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AVAILABLE DATA ON THE STATE OF FOOD AND
NUTRITION OF THE PEOPLES OF THE COMMONWEALTH CARIBBEAN

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Assessing Undernourishment

Health

If we are overnourished we get fat and if we are undernourished we get thin and undernourished children grow slowly. The state of nutrition of individuals or communities is directly reflected in body size and shape and in growth rates. Severe and specific nutritional deficiencies are manifested in certain clinical signs leading, if the condition persists, to specific diseases, such as marasmus or kwashiorkor, beri-beri or pellagra.

If we are malnourished we function worse - physically, mentally and probably socially. But these effects are difficult to measure in human beings and are not much used in the assessment of nutritional status, or even in the measurement of the consequences of malnutrition.

Death, as far as the individual is concerned, is the ultimate end-result of an inadequate diet. However malnutrition *alone* rarely causes death; it is nearly always precipitated by other conditions, such as infections related to poor hygiene. The reaper, as often as not, is malnutrition but his scythe is gastroenteritis.

The vulnerability of individuals to the effects of an inadequate diet vary with age. The breast fed infant is protected from malnutrition for at least six months. The older infant "*mewling and puking in the nurse's arms*" and the toddler are extremely vulnerable to malnutrition. This is the age in which we find marasmus and these are the children who die from malnutrition. As he gets older the surviving child adapts to his nutritional, hygienic, social and cultural environment. He may not function as well as he might have. He may be frequently absent from school or inattentive when he reaches there but he is unlikely to become seriously sick.

A hardened economist, dedicated by his training to saving society rather than saving life alone may consider different priorities than the paediatrician and the nurse. He may consider the effects of undernourishment on work productivity, earning power and learning power as more significant and serious than death in early childhood. We know that many farmers have a dietary energy intake inadequate to allow them to perform regular farming activity without loss of weight. I don't want to over-argue this point. There is no doubt that if an individual's dietary energy intake is below his requirements his maximum work output is reduced. However, take a cane cutter for example: inefficiencies and breakdowns in the factory may well be the first limitations to productivity rather than his undernourishment. The tragic condition of underdevelopment affects most aspects of life, and a single blinkered approach or simplistic philosophy will only distort development, not facilitate it.

Diet

The requirements of humans for nutrients are known, although not with the precision that, for example, chicken farmers know the optimal nutrient intakes of their flocks. If we humans were bred as layers or broilers, intellectuals or workers, it might be possible to make extremely precise estimates of nutrient requirements but we are not like that; we are troublesome beings of great variety and adaptability. Compare the family of Ganesh Prasad, a merchant in Georgetown, with that of Joe Bone, a peasant farmer from Rockstone Pen in the Mocho Mountains of Jamaica, in terms of the foods they eat, their purchasing power, their aspirations and their requirements.

While we can estimate requirements for *nutrients* it is quite another matter to attempt to specify essential *foods*. Certain guidelines can be given and, if they take into account nutrient requirements, socio-cultural needs and preferences, ecological constraints and economic limitations, they can be very useful.

Available Information in the Commonwealth Caribbean

The Data

Fairly complete information on nutritional status is available for many countries of the Commonwealth Caribbean. National food and nutrition surveys using accepted procedures have been carried out on statistically appropriate samples of the populations of Barbados (1968), Guyana (1971) and St. Lucia (1974). Considerable reliable information is available on a national basis from Trinidad and Tobago (1970, 1972) and Jamaica (1969-70, 1970-71). Useful, but more limited reliable data are available from St. Vincent (1969), Grenada (1972), the Turks and Caicos Islands (1973) and Belise (1973) (figures in brackets refer to dates of surveys, not publication). Mortality data are available from all countries in the area; however, the reliability of such data depends on the accuracy of collection.

Because so many individuals do not receive custodial care for malnutrition (thank goodness, when we consider what this often involves [1,2]) hospital records are of limited value for assessing community prevalences of malnutrition. Another confusing factor is that, because of the close inter-relationship between inadequate diets and poor hygiene, one child may be diagnosed as having or dying from either *marasmus* or alternatively *gastroenteritis* depending on the whim of the attending physician. The two diseases are really usually inseparable.

The State of Nutrition in the Commonwealth Caribbean

Table 1 sets out highlights of the most recent available information on nutritional status in the Commonwealth Caribbean countries (in March 1975).

- The average Commonwealth Caribbean infant mortality rate is almost twice that of North America and the toddler mortality rate (1-4 years) is five times as high. This latter is generally accepted as an index of malnutrition.

- 1.4 in every 100 under-5 year olds is very severely underweight (in Gomez grade III) and in imminent danger of death. A further 12 per cent are very definitely underweight (Gomez grade II) and a further 40 per cent are in a borderline condition (Gomez grade I).
- Anaemia is widespread in under-five year old children and in adult women.
- Average daily per caput nutrient requirements in Caribbean countries are around 2,250 kilocalories (9.4 MJ) and 43 gm protein. These figures are derived from FAO/WHO recommendations and, at least for energy, are not overestimates. They have recently been adopted unaltered by a local committee appointed to look into nutritional requirements of the area. The national food energy supplies vary from being about equal to requirements to providing an *over-supply* of about 30 per cent. Protein supplies are well above requirements.
- Distribution of the available nutrients is however inequitable. High proportions of households, often well over 50 per cent, do not get adequate supplies of food energy. The picture is reflected, but without the same brilliance, by inadequate protein intakes. All the evidence goes to show that the protein gap is a mirage in the desert of total energy deficiency. There is *no* specific protein deficiency. There is no need to increase the proportion of protein in most diets in the area.
- The maldistribution of nutrients has been found to be significantly associated with the maldistribution of wealth and of family dependants, the poor and the large families being the most underfed.
- On a country-by-country basis the dependence on imported foods as major sources of nutrients is striking. A high proportion of these imported nutrients comes from outside the Commonwealth Caribbean.

Clearly some over-supply of nutrients will always be necessary to counteract inevitable maldistribution. The United Kingdom Ministry of Food estimated that, during the 1939-45 War and the post-War period, the supply to the retail outlets should provide about 120 to 125 per cent of estimated requirements of food energy [3]. This figure may supply a useful yardstick for the Caribbean if inequalities of purchasing power are brought within reasonable bounds. It should be noted that in this period in the United Kingdom food rationing was in force ensuring an equitable distribution of food.

It would seem useful in the context of the Caribbean Common Market to consider the problem of reliance on imported foodstuffs on a regional basis, and to construct a regional food balance sheet. This would show the proportions available to the population of food energy and protein that are derived from sources outside the Region. Such an enterprise has not, as far as I am aware, been undertaken. Leslie and Rankine [4] mentioned both regional and national self-sufficiency. A regional food balance sheet would be useful.

The Principal Foods Supplying Nutrients

There are two major ways of measuring national food availability and consumption. The first is a national food balance sheet, derived from yearly estimates of production, imports, diversions to livestock and so on converted to an average daily per caput availability. The other method is a household food consumption survey. Both procedures use a food consumption table to convert the weight of each food to the amounts of various nutrients derived from such food. I should note here that a Food Composition Table for the Contemporary Caribbean is available from CFNI. The composition of almost every significant local food is known. Both methods of estimated food consumption are fraught with difficulties; they do however give acceptable indications (and the best available) of those foods that are important in the diet. Recent food balance sheets and food consumption surveys agree remarkably well in the Commonwealth Caribbean over which are the most important foods and how much they provide.

Table 2 sets out data derived from the most up-to-date food balance sheets. The cereals, and in particular wheat flour and its products provide by far the largest proportion of both total energy and protein of all food groups.

Wheat provides between 17 and 24 per cent of available energy and 18 to 30 per cent of protein from those Commonwealth Caribbean countries for which information is available. Rice provides from under 5 per cent of both energy and protein in St. Lucia to 41 and 30 per cent, respectively, in Guyana.

The foods that make up the diets of various income groups are known for Jamaica. Dark sugar, wheat flour and cooking oil are the major source of dietary energy to the poor. Rice is slightly less important in this respect to the poor but becomes the largest energy supplier to the more affluent half of the population. Wheat flour and rice are also the major suppliers of protein to all but the richest quartile of the Jamaican population. Rice is about half the value as a *good buy* of both energy and protein as is wheat flour (CFNI data). The housewife of whatever income group spends about 8 per cent of her food money on cereals (rather more in Trinidad). Rice does to some extent in Jamaica, replace wheat flour if the housewife can afford it.

The root crops appear in most countries of the area to compare well in price with the cereals on a pound-to-pound basis. However, the housewife is buying about 80 per cent water with her roots and gets much better value for both energy and protein from the basic cereals - cornmeal, counter flour and rice - than the roots. The roots and starchy fruits together contribute between 3 and 17 per cent of energy, and 2 and 11 per cent of protein for the countries of the Commonwealth Caribbean for which information is available (Table 2).

The contribution of the various staple foods of Commonwealth Caribbean dietaries has been discussed recently [5].

General Expenditure on Food

A study of the general picture with regard to food expenditure [6] reveals that the poor spend up to 80 per cent or more of their available

cash on food (and often have to chalk up credit), while the rich may spend as little as 20 per cent - but much more in terms of dollars and cents.

For example, in Guyana in 1971 the poorest half of the households had less than G\$300 per caput per annum to spend; 87 per cent of this went on food. The upper half had over G\$300 and spent on average 44 per cent on food. A similar pattern has been found in Trinidad and Tobago. The poorest quartile of households in St. Lucia spent, in 1974, 61 per cent or more of their money on food, while the richest quartile spent 35 per cent or less. In all these countries undernutrition is primarily a condition of the poor.

Distribution of the Food Dollar

Table 3 shows that the most food money spent by the housewife (even the poor housewife) is on those foodstuffs categoriieed as *animal products*, in particular meat. In strict nutritional terms, the existing diets usually would be just as good if the meat was replaced by a cheaper source of energy; the protein would not be missed, as it is present in excess in the original diet. However, a meal without meat or perhaps meat-tasting substance is thought by most people to be incomplete. Baron of FAO has predicted "*a shift in food demand towards protein-rich foods*" [7]. Can we afford such a shift? Can it be prevented?

The Best Buys for Their Nutrient Content

Knowing the retail cost per pound and the nutrient content of a food, it is possible to calculate the cost of energy, protein and other nutrients in the food. Such calculations of cost nutrient value have been done for most countries of the Region (CFNI unpublished data). The phenomenal price changes of the past few years have not been confined to imported products. Thus, the ranking of cost nutrient values of various foods has not changed very much. A classification in the vaious terririotes in the Commonwealth Caribbean into good, bad and medium buys would be very similar with only minor differences. Starting in January 1975 the Caribbean Food and Nutrition Institute has instituted a regular food price monitoring service in the various territories of the Commonwealth Caribbean. Not only the cost per unit weight but also the cost nutrient values are circulated to interested recipients, ranked according to the cost of energy and protein of the various foodstuffs.

Clearly of the food grown in the Region, sugar, rice (some is imported), the legumes (some are imported), cooking oil and dark green leafy vegetables are all useful providers of nutrients. Of foods imported to the region, wheat flour (and its products), cornmeal, margarine, saltfish and beef (some is produced locally) and dried skim milk stand out. When we compare these lists with the foods widely eaten by the less affluent the wisdom of the impoverished housewife becomes evident. Apart from shortages of supply and from profiteering - over both of which she has little control - and apart from an often very inadequate management of feeding of her young children, the housewife does the best she can. A rational management of food production, importation, marketing and prices can, with education based on realities, help the low-income housewife to feed her family adequately and make mealtime a pleasure. Malnutrition can be eradicated.

Information that can help us achieve this aim is provided, in a somewhat summary form, in this paper. If thereby new questions are raised, that is part of the business of living:

Any question that you can solve is part of a larger question which you can't [8].

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Table 1: Basic nutrition data on the Commonwealth Caribbean.

Country	Population in thousands (1973 estimates)	MORTALITY		NUTRITIONAL STATUS						FOOD INTAKE					
		Infant mortality rate per 1000 live births	1-4 years mortality rate per 1000 in age group	Percentages of children under 5 years old in three grades of low weight according to Gomez scale			Percentages of children under 5 years old in three grades of anaemia			Per caput nutrient availability (from food balance sheet)		% of households not meeting requirements (from food consumption survey)		% of nutrient from imported foods (from food balance sheets)	
				1	2	3	Hb <8.0	Hb 8.0-9.9	Hb 10.0-10.9	Energy (Kcal)	Protein (gm)	Energy	Protein	Energy	Protein
Jamaica	1980	27	4.6	39	9	1.4				2945	74			46	62
Trinidad & Tobago	1060	28	2.1							2431	58	40	31	49	71
Guyana	760	45	5.8	44	17	1.4	1	9	31	2502	63	75	64	34	42
Barbados	241	34	1.3	39	11	1.2	8	15	32	2926	74	58	42	58	76
Bahamas	193	35	1.7												
Belize	132	34	4.1	40	18	1.2									
St. Lucia	114	52	4.1	33	9	1.9	0	8.6	5.7	2244	52	72	30	65	67
Grenada	97	16	1.4	44	10	0	← 38 →								
St. Vincent	92	70	6.2	47	14	1.5									
Antigua	74	19	0.4												
Dominica	74	45	5.9												
St. Kitts, Nevis	65	70	3.6												
Montserrat	13	31	2.9												
Cayman Islands	11	11	-												
Turks & Caicos Is.	6	47	-		<7	0.3									
Commonwealth Caribbean	4912	33	3.9	41	12	1.4				2713	67	56	44		
Northern America		18	0.8	16	0	0									
South America		60	4.2	-	-	-									

Notes: The Jamaican weights are for children under 48 months of age. The Belize Gomez classification is derived from a National sample of 5½ year olds. The Barbados anaemia rate is re-calculated from original data. The Grenada anaemia result refers to fifty 3-4 year olds from one village. The Commonwealth Caribbean figures are means weighted by the population of each country for which data are available.

Table 2: Percentage contributions in various countries of each food group to energy and protein availability and of all individual food items that contribute at least 5% to either energy or protein availability.

	GUYANA (1970)		BARBADOS (1971)		ST. LUCIA (1970)		TRINIDAD AND TOBAGO (1970)		JAMAICA (1972)	
	Energy	Protein	Energy	Protein	Energy	Protein	Energy	Protein	Energy	Protein
<i>Cereal and Cereal Products</i>	59	49	31	30	28	33	40	43	31	38
Wheat products	17	18	19	20	24	30	26	31	22	30
Rice	41	30	10	8			14	12	6	4
<i>Starchy Fruits, Roots and Tubers</i>	6	3	10	7	17	11	3	2	15	10
Tannias					5					
Bananas					5				5	
Yams									5	
<i>Sugars and Syrups</i>	5	0	19	0	13	0	17	0	17	0
Sugar, not refined			16		9)			
Sugar, refined					5)17)		16	
<i>Pulses, Nuts and Oilseeds</i>	4	8	4	9	2	4	4	12	3	4
Dried beans and peas				8				10		
<i>Vegetables</i>	0	0	1	1	0	1	1	1	1	1
<i>Fruits</i>	1	1	2	0	7	3	2	1	3	2
Mangos					6					
<i>Meat and Meat Products</i>	4	10	12	22	10	20	6	14	7	16
Beef and veal				5		5				
Poultry				7		6		7		
<i>Eggs</i>	0	1	0	1	1	2	1	2	1	1
<i>Fish and Fisheries Products</i>	3	12	2	12	2	14	1	7	3	14
Fish, fresh, chilled or frozen			7				7			
Codfish, salted							5			
Canned fish										6
<i>Milk and Milk Products</i>	7	14	7	17	4	10	6	15	7	12
Milk, evaporated			6							
Milk, full fat powder								5		
<i>Oils and Fats</i>	7	0	7	0	11	0	17	0	11	0
Coconut oil					6		10		7	
<i>Miscellaneous</i>	0	1	0	0	1	2	1	2	0	0
<i>Alcoholic Beverages</i>	3	0	5	0	3	0	3	0	1	0
<i>Grand Total (per caput per day)</i>	2502kcal	63gm	2926kcal	74gm	2244kcal	52gm	2431kcal	60gm	2945kcal	74gm

Notes: The figures which are rounded to the nearest whole number are derived from food balance sheets.

Table 3. The percentages of the 'food dollar' that are spent on each food group.

	TRINIDAD & TOBAGO (1970)		JAMAICA (1971/2)					
	Grouped by household income per annum for households of 4 persons and more							
	Rural	Urban	Under J\$2000 Rural	Under J\$2000 Urban Kingston	J\$2000-3999 Rural	J\$2000-3999 Urban Kingston	J\$4000 & over Rural	J\$4000 & over Urban Kingston
Cereals and cereal products	16	13	8	8	8	9	7	9
Starchy fruits, roots and tubers	6	4	9	5	7	4	7	4
Sugars and syrups	3	3	2	3	3	3	3	2
Pulses, nuts and oilseeds	4	3	3	2	4	2	3	3
Vegetables	9	9	6	5	6	5	5	5
Fruits	4	5	3	3	2	2	2	2
Meat and meat products	18	25	33	33	31	34	34	34
Eggs	4	4	1	1	2	2	2	2
Fish and fisheries products	8	5	13	12	14	12	13	12
Milk and milk products	12	13	9	13	9	12	10	12
Oils and fats	7	8	3	3	3	3	3	3
Miscellaneous	8	8	6	7	6	7	7	7
Alcoholic beverages	not included in calculations		4	5	5	5	4	6
Total weekly household expenditure on foods	T\$22	T\$36	J\$23	J\$24	J\$29.43	J\$31	J\$40	J\$39

Note: Data derived from food consumption/household budget surveys.