-Alcoholic Beverages	1.6	-	0.4	1.9	-	0.4	2.3	-	0.4	2.8	-	0.4	3.7	-	0.4	6.4	-	0.4	2.0	-	0.4
Sub-Total	14.9	-	0.4	14.3	-	0.4	17.7	-	0.4	18.3	-	0.4	12.3	-	0.4	16.2	-	0.4	14.4	-	0.4
BEET AND ARCANUTS	91.6	-	2.1	73.5	-	1.7	56.5	-	1.3	45.5	-	1.6	34.1	-	0.8	23.6	-	0.5	73.7	-	1.7
CONDIMENTS	52.4	0.4	4.3	59.4	0.5	3.1	65.1	0.6	6.0	65.3	0.6	6.0	71.3	0.6	6.4	79.9	1.1	5.6	58.5	0.5	5.0
GRAND TOTAL	2,063.6	7.7	39.7	2,272.2	10.7	43.3	2,436.7	12.9	45.7	2,512.1	14.7	46.1	2,540.4	16.5	45.7	2,641.2	20.8	45.2	2,264.3	10.7	43.1

APPENDIX TABLE 2. SOCIO-ECONOMIC SURVEY 1969/70: APPARENT PER CAPITA DAILY NUTRIENT AVAILABILITIES, BY INCOME CLASS AND FOOD GROUP; URBAN SECTOR

	Below 200			200 - 399			400 - 599			600 - 799			800 - 999			1,000 and Over			ALL GROUPS		
	Proteins		Calories	Proteins		Calories	Proteins		Calories	Proteins		Calories	Proteins		Calories	Proteins		Calories	Proteins		Calories
	Animal	Veg.		Animal	Veg.		Animal	Veg.		Animal	Veg.		Animal	Veg.		Animal	Veg.		Animal	Veg.	
CEREALS																					
Rationed Rice	409.5	-	8.1	419.5	-	8.3	411.6	-	8.1	398.1	-	7.8	401.6	-	7.9	303.6	-	6.0	402.3	-	7.9
Outside Rationed Rice	338.2	-	6.3	396.8	-	7.4	427.9	-	8.0	473.6	-	8.8	489.6	-	9.1	483.4	-	9.0	414.3	-	7.7
Wheat, Flour and Bread	266.1	-	8.4	287.9	-	9.1	301.0	-	9.6	314.4	-	10.0	302.9	-	9.6	346.9	-	11.0	295.8	-	9.4
Other Cereals	16.7	-	0.4	5.6	-	0.1	8.9	-	0.2	7.9	-	0.2	14.4	-	0.3	10.5	-	0.2	9.5	-	0.2
Sub-Total	1,030.5	-	23.2	1,109.8	-	24.9	1,150.4	-	25.9	1,194.0	-	26.8	1,208.5	-	26.9	1,144.4	-	26.9	1,121.9	-	25.2
ROOTS, TUBERS AND OTHER STARCHY FOODS																					
SUGAR	14.2	-	0.1	13.7	-	0.1	14.6	-	0.1	14.9	-	0.1	16.3	-	0.2	16.7	-	0.2	14.4	-	0.1
Sub-Total	181.4	-	0.0	210.0	-	0.0	234.1	-	0.1	241.9	-	0.1	251.5	-	0.1	267.6	-	0.1	221.0	-	0.1
OILS AND OIL-SEARING																					
Nuts	331.2	-	3.4	348.5	-	3.5	374.7	-	3.8	389.8	-	4.0	408.0	-	4.2	414.2	-	4.2	364.1	-	3.7
Coconuts	102.6	-	-	105.3	-	-	118.8	-	-	127.8	-	-	129.6	-	-	145.8	-	-	114.3	-	-
Other Nuts and Oils Including Butter	8.3	-	0.0	13.5	-	0.1	24.9	-	0.1	34.3	-	0.1	48.0	-	0.3	64.3	-	0.1	25.8	-	0.1
Sub-Total	442.1	-	3.4	467.3	-	3.6	518.4	-	3.9	551.9	-	4.1	585.6	-	4.5	624.3	-	4.3	504.2	-	3.8
PULSES	38.4	-	2.9	42.9	-	3.1	49.4	-	3.6	45.3	-	3.3	51.2	-	3.7	51.4	-	3.7	44.5	-	3.2
FRUITS AND VEGETABLES																					
Fruits	3.6	-	0.0	7.8	-	0.0	14.6	-	0.1	19.1	-	0.2	24.7	-	0.3	34.1	-	0.3	13.1	-	0.1
Vegetables	20.2	-	0.9	23.4	-	1.0	26.3	-	1.2	30.1	-	1.5	33.3	-	1.5	35.4	-	1.8	25.6	-	2.6
Sub-Total	23.8	-	0.9	31.2	-	1.0	40.9	-	1.3	49.2	-	1.7	58.0	-	1.8	69.5	-	2.1	38.7	-	2.7
MEAT AND FISH																					
Beef	6.7	1.3	-	8.8	1.7	-	13.8	2.7	-	14.5	2.9	-	16.9	3.3	-	23.5	4.7	-	11.9	2.4	-
Mutton	0.4	0.1	-	0.9	0.2	-	1.3	0.2	-	2.2	0.4	-	3.7	0.7	-	4.2	0.8	-	1.5	0.3	-
Pork	0.0	0.0	-	0.4	0.0	-	0.7	0.0	-	0.7	0.0	-	1.9	0.1	-	5.2	0.2	-	0.7	0.0	-
Poultry	0.1	0.0	-	0.1	0.0	-	0.5	0.1	-	1.1	0.3	-	1.3	0.3	-	4.4	1.0	-	0.8	0.2	-
Fresh Fish	21.7	3.6	-	27.5	4.4	-	34.8	5.1	-	33.8	4.8	-	33.8	4.6	-	41.6	5.6	-	30.4	4.6	-
Dried, Preserved and Canned Fish	15.8	3.1	-	11.9	2.3	-	10.4	1.4	-	11.7	2.2	-	13.9	2.4	-	9.7	1.8	-	11.9	2.3	-
Sub-Total	44.7	8.1	-	49.6	8.6	-	61.5	9.5	-	64.0	10.6	-	71.5	11.4	-	88.6	14.1	-	57.2	9.8	-
MILK AND MILK PRODUCTS																					
(Except Butter)	6.0	0.3	-	12.9	0.6	-	23.2	1.1	-	32.4	1.5	-	38.3	1.8	-	60.2	2.9	-	21.4	1.0	-
Fresh Milk	15.7	0.8	-	23.9	1.1	-	30.4	1.4	-	33.4	1.5	-	55.2	2.7	-	51.8	2.4	-	29.6	1.4	-
Preserved Milk, etc.	0.9	0.1	-	2.8	0.2	-	5.4	0.4	-	8.7	0.7	-	13.0	1.0	-	19.5	1.5	-	5.7	0.4	-
Eggs	22.6	1.2	-	39.6	2.3	-	59.0	2.9	-	74.5	3.7	-	106.5	5.5	-	131.5	6.8	-	56.7	2.8	-
Sub-Total	45.2	2.4	-	79.2	4.6	-	117.6	5.8	-	149.0	7.4	-	213.0	10.0	-	263.0	13.6	-	113.7	5.6	-
LIQUOR AND BEVERAGES																					
Alcoholic Beverages	7.6	-	0.0	22.4	-	-	9.6	-	-	22.8	-	-	9.8	-	-	8.1	-	-	9.7	-	-
Non-Alcoholic Beverages	1.6	-	0.3	1.8	-	0.3	2.5	-	0.3	2.9	-	0.3	3.8	-	0.3	6.9	-	0.4	2.4	-	-
Sub-Total	9.2	-	0.3	24.2	-	0.3	12.0	-	0.3	25.7	-	0.3	13.6	-	0.3	15.0	-	0.4	12.1	-	-
BETEL AND ARECANUTS																					
Sub-Total	35.7	-	0.9	28.7	-	0.6	21.4	-	0.5	18.4	-	0.4	12.6	-	0.3	9.3	-	0.2	24.7	-	0.6
CONDIMENTS																					
Sub-Total	58.9	0.5	2.7	61.1	0.4	3.2	68.7	0.8	3.0	70.9	0.7	3.1	74.8	0.8	3.6	78.0	1.1	3.4	65.8	0.6	3.6
GRAND TOTAL	1,901.5	9.8	34.4	2,467.0	10.9	36.8	2,230.4	13.2	38.7	2,339.7	15.0	39.8	2,450.1	17.7	41.4	2,446.3	22.0	40.6	2,161.2	13.2	39.0

APPENDIX TABLE 3. SOCIO-ECONOMIC SURVEY 1969/70: APPARENT PER CAPITA DAILY NUTRIENT AVAILABILITIES, BY INCOME CLASS AND FOOD GROUP: RURAL SECTOR

	Below 200			200 - 399			400 - 599			600 - 799			800 - 999			1,000 and Over			ALL GROUPS		
	Calories	Animal Veg.	Proteins	Calories	Animal Veg.	Proteins	Calories	Animal Veg.	Proteins	Calories	Animal Veg.	Proteins	Calories	Animal Veg.	Proteins	Calories	Animal Veg.	Proteins	Calories	Animal Veg.	
CEREALS																					
Rationed Rice	430.6	-	8.5	421.6	-	8.3	398.5	-	7.9	390.5	-	7.7	317.1	-	6.2	360.5	-	7.1	417.8	-	8.2
Outside Rationed Rice	433.1	-	8.1	559.4	-	10.4	651.9	-	12.1	649.8	-	12.1	742.0	-	13.8	801.0	-	14.9	535.7	-	10.0
Wheat, Flour and Bread	251.0	-	8.0	263.3	-	8.4	272.2	-	8.6	288.5	-	9.2	232.4	-	7.3	242.8	-	7.7	260.9	-	8.2
Other Cereals	40.7	-	0.9	20.0	-	0.4	16.4	-	0.4	20.3	-	0.5	4.9	-	1.1	1.0	-	0.2	2.6	-	0.6
Sub-Total	1,155.4	-	25.5	1,264.3	-	17.4	1,339.0	-	29.0	1,349.1	-	29.5	1,296.4	-	28.4	1,405.3	-	29.9	1,217.2	-	27.0
ROOTS, TUBERS AND OTHER STARCHY FOODS																					
	44.5	-	0.3	30.9	-	0.2	25.3	-	0.2	21.0	-	0.2	23.1	-	0.2	22.2	-	0.3	34.6	-	0.3
SUGAR	167.3	-	0.1	207.9	-	0.1	242.7	-	0.1	257.5	-	0.1	255.0	-	0.3	277.8	-	0.1	201.4	-	0.1
OILS AND OIL-BEARING NUTS																					
Coconuts	370.7	-	3.8	398.3	-	4.0	374.7	-	3.8	457.8	-	4.6	455.5	-	4.6	537.7	-	5.4	396.4	-	4.0
Cocunut Oil	84.6	-	-	100.8	-	-	116.1	-	-	105.3	-	-	111.6	-	-	136.8	-	-	98.1	-	-
Other Nuts and Oils Including Butter	6.7	-	0.1	8.9	-	0.0	14.1	-	0.1	22.0	-	0.2	26.0	-	0.0	36.9	-	0.1	10.1	-	0.1
Sub-Total	462.0	-	3.9	508.0	-	4.0	504.9	-	3.9	585.1	-	4.8	593.1	-	4.6	711.2	-	5.5	504.6	-	4.1
PULSES	44.2	-	3.6	50.4	-	3.7	54.2	-	4.0	57.8	-	4.2	63.9	-	4.6	76.2	-	5.6	49.4	-	3.6
FRUITS AND VEGETABLES																					
Fruits	4.8	-	0.0	8.3	-	0.1	13.9	-	0.2	16.9	-	0.2	29.6	-	0.4	31.4	-	0.4	8.7	-	0.1
Vegetables	21.0	-	0.8	24.7	-	1.0	28.9	-	1.1	31.4	-	1.2	33.5	-	1.4	39.7	-	1.5	24.7	-	0.9
Sub-Total	25.8	-	0.8	33.0	-	1.1	42.8	-	1.3	48.3	-	1.4	63.1	-	1.8	71.1	-	1.9	33.4	-	1.0
MEAT AND FISH																					
Beef	1.8	0.4	-	3.9	0.8	-	7.1	1.4	-	8.8	1.7	-	7.3	1.4	-	13.3	2.6	-	4.0	0.8	-
Mutton	0.2	0.0	-	0.8	0.1	-	1.1	0.2	-	1.8	0.3	-	0.8	0.1	-	2.4	0.4	-	0.7	0.1	-
Pork	1.5	0.1	-	1.9	0.1	-	5.9	0.2	-	5.2	0.2	-	4.1	0.2	-	0.0	0.0	-	2.2	0.1	-
Poultry	0.0	0.0	-	0.1	0.0	-	0.3	0.1	-	0.4	0.1	-	0.5	0.1	-	1.9	0.4	-	0.1	0.0	-
Fresh Fish	10.0	1.7	-	19.9	3.2	-	24.7	3.7	-	24.7	3.7	-	29.1	4.1	-	35.6	5.3	-	17.3	2.3	-
Dried, Preserved and Canned Fish	19.8	4.0	-	23.3	4.6	-	22.7	4.2	-	21.0	4.1	-	23.4	4.7	-	19.8	3.9	-	21.9	4.3	-
Sub-Total	33.3	6.2	-	49.9	8.8	-	61.8	9.8	-	61.9	10.1	-	65.2	10.6	-	73.0	12.6	-	46.2	8.1	-
MILK AND MILK PRODUCTS (Except Butter)																					
Fresh Milk	4.8	0.2	-	12.5	0.6	-	22.7	1.1	-	29.0	1.4	-	35.6	1.7	-	60.4	2.9	-	112.9	0.6	-
Preserved Milk, etc.	8.0	0.4	-	14.9	0.7	-	18.6	0.9	-	33.5	1.8	-	43.3	2.2	-	15.7	0.8	-	13.9	0.7	-
Eggs	0.7	0.1	-	2.4	0.2	-	5.0	0.4	-	6.7	0.5	-	7.4	0.6	-	11.6	0.9	-	2.6	0.2	-
Sub-Total	13.5	0.7	-	29.8	1.5	-	46.3	2.4	-	69.2	3.7	-	86.3	4.5	-	87.7	4.6	-	29.4	1.5	-
LIQUOR AND BEVERAGES																					
Alcoholic Beverages	9.0	-	0.0	12.1	-	0.0	17.9	-	0.0	16.9	-	0.0	7.8	-	0.0	13.5	-	0.0	12.1	-	0.0
Non-Alcoholic Beverages	1.7	-	0.4	1.9	-	0.4	2.1	-	0.4	2.6	-	0.4	3.6	-	0.4	5.1	-	0.5	1.9	-	0.4
Sub-Total	10.7	-	0.4	14.0	-	0.4	20.0	-	0.4	19.5	-	0.4	11.4	-	0.4	18.6	-	0.5	14.0	-	0.4
BETEL AND ARECANUTS	89.7	-	2.1	78.9	-	1.9	66.8	-	1.5	66.3	-	1.3	54.5	-	1.3	48.7	-	1.1	79.4	-	1.9
CONDIMENTS	52.6	0.4	2.5	59.3	0.4	2.9	63.1	0.5	2.9	62.5	0.5	2.8	70.2	0.5	3.1	96.4	1.0	4.3	58.5	0.5	2.7
GRAND TOTAL	2,099.0	7.3	39.2	2,326.4	10.7	41.8	2,466.9	12.7	43.3	2,598.2	14.3	44.7	2,582.2	15.6	44.7	2,686.8	18.2	49.2	2,268.1	10.1	41.1

