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A Study of Food and Nutrient Intakes Among the Dimasa of North Cachar Hills

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ABSTRACT This paper attempts tc describe the food and nutrient intakes among the Dimasa of North Cachar Hills in Assam. The findings indicate that the over-all dietary intake among the Dimasa is more of less according to the Recommended Allowances given by the Indian Council of Medical Research, though the consumption of nutrients like iron, carotene and vitamin B_2 is far below the recommended requirement. The problems concerning the practical method for measuring undernutition in a population were pointed out, taking into consideration the use of Recommended Allowance, for any given nutrient, as a cut-off point and the hypothesis of homeostatic variation in dietary requirements.

INTRODUCTION

Recently, one of the active areas of nutritional research is to assess the extent of a population's failure to achieve a required nutritional status. However, there are a lot of controversies regarding the practical methods for measuring the magnitude of undernutrition in a population (Sukhatme,1982,1990; Seckler, 1982; Osmani, 1992a). One of the groups of scholars are in favour of the use of Recommended Daily Allowances (RDA) as a reference standard to compare and define the nutritional status of a group of individuals, or population. Gopalan (1992) is of the opinion that the use of reference standard for the assessment of nutritional status is to include all those individuals in a population, who are suffering from any degree of undernutrition. On the other hand, some of the scholars like Payne (1992) have argued that such a method consists in an ideal state of nutritional status, which does not really exist. Instead, they have suggested that undernutriton is to be assessed in terms of the magnitude of severe deficiency symptoms that pose a threat to life.

In the present paper, an attempt has been made to describe the nutritional status of the Dimasa in terms of dietary intakes, taking into consideration some of the current viewpoints on the practical methods for the assessment of nutritional status. The Dimasa are one of the Kachari tribes of Assam. Linguistically, they speak the Bodo language which belongs to the Tibeto Burman family. At present, their main concentration is found in the North Cachar Nills district. Some scattered groups of the Dimasa are also found in the Cachar, Karbi Anglong and Nagaon districts of Assam. It may be mentioned that in Cachar and Nagaon districts, the Dimasa are known as the Burman and Hojai Kachari, respectively. Rice is the staple food of the Dimasa. Some amount of pulses like lentil, green gram, cow pea and beans are also consumed frequently. Common Indian vegetables consumed by them include brinjal, bottle gourd, bitter gourd, ridge gourd, squash, pumpkin, cucumber, potato, yam, chilli etc. Consumption of leafy vegetables is very low in the months of September to March. Meat (generally mutton and chicken), fish and egg are taken frequently, but only few families consume milk regularly. Fruits are rarely taken by the Dimasa. This may be one of the general characteristics of food habit in many tribal populations in India (Rajyalaksmi, 1991; Bagchi, 1994). Tea is commonly taken every-day. Mustard oil is the main medium of cooking among the Dimasa. Condiments, which are frequently used include onion, chillies, pepper, ghar (local made), turmeric, salt and spices. Beer type of drink locally known as *Jhu,* is prepared mainly from rice, and it is generally taken during feasts and festivals.

MATERIALS AND METHODS

The present study was based on data collected from Dibarai village in Haflong subdivision of

the North Cachar Hills district, Assam. Weightment method of dietary survey was conducted for five consecutive days in twenty households, taking into consideration the market days for the people of the present study. Each household was visited at least twice daily, prior to cooking. Food items to be cooked for each meal were weighed, using a spring type balance. Foods consumed outside home by member(s) of a household, household member (s) not taking meal at home or guest (s) taking meal in the household within the period of dietary survey, were also recorded. Considering the nature of work generally performed by the Dimasa as moderate, the average consumption of nutrient per consumption (C.U.) per day was computed taking into account the recommended energy requirement suggested by the Indian Council of Medical Research (ICMR, 1989).

The nutrient values of different food items were calculated using the Food Composition Tables prepared by the ICMR (1989), whereas the edible portions of food items were taken from those Food Composition Tables prepared by the ICMR (1971). It may be mentioned that the nutrient values of food items, which were not given in the Food Composition Tables of the ICMR (1989), were based on the mean values of the food items belonging to the same food groups. Further, no correction was made for the wastage or loss of nutrient values owing to washing, cooking, etc.

RESULTS AND DISCUSSION

Table 1 shows the average daily consumption of different types of food per C.U. It shows that the consumption of some major food stuffs like cereals, other vegetables, and fish, meat and egg is above the recommended level suggested by the ICMR (1971). It is, however, found that the intake of other food groups like pulses, leafy vegetables, roots and tubers, fruits, milk and milk products, fats and oils, and sugar and jaggery is much lower than the recommended levels. It may be mentioned that the quantity of different food items presented in table 1 was calculated in terms of their respective edible portions

The average daily intake of different nutrients per C.U. is given in table 2. It shows that the consumption of fats, vitamin B_1, nicotinic acid and vitamin C is well above the Recommended Daily Allowances (RDA) as given by the ICMR (1989). Similarly, the average daily intake of calories, protien and calcium is to some extent according to the RDA. However, dietary intake among the Dimasa is grossly deficient in iron, carotene and vitamin B_2.

If RDA is considered the cut-off point for measuring the nutritional status of a population, one may say that the over-all dietary intake among the Dimasa of the present study is below the minimum requirement in respect of calories, protien, calcium, iron, carotene and Vitamin B_2. Accordingly, shall we consider the Dimasa as undernourished population? It may be noted here that the Dimasa of the present study are categorized as well nourished with regard to some anthropometric indices, such as weight for marasmus and Kwashiorkor, etc. in the present population. Therefore, the use of RDA as a cut-of point for measuring under nutrition in a population seems to invite many questions especially

Table 1: Average daily consumption of different food groups per calorie consumption unit and per capita unit among the Dimasa of Assam (N=50)

Food groups	*Recommended allowance (ICMR, 1971)*	*Average daily consumption*			
		per C.U.		*Per capita unit*	
		X	*SD*	*X*	*SD*
Cereals (g)	475	533.09	135.78	429.20	111.84
Pulses(g)	65	40.58	19.67	32.68	14.18
Leafy vegetables(g)	125	19.89	22.62	16.02	19.16
Roots and tubers (g)	100	85.93	44.28	69.18	33.42
Other vegetables(g)	75	102.92	53.64	82.87	44.49
Fruits(g)	30	7.62	19.13	5.14	14.34
Milk & Milk products(g)	100	26.94	59.29	21.68	46.53
Fats and oils (g)	40	24.30	9.39	19.56	7.69
Fish, meat, egg, etc. (g)	30	36.45	22.17	29.38	17.65
Sugar and jaggery (g)	40	18.30	10.12	14.73	8.86

Table 2: Average daily consumption of different nutrients per calorie C. U. and per capita unit among the Dimasa of Assam (N=50)

Food groups	*Recommended allowance (ICMR, 1971)*	*Average daily consumption*			
		per C.U.		*per capita unit*	
		Mean	*SD*	*Mean*	*SD*
Calories (kcal.)	2875	2455.32	615.92	1942.46	528.88
Animal Protien (g)	0	7.17	4.74	5.67	3.87
Vegetable Protien (g)	0	51.62	11.86	40.84	10.33
Total Protien (g)	60	58.79	14.43	46.48	12.46
Fats(g)	20	30.51	13.09	24.14	10.30
Calcium (mg)	400	348.40	157.68	275.63	137.34
Iron (mg)	28	17.83	8.21	14.11	7.12
Carotene (micro g)	2400	467.96	211.21	370.22	213.00
Vitamin B_1 (mg)	1.4	1.59	0.39	1.26	0.49
Vitamin B_2(mg)	1.6	0.73	0.62	0.58	0.53
Nicotinic acid (mg)	18	23.61	6.13	18.68	4.95
Vitamin C (mg)	40	40.69	15.82	32.19	14.68

in relation to the practical validity of such method in the field situation. Of course, the frequency of certain clinical signs of undernutrition is the general expectation in undernourished population (Payne, 1992). However, such an observation may not require much technical skills in respect of certain deficiencies. For instance, iodine deficiency in the state of Sikkim is generally reported on the basis of the high frequency of goitre and endemic cretinism (Ray, 1992). Likewise, the high frequency of certain deficiency diseases and infections can be easily examined with our naked eyes among the tribal population of Melghat region in Maharashtra (Bavadam, 1996). So the question may arise whether or not the definition of RDA should be expanded to include the frequency of certain deficiency diseases?

Payne (1992) is of the opinion that the techniques for measuring nutritional status should consist of some clinical symptoms as evidence of undernutrition. Therefore, the only practical way of assessing nutritional status is to be related to the assessment of the magnitude of certain deficiency diseases, which are threatening to life. On the other hand, Gopalan (1992) and others have objected that the assessment of undernutrition is not always concerned with the call for measuring the frequency of severe clinical symptoms. Gopalan has argued that severe undernutrition does not develop within a day, but it passes successively through the stages of mild and moderate forms of undernutrition. Moreover, functional impairment, which is not so serious today may become so in due course. Accordingly, he is in favour of the use of RDA as a cut-off point for measuring undernutrition in a population.

These differences in views have led to controversy regarding the practical method for assessing nutritional status of a population. Moreover, the presence of intra-individual and inter-individual variation in dietary intakes has made the assessment of nutritional status more complicated. Sukhatme (1982, 1990) has suggested that the energy intake needed by an individual to maintain body weight as to perform certain fixed standard tasks is different from day to day and is self regulated. Therefore, the energy requirement of man for any period should not be defined as fixed value but as a homeostatic range. An individual is to be considered as undero urished if his dietary intake is outside the lower limit of the homeostatic range, *i.e.* the minimum requirement. Accordingly 50% of the people in India are said to be undernourished, such a proportion many between 15% and 20% only, if minimum requirement of energy is used as the cut-off point *i.e.* about 60% to 70% of the recommended requirement.

Though Sukhatme's hypothesis seems to have certain implications for the interpretation of the nutritional status of the present population, the question may however, arise whether or not a group of people would follow the norm of homeostatic variation? One may infer that at least some numbers of the group are likely to have shortfalls that are not homeostatic in nature, such people would be genuinely undernourished

(Osmani, 1992 b). It has also been pointed out that the protien requirement of a person would not be met if he consumes calories according to the minimum requirement suggested by Sukhatme (Gopalan, 1992). Of course, it is generally believed that the protien requirement of an individual could be compensated if he gets enough calories as per the RDA. Moreover, many nutritionists have made it clear that 'The recommendations cannot be used for examining the nutritional status of a population. Comparisons (of dietary intakes with requirements cannot in themselves justify statements that undernutrition, malnutrition or overnutrition is present in a community or group, as such conclusions must always be supported by clinical or bio-chemical evidence' (FAO/WHO, 1973).

Table 3: Distribution of households according to different levels of calorie and protien consumption

Consumption levels (% of the requirement)	*Frequency of households*			
	Calories		*Protien*	
	No. of house-holds	*%*	*No. of house-holds*	*%*
Below 60	0	0.00	1	5.00
60 to 90	15	75.00	16	80.00
Above 90	5	25.00	3	15.0

Table 3 shows the distribution of households according to different levels of protien and calorie consumption. It is found that none of the households consumes less than 60% of the recommended requirement. With regard to protien intake, only 5% of the households consume less then 60% of the RDA. So most of the Dimasa households of the present study are not undernourished according to Sukhatme's hypothesis, but the situation is just reverse if we use the RDA as a cut-off point.

In view of the above circumstances, we have taken into consideration - 4SD (*i.e.* mean - 4SD/$\sqrt{N}$) as the cut-off point for screening the present population into two groups that may likely to be undernourished and well-nourished. Those households consuming a nutrient below - 4SD (*i.e.* Below Mean - 4SD /$\sqrt{\ }$ are categorized as undernourished and those consuming more than - 4SD (*i.e.* Above Mean -4SD /$\sqrt{\ }$ are classified as nourished groups. For instance, table 2 shows that the mean calorie intake per C.U./day for 20 Dimasa households is 2455.32 kcal. with a standard deviation of 615. 92 kcal. Taking - 4SD as the cut-off point, the minimum energy requirement among the Dimasa may be taken as 1904 kcal. Considering the wide intra and inter-individual variation in nutrient requirements, as suggested by Sukhatme (1982, 1990), it seems to be apprpriate to consider- 4SD as the cut-off point for screening the nutritional status of the present population.

Table 4: Nutritional status of the Dimasa in respect of calorie and protien consumption

Nutrient	*Nutritional status*			
	Nourished		*Undernourished*	
	No. of house-holds	*%*	*No. of house-holds*	*%*
Calories	18	90.00	2	10.00
Protien	14	70.00	6	30.00

Table 4 shows that about 90% and 10% of the households are nourished and undernourished, respectively, in respect of calorie intake. With regard to protien, these frequencies are 70% and 30%, respectively. It may be mentioned that this method of screening assumes an ideal state of undernutrition rather than taking the severe clinical symptoms of undernutrition. So a household or group of individuals, which is classified as undernourished, may be well nourished and *vice versa*. Therfore, such a conclusion should be supported by other evidence in terms of anthoropometric indices, clinical examinations and other bio-chemical tests.

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