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THE LEVEL OF NUTRITION IN KERALA

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# THE LEVEL OF NUTRITION IN KERALA\*

## I. Introduction

A considerable proportion of the Indian Population is generally believed to suffer from undernutrition and malnutrition. The proportion of India's population falling below the minimum level of nutrition is anybody's guess; an attempt to derive such proportion from the available data is beset with a host of conceptual and statistical problems. Granting that the significant proportion of the population do not get sufficient calories, proteins, etc., is it because there is not enough to go round or is it because the available supplies are unequally distributed?

In this paper we shall attempt to make an assessment of the nutrition status of the people in Kerala. A study of the availability and intake of food may indicate broadly the extent to which undernutrition and malnutrition are due to underproduction or maldistribution or both. Though the analysis is with special reference to Kerala, we hope that the conclusions emerging from this study will have wider applications.

## II. Assessment of Nutrition Status - Methodological Problems.

Recent attempts at assessing nutrition levels and estimating the proportion of the population suffering from nutritional inadequacy are based on consumer expenditure data. Thus for instance, Dandekar and Rath have, on the basis of the National Sample Survey data, estimated that about one-third of the rural population and about one-half of the urban population live on a diet which is inadequate even in respect of calories.<sup>1</sup>

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\* The Author has benefitted greatly from the comments by Professor K.N.Raj and Professor I.S.Gulati on an earlier Draft. The author alone is responsible for the errors which remain.

<sup>1</sup> V.K.Dandekar and Nilakanta Rath, Poverty in India, Indian School of Political Economy, 1971, See also: P.D.Ojha, A Configuration of Indian Poverty, Challenge of Poverty in India, ed. A.J.Fonseca, Vikas Publications, 1971.

Consumer expenditure data are obviously not suitable for estimating food intake, as there is likely to be a wide margin of reporting error in the quantities of food items consumed in the sample households. An assessment of nutrition status requires more accurate and reliable information. The Food and Agriculture Organisation of the United Nations (F.A.O.) has recommended two methods, the direct method of Food consumption Surveys and the indirect method of Food Balance Sheet, to assess food intake and nutrition status of a population.<sup>2</sup> We attempt here an assessment of food consumption and nutrition level in Kerala in recent years by using both these methods. Before we proceed to do that let us consider some of the methodological issues involved.

The assessment of nutrition status of a population requires two types of information: (a) norms of nutritional need, and (b) estimate of the intake of different nutrients. Both these are generally difficult to obtain in sufficient detail and precision even in developed countries. The information gap is wider in the case of developing countries.

(a) Nutritional needs are governed by a host of variables like a person's age, sex, body weight, occupation, intensity of work, type and level of leisure activities and so on.

Townsend observes:

"There are real difficulties in estimating nutritional needs. The nutritionists have not subtly broken up the the different needs of individuals; they have made overall estimates. These estimates are not even based on studies of the intake of persons in different occupations. Beyond a certain minimum (some where, perhaps, between 1000 and 1500 (Calories), the number of calories a man needs .....depends upon the society in which he lives. Even his dietary needs depend upon climate, the kind of housing he lives in, the kind of job he has, and kind of leisure activities he follows. In other words, estimates of need, even nutritional needs, cannot be absolute; they must be relative to the kind of society in which a man is living".<sup>3</sup>

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<sup>2</sup> Food and Agriculture Organisation of the United Nations, Manual on Food and Nutrition Policy, Rome, 1969.

<sup>3</sup> Townsend, P. "The Scale of Meaning of Poverty in Contemporary Western Society", Dependency and Poverty, 1963-64, Colloquium Series Paper, Brandeis University, quoted by Martin Rein, "The Role of the State in the Distribution and Management of Resources", p. 11.

Information about the determinants of nutritional needs is woefully inadequate in underdeveloped countries like us.

"Since physical stature which determines surface area is a major determinant of energy and other requirements, it is clear that we cannot arrive at a satisfactory formulation of dietary allowances without norms on heights and weights of different age groups. No research norms seem to be available for this country . . . . ."

Even less is known about the other determinants of dietary needs of different individuals or age groups. The Indian Council of Medical Research (I.C.M.R.) has placed the average per capita requirement of calories at 2400 and protein at 46 grams per day for India.<sup>5</sup> On the basis of M.C. and T.C. allowances for different age groups and 1961 Census data, Sukhatme has worked out the per caput calorie requirement for India which comes to 2100 per day at the physiological level and 2250 to 2300 per day at the retail level.<sup>6</sup> The above estimates are for the country as a whole. But there are significant interregional variations in the factors affecting calorie requirement arising from differences in climate, body build, type and level of activity, etc. In this connection, it may be noted that the per caput calorie requirement for Ceylon - which is climatically and otherwise similar to Kerala, but has a higher per caput income - has been estimated at 1930 per day at the physiological level.<sup>7</sup> Incidentally it may be

4. R. Rajalakshmi, and C.V. Ramakrishnan "Dietary Nutritional Allowances for Indians", P.F.Ds. Hum. Nutr. Vol. I. P. 166.

5. National Institute of Nutrition, C. Gopalak, Et. al., Diet Atlas of India, Indian Council of Medical Research, Hyderabad, 1969, Pp. 40, 42.

6. F.V. Sukhatme, Feeding India's Growing Millions, Asia Publishing House, 1965, pp. 20-23.

7. Thenkapillai Jogaratnam and Thomas T. Poleman, Food in the Economy of Ceylon, Cornell International Agricultural Development Bulletin, 11, October 1969, P. 32.

noted that the per caput intake of calories in Japan was only 1989 at the beginning of the Fifties and 2275 by the end of that decade.<sup>8</sup> As for fat, the daily intake needed is believed to be in the range of 45 to 60 grams.

(b) The actual intake of food and their nutritive values are equally difficult to estimate. One source of this information is food balance sheets; but food balance sheets show only the average availability of different foodstuffs for any country or territory. Results of food consumption surveys show the intake of food by the units surveyed which usually consist of households. But the actual intake by individual members in a family is difficult to assess, and, the pattern of food consumption in a family may not correspond to the nutritional requirements of individual members. The estimation of nutrient values is also liable to considerable margin of error. They depend on a number of factors like <sup>the</sup> condition of the food, its processing, cooking, wastage, etc., which cannot be assessed accurately.

### III. Food Balance Sheet

"Food Balance Sheets show for a country for a specified period the flow of food from production, adjusted for trade, to supplies available for human consumption, taking into account changes in stocks, quantities used for animal feed, seed, manufacture and the amounts lost during distribution up to the retail level. They also show the supplies as well as their nutrient values expressed in terms of calories and some nutrients at the retail level."<sup>9</sup>

A national average of per capita intake of food and nutrients is only a rough approximation and is apt to obscure interregional variations in production, distribution and utilization. Regional food balance sheets would be closer to reality.

8. Kazhushi Okkawa and Nobukiyo Takamatzu, Report of the Survey Of Japanese Experiences of Changes in Food Habits in Relation to production pattern, Asian Productivity Organisation, 1971



However, preparation of a regional food balance sheet is a more difficult task and poses serious statistical problems, especially in a developing country. For instance, a region within a country is more "open", while data on inter-regional flows of commodities are not readily available in such a country.

The summary results of the food balance sheet of Kerala are presented below. The food balance sheet is based on data contained in several publications of the State Planning Board, Bureau of Economics and Statistics of the Government of Kerala. The coverage and accuracy of the data leave very much to be desired. Calories, Proteins, and fat of different food items are estimated with the help of the food composition tables given in I.C.M.R.'s Nutritive Value of Indian Foods and the Planning of Satisfactory Diets. The assumptions used here are similar to those underlying the food balance sheet of India, 1961-62, published by the Food and Agriculture Organisation. The reference period of the following estimates is the mid-sixties, representing a three-year average from 1963-64 through 1965-66. The net availability of different food items and their nutritive values are presented in Table I.<sup>10</sup>

The total energy value of the above works out to a little over 2192 calories per caput, per day. The intake of proteins and fat come to about 41 grams and 60 grams respectively. It may, however, be noted that the above food balance sheet of Kerala has

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For details regarding data, assumptions and estimation procedures, see P.G.K. Panikar, Food Balance Sheet of Kerala, Working Paper No.6, Centre for Development Studies, October 1972 (Mimeographed).

several important omissions. For want of data on production we have omitted items like duck egg and meat, inland fish, green leafy vegetables, other vegetables, certain root crops like yam, colocasia, etc., Local consumption of a number of food items is largely dependent on imports from other States in

India, but no accurate and reliable data are available on their imports. Potato, oilseeds like groundnuts, vegetable oil like Vanaspati, certain fruits like oranges, apples, grapes and pulses, etc., belong to this category. Our estimate of meat does not take into account animals slaughtered outside the licensed slaughter houses. When allowance is made for these omissions per caput availability of calories and proteins would go up significantly and would most probably be atleast as high as the requisite minimum.

#### IV. Food Consumption Surveys

Food balance sheets being an indirect method can only give an indication of the food supplies which are presumed to have gone into human consumption. "Moreover, the estimates refer to annual supplies and, therefore, cannot provide information on seasonal variations. A further limitation is that they relate to the country or territory as a whole and so conceal regional differences, and of course, differences which may exist among socio-economic, occupation, age and sex groups."<sup>11</sup>

Food consumption surveys are a more direct method of assessing food intake and nutrition status. Food consumption surveys provide information on different aspects of food consumption from a sample of units such as households or individuals selected

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11. Manual on Food and Nutrition Policy, op.cit, P.15

TABLE I  
FOOD BALANCE SHEET, KENYA

COMMODITY	Net Food (Tonnes)	PER CAPITA CONSUMPTION				
		Kilogram per year	Grams per day	Calories per day	Proteins per day (gm.)	
					Fat per day	
Bananas and other Plaintains	2310 1	15.21	41.67	45.33	0.45	0.04
Kangoes	5239 0	20.27	77.45	39.50	0.46	0.77
Jackfruit	4342 1	23.43	64.13	56.47	1.22	0.05
Pineapple	517 7	2.79	7.65	3.51	0.03	0.01
Papaya	297 5	1.60	4.39	1.40	0.02	0.01
<b>Total</b>			<b>195.34</b>	<b>144.21</b>	<b>2.19</b>	<b>0.09</b>
Pork, Buffalo, Beef	1039	0.90	2.43	2.82	0.55	0.00
Poultry meat		0.01	0.03	0.03	0.01	0.00
<b>Total</b>			<b>2.51</b>	<b>2.91</b>	<b>0.56</b>	<b>0.00</b>
Hen eggs	13135	0.71	1.94	3.35	0.26	0.26
	291900	15.00	43.29	41.56	7.90	0.75
Cow Milk	156133	2.43	23.10	15.43	0.70	0.20
Buffalo Milk	43237	2.59	7.10	3.03	0.11	0.20
Goat Milk	10474	0.36	2.43	0.63	0.02	0.03
<b>Total</b>			<b>32.50</b>	<b>19.14</b>	<b>0.63</b>	<b>1.13</b>
<u>nd Fats</u>						
Coconut Oil	143341	4.73	12.95	15.56	0.00	12.96
Sesame Oil	953	0.38	0.14	1.25	0.00	0.14
<b>Total</b>			<b>13.10</b>	<b>117.91</b>	<b>0.00</b>	<b>13.10</b>
<b>BRAND TOTAL</b>			<b>2152.26</b>	<b>40:99</b>	<b>50:21</b>	



Population: 164.78 lakhs

TABLE I  
FOOD BALANCE SHEET, KERALA

3 Year average 1953/54 to 1965/66.

Commodity	Net Food (Tonnes)	Per Capita Consumption				Fat per day
		Kilogram per year	Gram per day	Calories per day	Proteins per day	
<b>Cereals</b>						
Rice	1638563	91.38	250.35	866.00	18.78	2.50
Wheat	164804	10.00	27.40	94.66	3.23	0.40
Jowar	479	0.03	0.08	0.23	0.01	negligible
Ragi	6539	0.34	0.94	3.08	0.07	do-
Other cereals & millets	2854	1.15	0.41	1.35	0.04	0.01
<b>Total</b>			<u>279.13</u>	<u>965.61</u>	<u>22.13</u>	<u>2.92</u>
<b>Starchy Food</b>						
Sweet Potato	35295	1.90	5.23	6.79	0.06	0.02
Yam/oca	1397122	75.61	207.15	325.23	1.45	0.41
<b>Total</b>			<u>212.38</u>	<u>332.01</u>	<u>1.51</u>	<u>0.35</u>
<b>Sugar</b>						
			25.19	100.26		
<b>Pulses, nuts and oil seeds</b>						
Pulses	60832	3.62	10.00	34.00	1.24	0.21
Coconuts	655200	35.46	97.15	431.35	4.37	40.41
<b>Total</b>			<u>107.16</u>	<u>465.35</u>	<u>5.61</u>	<u>40.62</u>

from the general population or different sections of the population.

"The term 'food consumption survey' should refer preferably to surveys in which special attention is paid to the collection of information on quantities of food consumed, at a specified level such as retail level, as it enters the kitchen or is used for the preparation of meals, and in sufficient detail to permit the calculation of the nutritive value of the diet."<sup>12</sup>

(a) In Kerala a number of diet surveys were carried out over the years. The results of some recent rounds, 1965 through 1968, are presented below.<sup>13</sup> Before we proceed to examine these results, we will consider the sampling design and coverage, mode of enquiry, and socio-economic characteristics of the sample households.

The diet survey in 1965 was confined to the monozite belt of Trivandrum District. A total of 220 families, 20 each from 11 sample villages, were covered by the survey. The 1966 survey covered the districts of Alleppy, Calicut, Cannanore, Ernakulam, Kottayam, Palghat and Quilon. In all 796 families were surveyed. The 1968 survey was extended to 14 Applied Nutrition Programme (ANP) Blocks, distributed over all the districts in the State. A major limitation of the recent rounds of the diet survey in Kerala is that the sample consists exclusively of rural households. The mode of the survey, as recommended by the I.C.M.R. consisted of weighing raw foods. The meals taken outside the home by members of the selected families are apt to be partially or fully omitted by the survey. It is a common

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12. Programme of food consumption surveys, op.cit.P.9.

13. Nutrition Research Laboratories. Report on Nutrition Work Done in States in 1965, 1966, and 1967, Indian Council of Medical Research, Hyderabad, Annual Report on Nutrition Activities carried out in the States and Union Territories for the year 1968, Directorate General of Health Services, New Delhi, (Mimeographed); Report on the Baseline Dietary Survey and Nutrition Survey conducted in ANP Blocks, Public Health Laboratory, Government of Kerala, (Unpublished).

practice, especially among the working class families, that the earning members take one or two meals a day from restaurants near their homes or places of work. The omission of this item is bound to materially affect the estimate of the intake of food and nutrients. The Field Assistants visited the sample households during three consecutive days to collect the data of food intake. The weighing technique has been meeting with increasing resistance from the respondents, especially from the upper strata of households, and in such cases the interview method is adopted.

A good proportion of the families included in the samples of successive rounds of the diet surveys conducted in Kerala belonged to the low-income occupational groups. Thus, for instance, of the 220 sample households covered by the diet survey in 1965, 118 were fishermen families and 34 were labour families. Of the 796 households surveyed in 1966, about one-half belonged to the labour class. The 1967 diet survey covered 695 families; of these, 348 belonged to the labour class. In 1968, the diet survey was extended to 1,400 families; of these more than one half, 725 families consisted of labour class households.

The average income of the sample families, as reported in diet surveys, is found to be low, very much lower than the estimated state average. The average income of all sample families in 1965 works out to about Rs. 21.00 per month. The average size of a sample family being 7.5, the annual income per person among the sample families comes to about Rs. 190, as against the estimated state income per capita of Rs. 216.9 during 1965-66. The average income per person even among the highest income group of families, Rs. 220 and above per month, came to only Rs. 7.60 per year, which was lower than the regional income per capita. The

average monthly income per family among the households surveyed during 1966 is reckoned at Rs.109. Given the average size of the family as 5.9, the annual income per person among the sample families would be Rs.218; the per capita income in Kerala in 1966-67 is estimated at Rs.446.57. The monthly income of the sample households covered in 1967 is given as Rs.126, on the average, and the average family size as 7.1. This gives an annual income of Rs.216 per person while the State income per capita for 1967-68 comes to Rs.327.66.. The average income per family among the 1968 sample comes to Rs.108 and the average size of families is seven. On this basis, the average income per person would work out to a little over Rs.185, per year, as against the estimated state income per capita for 1968-69 of Rs.525.96.

True, the average income per caput does not tell the whole story, given the inequalities in the distribution of income and wealth. Unfortunately, no estimate of the distribution of income and wealth in Kerala is available now.\* However, the results of the National Sample Survey on consumer expenditure would shed some light on the pattern of income distribution. The distribution of the rural population, as of 1964-65, according to the level of monthly per caput consumer expenditure is presented

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\* Presently Professor T.H.Krishnan and Mr.M.Subraman Nair at the Centre for Development Studies are engaged in working out the distribution of income and wealth in Kerala.

in Table 2.

Table 2: Percentage Distribution of Rural Population of Kerala According to Monthly per-caput consumer Expenditure.

Expenditure Class. (Rs.)	Yearly Per Caput Expenditure (Rs.)	Percent of rural population.	Cumulative percentage.
0 - 8	73.80	6.48	6.48
8 - 11	115.44	11.8	18.36
11 - 15	144.48	8.4	26.80
13 - 15	168.84	7.44	36.24
15 - 18	198.60	14.20	50.44
18 - 21	229.44	10.38	60.82
21 - 24	270.12	8.50	69.32
24 - 28	310.92	8.61	77.93
28 - 34	368.28	6.95	84.88
34 - 43	458.28	6.48	91.36
43 - 55	582.96	4.18	95.54
55 - 75	728.04	2.91	98.45
<b>75 and above</b>	<b>1195.32</b>	<b>1.55</b>	<b>100.00</b>

Source: The national Sample Survey, Nineteenth Round, July 1964 - June 1965, Number 179, Tables with Notes on Consumer Expenditure, Cabinet Secretariat, Government of India, New Delhi, 1971, Table 1.3.0. pp.19-21. The yearly per caput expenditure is derived from the monthly average for each class given in the Table 1.3.0.

It may be noted that nearly 50 per cent of the rural population in Kerala reported an annual per capita consumer expenditure of Rs.198.60 or more during 1964-65. The average income per caput among the sample families covered by the diet surveys in 1965, 1966, 1967 and 1968 come to Rs.190, Rs.210, Rs.216 and Rs.185 respectively. From the above we may presume that the diet survey sample consisted

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predominantly of low-income families in the State. We should, however, make some allowances for under-reporting of income, especially since the investigators adopted a rough and ready method of obtaining information on income without any deliberate probing and cross checking. Notwithstanding the above, the sample seems to be heavily weighted in favour of low-income families.

(b). The intake of food among the sample families surveyed in Kerala is summarised in Table 3.

Table 3: Average Intake of Foodstuffs

(Grams per caput)

Foodstuff	1965	1966	1967	1968	I.C.M.R. Expert Committee Reco- mmendations(1968)
Rice	216.8	363.2	264.0	237.4	
Wheat	81.1	33.2	76.0	78.3	
Milletts & other cereals. ....		20.9	....	.....	
Total cereals	297.8	417.3	340.0	315.7	400.01
Pulses and legumes	6.8	30.2	14.0	33.1	85.00
Leafy vegetables	0.9	7.0	5.0	8.7	114.00
Other vegetables*	165.6	191.9	172.5	224.1	170.00
Fruit	12.8	30.6	33.0	53.5	35.00
Milk and milk products	36.3	66.9	43.0	48.3	284.00
Flesh foods	88.8	40.0	37.3	44.3	125.00
Fats and oils	3.4	7.4	8.6	44.3**	0.00
Sugar and Jaggery	12.8	21.5	22.9	21.3	57.00
Spices and others	49.5	14.9	14.3	15.1	.....

Source: Report of Nutrition Work Done in States, 1965, 1966 and 1967 op.cit;  
Annual Report on Nutrition Activities carried out in the States and  
Union Territories for the year 1968, op.cit.

\* Includes roots and tubers

\*\* Includes oilnuts.

THE diet is seen to be dominated by cereals and starchy roots, especially rice and tapioca. However, even in the case of cereals there is a substantial deficiency in terms of the minimum recommended by the I.C.M.R. But this gap is to some extent compensated by the intake of tapioca included in the category of "other vegetables". The average intake of protective foods such as pulses and legumes, leafy vegetables, and milk and milk products falls far short of the recommended allowances. The intake of flesh food also leaves much to be desired. However, the low-income bias of the sample and the omission of food taken outside the homes by members of the sample families may be borne in mind in this connection. Further, as pointed out elsewhere, the balanced diet proposed by the I.C.M.R. is unrealistic and ambitious; nor are the recommendations based on the most economical sources of different nutrients.<sup>14</sup>

The nutrient values of food intake listed above are given in Table 4.

Table 4: Average Intake of Nutrients, Per Caput

Nutrients	1965	1966	1967	1968	I.C.M.R. Expert Committee Recommendations (1968)
Calories	1683	2167	1833	1970	2400-3900
Protein (gm.)					
Animal	20.5	10.2	9.3	9.5	
Vegetable	29.9	43.6	35.7	39.4	
Total	50.4	53.8	45.0	48.9	44-55
Fats (gm.)	24.8	24.3	26.0	30.3	
Calcium (mg.)	282	330	360	410	1000
Phosphorus (mg.)	1163	1430	1090	1080	
Iron (mg.)	17	21	18	21	20-30
Vitamin A (I.V.)	326	1230	1334	1747	3000-4000
Thiamin (mg.)	1.1	1.5	1.4	1.5	1.0-2.0
Riboflavin (mg.)	0.3	0.5	0.7	0.6	
Nicotinic Acid (mg.)	14.7	18.9	18.3	17.1	1.0-19.0
Vitamin C (mg.)	12	15	25	32	

Source: Ibid.

14. P.G.K. Panikar, Economics of Nutrition, Economic and Political Weekly, Annual Number, 1971.

It may be noted that the normal intake of protein, iron, thiamine, and nicotinic acid is as high as the recommended allowances. Deficiency is mostly present in respect of calories and Vitamin A. Perhaps, when allowance is made for the defects in sampling and enumeration, the average intake of calories for the population as a whole should be as high as the required minimum.

(c) The foregoing analysis of food balance sheet and food consumption survey data for Kerala suggest that, on the average, the per caput availability and intake of food in the State are just about sufficient to meet the minimum nutritional requirements of all. It goes without saying that if the overall availability and intake are just as high as the recommended allowances, there is apt to be undernourishment and malnourishment among certain sections of the population. The extent of hunger in such an economy would depend upon the degree of inequality in the distribution of income, wealth and consumer expenditure in the community, although the degree of inequality in the intake of food is generally observed to be less than the inequality in the distribution of consumer expenditure, income and wealth. So that as it may, we shall examine some of the available data on the pattern of food intake among different income groups.

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Table 5: Food Consumption in Sample Households  
Of Different Income Groups. (1968)

Commodity	Per Capita Income per Month (Rs.)				Desireable intake (gm.) NAC Allowance (gm.)
	Below 20	20-40	40-80	Above 80	
	Grams per CU)				
Rice	174.1	229.1	299.3	437.4	
Wheat	32.4	97.6	103.6	94.0	
Total cereals	156.5	326.7	403.2	531.4	400
Pulses/legumes	14.6	23.7	46.9	75.9	85.0
Leafy vegetables	6.4	6.0	11.1	21.6	114.0
Roots and tubers	245.4	202.4	178.6	142.8	.....
Other vegetables	58.4	76.4	104.6	108.9	170.0
Fruits.	10.9	27.7	73.5	139.1	85.0
Vegetable oil and oil nuts	15.4	37.4	55.5	92.3	57.0*
Milk and milk products	9.7	20.9	50.8	132.2	204.0
Flesh foods	37.9	46.4	65.0	78.1	125.0
Sugar and Jaggery	16.3	18.8	26.0	38.5	57.0
Condiments	13.3	12.9	12.9	24.0	-----

Source: Annual Report on Nutrition Activities., op.cit.

\* Includes oil nuts.

The above table brings out many significant points on the dietary patterns of families belonging to different income groups. First, the average intake of food by members of the lowest income group of families is inadequate in quantity and poor in quality. The diet of this class is dominated by cereals and starchy roots with very little of protective foods like legumes, fruits, milk, etc. Second, the intake of food varies directly with income, and naturally so; as the income rises, both the quantity and quality of the diet improve. There is considerable inequality in the distribution of most food items; this is especially so with regard to rice, pulses, flesh foods, fruits milk and milk products.

The estimated nutrient values of the food intake among different income groups are given in Table 6.

Table 6: Intake of Nutrient per Consumption Unit  
Among Different Income Groups.  
(1968)

Nutrients	Monthly Income per capita			
	Below Rs.20	Rs.20-40	Rs.40-80	Rs.80 & above
Calories	1528	1956	2517	3455
Proteins (gm.)	37.4	48.7	56.8	91.0
Calcium (mg.)	468.7	656.5	920.9	1385.3
Iron (mg.)	20.8	16.0	34.5	47.4
Vitamin A (I.V.)	907.4	985.9	1694.3	3145.4
Thiamine (Mg.)	1.0	1.3	1.8	2.4
Riboflavin (mg.)	0.6	0.8	1.0	1.4
Nicotinic Acid (mg.)	13.3	16.6	21.3	29.0
Vitamin C (mg.)	98.5	97.7	114.5	124.5

It is seen that the daily intake of calories, proteins, and other nutrients is totally inadequate among persons of the lowest income class. Undernourishment and malnourishment are prevalent to some extent in the next income group also viz., families where per capita income ranges from Rs.20 to Rs.40. The nutrition status is seen to improve steadily thereafter. The intake of calories and protein seems to attain the desirable minimum within the monthly per capita income range of Rs.40-80. The nutrition status of the top income class is quite comfortable.

The results of the diet survey bring into bold relief the fact that there are considerable inequalities in the distribution of food consumption among families belonging to the different income groups and as a consequence the extent of undernourishment and malnutrition is severe among the low-income groups who constitute a sizeable proportion of the State's Population.

## SUMMARY AND CONCLUSIONS

The foregoing attempt at estimating the availability and intake of food in Kerala on the basis of the food balance sheet and results of diet surveys carried out in the State in the sixties bring out the following facts: (i) The overall availability and intake of food are just about sufficient to provide on the average the required minimum of calories, proteins and other essential nutrients. (ii) The typical diet is unbalanced, characterised by the predominance of cereals and tubers on the one hand, and inadequacy of protective food items such as leafy and other vegetables, pulses, eggs, meat milk and milk products, etc., on the other, (iii) The distribution of available food, as is to be expected, is unequal. (iv) Given the fact that the average per caput availability intake is just the bare minimum, and that there is considerable inequality in its distribution, there is apt to be severe undernutrition and malnutrition among certain sections of the population, though due to some serious lacunae in the available data arising from defects in the techniques of sampling and enumeration it is not possible to estimate the extent of hunger in Kerala. However, there is evidence to show that the problem of undernutrition and malnutrition is indeed grave for a large proportion of the population, as the results of the diet survey reveal.

Undernourishment and malnutrition are due partly to underproduction and partly to unequal distribution; and the solution to the problem should be sought on both fronts.

Production of all foods, especially protective foods, should be stepped up so much that they become abundant and cheap enough for the poorer sections of the population to buy. At the same time, productive employment and income of the masses should grow so that they have purchasing power to obtain nutritious foods.

While redoubling our efforts to step up the output of food, we must also give adequate attention to the equitable distribution of available supply. The experience of some countries like the United Kingdom during the last world war shows that a nation can manage with greatly reduced food supplies during emergencies, if distributed equally. It is well-known that during that war, the general standard of health in the United Kingdom registered a perceptible improvement although the per capita intake of food deteriorated both in quantity and variety. The case for redistribution of food in India today is as strong as that for rationing in an economically, nutritionally advanced country during the war time. Here the problem is of course more acute and chronic. Moreover, the main thrust of the Fifth Five Year Plan is on the removal of poverty and one of the instruments for achieving Garibi Hatao is reduction of inequality. The order of "levelling up and levelling down" indicated in the revised version of the Approach to the Fifth Five Year Plan has only cosmetic effect. Instead of tinkering with a proxy like consumer expenditure, why not make a direct attack on hunger, which is the essence of poverty, through redistributing food?

Further, it is now accepted that the intake of different nutrients by any person in excess of his requirements does him no good; the contrary, it can cause him serious health problems. Therefore, a redistribution of food will make everybody better off both the undernourished and the obese. The proposal

for redistribution generally meets with resistance on the ground that even if the available supply of food is evenly distributed there will not be enough to go round. This reasoning only betrays a reluctance to face the issue boldly. The findings of the present study show that the overall availability of food is about sufficient to provide the requisite minimum of essential nutrients. On the contrary, the smaller the supply of an essential item like food, greater seems to be the need for its equitable distribution. The fact of the matter is that under the present dispensation those who need more food get less. True, the ultimate solution lies in increasing output; but this is a relatively long-term solution. But the problem of undernourishment demands an immediate solution, the only policy instrument of which is a redistribution of available food. Further, increased production in underdeveloped countries like India itself hinges upon reduction of inequalities in distribution, especially in that of food intake, since nutritional inadequacy of large sections of the population is a deterrent to increased effort on their part. Unfortunately the Government's nutrition policy, as indicated in the Five Year Plans, evades this issue and seeks remedy through a series of programmes like nutrition education, production of semi-conventional food preparation, etc., whose impact on the nutrition level of the poorer sections of the population is extremely doubtful.

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