REVIEW OF LITERATURES AND AIMS AND OBJECTS OF THE STUDY

Chapter II
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A brief review of the available literatures related with the studies of food, food habit, intake pattern especially for the assessment of growth pattern as affect of nutritional status among different populations have been given in this chapter in order to provide some background information, which would be useful for the present study. In the last section, the aims and objects of the present study have also been stated.

General

Man had been trying to probe the mysteries of nourishment of body from time immemorial and ever since it had continued (Lusk, 1933; Mc Collum, 1957; Mc Collum et al., 1939; Hawley et al., 1955; Tayler et al., 1956). Ancient philosophers made many prophetic observations, which the modern science still upheld. One such person was Hippocrates (460-359 B.C.), the Greek philosopher. Among his aphorisms, one states that “Growing bodies have the most innate heat; they require the most food, for otherwise their bodies are wasted. In old people the heat is feeble and they require little fuel, as it would be extinguished by much.” His pronouncement that “Persons who are naturally very fat are apt to die earlier than those who are slender” is still familiar in current literature (Lusk, 1933).

Leonardo da Vinci (1452-1519), the Italian artist, anatomist, biologist and aeronautical engineer made statement about nutrition that have a modern connotation. Concerning the need for nourishment “if you do not supply nourishment equal to the
nourishment departed, life will fail in vigour; and if you take away this nourishment, life is utterly destroyed" (Lusk, 1933). Antoine Laurent Lavoisier (1743-1794) established the basis of our understanding of energy needs when demonstrated that burning food in our body needs oxygen. A number of physiologists continued with the work of Lavoisier and as a result we have come to know the caloric needs of men, women or child for a particular type of life.

Much progress was made during the nineteenth century in the identification of nutrient materials in food that were necessary for life and well being. Francois Magendie (1783-1855) – a French scientist demonstrated that animals could not survive on sugar, butter, or olive oil, or gum arabic and distilled water alone. He concluded that protein element was necessary. His student, Claude Bernard (1813-1878) discovered glycogen and postulated that pancreatic juice performed some function that is necessary for the absorption of fats. In Germany, Baron Justus Von Liebig (1803-1873) preached that fats and carbohydrates were fuel food and termed as plastic food. Karl Von Voit (1831-1908) believed that the requirement of protein is dependent on the organised mass of the tissue; the requirement for fat and carbohydrate is dependent on the amount of mechanical work accomplished (Lusk, 1933). That brings us to the twentieth century and our own time. Never in the entire history of nutrition have the strides of this century been paralleled. The studies in this era have encompassed the discovery and identification of certain nutrients e.g. the vitamins, amino acids and certain minerals; the nutrient needs in health and in disease, the specific and interrelated functions that these nutrients play, sources of these nutrients, and their use to enrich food to a higher nutritive value, all for the benefit of mankind. The discovery of the essential amino acid started with the work of Hopkins (1906) at Cambridge and T. B. Osborne and Lafayette B. Mendel (1911-1924) at Yale and completed with the work of William Rose (1930-1935) at Illinois. The story of the vitamins was unraveled starting with the work of Mc Collum (1913) at Hopkins and Mellanby (1921) in England on vitamins A and D and ending with the isolation and characterization of vitamin B12 (Swaminathan, 1990). The work on minerals was
started in the nineteenth century with calcium, iron, phosphorous, potassium and iodine has proceeded throughout that period and continues till today.

Many have pointed out that even in this space age nutrition poses as one of the world’s most pressing problem. On one hand, the affluent nations are suffering from over nutrition and on the other hand, the developing nations are ailing from under nutrition (Hundley, 1959; Jelliffe, 1966; Robinson, 1967; UNICEF news, 1972). It is said that any deviation from ideal nutrition may be over or under nutrition, leads to malnutrition. The majority of the population, unfortunately, irrespective of the economic status, is suffering from this disease. However, the problem of under nutrition far exceeds that of over nutrition. More than half of the world’s population is suffering from a certain degree of starvation, subsequently resulting in undergrowth and underdevelopment. For example, the average normal weights of Indian male and female are 55 kg and 45 kg respectively, whereas for the corresponding population in the western countries are 65 kg and 55 kg. (Gopalan and Vijayraghavan, 1971). It is well authenticated that malnutrition may leave permanent imprint on social life, psychological behaviour, mental and physical performances (Winick, 1970; Cravioto, 1971; ICMR Bulletin, 1975, 1976). Mc Namara (1973) has warned that hunger and malnutrition saps energy, stunt bodies and slow mind. Gopalan (1972) and Devdas (1972) have pointed out that the total cost of treating malnutrition is much higher than its prevention. The acuteness of this problem can be gauged by the fact that several national and international organizations such as Food and Agricultural Organisation (FAO), World Health Organisation (WHO) and United Nation International Children’s Emergency Fund (UNICEF) are actively engaging to improve the nutritional standards. A report of William R. Leonard (1989) regarding the nutritional determinants of high-altitude growth in Nunaq; Peru has pointed out that children of the upper socio-economic status having significantly taller and heavier than the lower socio-economic status (SES) group children. The finding has also demonstrated how social and environmental forces interact to create differential levels of stress that contribute to variation in biological well being.
Average life expectancy in many Asian Countries ranges from 35 years among the Bangladeshis to 51 years among the Pakistanis, while for the Indians it is estimated to be about 41 years (Statistical Year Book, 1977). Life expectancy in other European and USA population including those of Japan are comparatively quite high, the average being 70 years and above invariably in all. The lowest in it has been observed among the Americans with 72.6, while the highest has been recorded among the Icelanders with an average of 76.1.

A pattern has been observed that increases in life expectancy have been paralleled by increases in body size, and the most pronounced changes have again occurred in the industrialised countries. Eveleth and Tanner (1976) have reported that in the USA, the trend towards increased body size has peaked, with mean statures remaining unchanged for the past two decades. A similar pattern appears to be emerging in the other industrialised countries including Japan (Stini, 1980).

The process of ageing in the organisms is one in which cell number decreases and metabolic rate declines (Forbes, 1974; Melina, 1969; Tzankoff and Norris, 1978). The reduction in the number of metabolising cells lead to a net reduction in the total number of reactions requiring energy. The phenomena associated with the decline of human body size with age begun to be understood early recently. The contribution of muscle to total body protein metabolism in older people than in younger ones has been pointed out (Young, 1978; Young and Munro, 1978). Improved medical care and diets abundant in both protein and energy sources are essential elements for the maintenance of health. Children, pregnant ladies and lactating mothers represent most vulnerable groups, as they need extra nutrients to combat their additional stress (Jelliffe, 1966).

Chavez et al. (1973) working in a poor rural population in Mexico, recorded greater efficiency of protein intake in male children during breastfeeding. Chavez calculated a weight increase of 4.9 grams per gram of protein ingested by male infants and 3.7 grams per gram for females and, thus, concluding that males are more efficient synthesizer of carcass protein in circumstances of low protein intake.
India

Dietary surveys and analysis of various types of diets consumed in different segments of the society have been quite fruitful in assessing caloric and nutrient intake. Such reports from various countries of the world including India are available (Gopalan, 1962; Jelliffe, 1966; Rajalaxmi, 1969). These surveys discreetly revealed that a substantial segment of our population remains languished with under nutrition and specific deficiencies (Rao et al., 1959; Gopalan, 1968; Rajalaxmi, 1969; Gopalan and Vijayaraghavan, 1971). It has been reported that in India, research in the field of nutrition was started in the decade of the twentieth century by Mc Carrison and Mc Cay, the pioneers in the field and they were impressed by the fact that the physique and health of the Indians varied in different parts of the country and they were convinced that the underlying cause was dietary. Then, Mc Cay diverted his attention towards the protein of inferior quality both from the standpoint of digestion and utilization was responsible for the poor physique and stamina. Nutrition researches in India were extended to the study of individual nutrient only towards the end of Mc Carrison’s active carrier.

As per report of the National Nutrition Monitoring Bureau, the incidence of severely malnourished children in our country from the period of 1969 to 1975 was as high as 18 to 20% (Gopalan, 1988). As such, a majority of malnourished children fail to achieve their full genetic potential in linear and ponderal body dimensions and are, thus, stunted or wasted or both. A countrywide survey covering children revealed that 90% of the children had heights and weights below the 10th percentile value of American children (Vijayaraghavan et al., 1971). Many affected children die before the age of 5 years and about one half of those survive to attain their full potential bodily growth (Sharma, 1992). Haque’s (1990) study among the 5 tribal groups such as Bhil and Garasic of Rajasthan, Pedar, Rabari and Charane of Gujarat and Bonda of Orissa has revealed that all the tribal groups are undernourished, due to poor health condition and lack of adequate calories and protein consumption.

In a vast country like India with multiethnic, multilanguage and multireligious beliefs, the extent and type of malnutrition among children varies from region to
region, from state to state and from group to groups (ICMR, 1972; Gopalan, 1988; Nutritional Foundation of India, 1988). Rao et al. (1989) observed among the Onges of Little Andaman Island, unlike earlier days, lesser consumption of flesh and seafoods and entry of newly introduced foodstuffs like fresh coconut, oil, milk powder and pulses as the new diet items. As a result of these changes, the protein intake has decreased from 140 gm. in 1964 to 127 gm. in 1969 and further to 69 gm. in 1989, thereby decreasing consumption of other nutrients like calcium, iron, vitamin A, thiamine and riboflavin over the period.

Socio-economic status plays a dominant role in the growth and physical development of children. Children from different socio-economic classes within the same community differ in their average body size at all ages, even at birth, those of upper socio-economic class having the highest. The influence of socio-economic factors is manifested in the nutrition and the entire environment, which the children are compelled to adopt. Children from better socio-economic classes would naturally have better nutrition and better environment (ICMR, 1989).

Another study of physical growth and nutritional status is available from among the Savara tribal girls of Andhra Pradesh and it has revealed that these girls have exhibited maximum mean annual increments between 11 and 12 years, and that these girls are taller and heavier than the national standards (ICMR 1984), despite of low mean consumption of calories, protein, iron, calcium, thiamine etc. (Rao and Busi, 1997). A socio-economic and diet survey among four tribal groups of Andhra Pradesh namely, Jatapu, Savara, Gabada and Kondadora who are agriculturists and labourers show deficiencies in nutritional intake among pre-school children and the women with B-carotene, vitamin-C and riboflavin deficiencies (Rajyalakshmi and Geervani, 1992). Another tribal children population from the Vishakapatnam district of Andhra Pradesh has also revealed that tribal boys attained maximum mean annual increase between 12+ and 13+ years, while for girls it is 10+ and 11+ years. The boys and girls of this data are taller and heavier than the findings of Dharma Rao et al. (1998) and taller than the findings of Nath et al. (1991).
Few data on growth studies are available from the North East Indian population (Das and Choudhury, 1992; Choudhury et al., 1992; Devi, 1990; Gaur and Yaima Singh, 1994; Inakhunbi and Saratchandra, 2001 etc.) for which the nutritional status have been partly attempted to assess indirectly through Anthropometric measurements. According to Begum and Choudhury (1996), the prevalence of malnutrition among Assamese Muslims of Kamrup district is as high as 42.07% among the boys and 45% among the girls due to the resultant interaction of various factors forming environmental as well as micro-environmental surroundings. In another study of Kulkarni and Sarma (2001), it has been reported from the Karbi tribe of Assam that 57.5% of the population are malnourished.

**Manipur**

Devi's (1990) finding of Meitei girl's superior height and weight from those of the Muslim girls and of Inakhunbi's (2001) finding of Meitei boys over those of the Kabui boys have all been explained from the point of view of better nutritional intake of the Meitei boys and girls as compared to their counterparts. Better of economic and educational status of the Meiteis have been pointed out as the main contributing factors.

The study of Evenly Angel Pasweth (1991) regarding the nutritional status among the pre-school children in Meitei population of Manipur, for which the data have been drawn mainly from the social class IV and V, have revealed lower mean weight and height than those of the Harvard and ICMR standards. She further pointed out that the weight and height of these children are more affected when compared with the measurements of their other body parts.

Another study of Singh K.S. (1994) among the hills and plain children (2-6 years) of Manipur, represented by the Meiteis of Manipur valley and 3 other tribal groups of Tangkhul, Mao and Anals of the hills, have shown the Meitei children irrespective of sex having advance growth rates till the age of 4 years. A better living environment, education of the parents and economic status has been considered as the favourable factors for such phenomena. Luwang (1981) however, found the Tangkhul...
Naga children having higher weight and better nutritional status than the valley children represented by the Meitei and he attributed this due to the nature of food and dietary consumption pattern of the tribal population.

Singh Yaima Ningthoujam made a comprehensive study of the nutritional status among rural Meitei children of Manipur in 1989, based on the data collected from the Thanga village of Bishnupur district, Manipur and reported a high incidence of different vitamin deficiency signs (Gaur and Yaima Singh, 1994). It was further pointed out that the predominantly cereal-based and starchy diets of Meitei children, though providing enough calories, are deficient in many important vitamins and minerals. Further also commented that the lack of the intake of fruits and vegetables among these could be the main contributing factor for such a sign of deficiency.

In another sub-group Meitei children population from Khangabok village, Akhoykumar Singh et al. (1997) have revealed the anthropometric pattern of height, weight, head circumference, chest circumference, mid-arm circumference and calf circumference having not lower mean values when compared with other Indian communities.

Indian Council of Medical Research (ICMR) has yet to cover data from the North-East India in general and specially from the state of Manipur. Studies on the areas of food, dietary habits and the health status of the people of this region considering micro-level investigations are highly expected in view of understanding the general health and well being of these people. The ICMR (1994), however, finally suggested that substantial additional surveys and studies need to be carried out in different parts of the country and different reasons to arrive at estimates of energy expenditure in various occupations as a part of health survey.
AIMS AND OBJECTS

The present study has envisaged to study the variation in height, weight and food intake among the Meitei families considering a village population, which is neither a pure rural population nor a pure urban population. The importance of such micro-level studies have already been pointed out earlier. The chief aims and objects of the present study will, therefore, be as follows:

1. To attempt to understand the sources and type of food and food habit of the Meiteis of Manipur.

2. To estimate the weekly consumption of carbohydrate, fat, protein and calorie value among the different social classes in the light of the amount, type and nature of food consumption of the people.

3. To assess the variation of height and weight among the members of the families belonging to different social classes considering age and sex.

4. An attempt shall also been made to compare the height and weight of the boys and girls of the present population with some of the available data of Manipur and more particularly with the populations of India specially covered by the Indian Council of Medical Research (ICMR, 1989, 1994) and outside India by the National Centre for Health Statistics (NCHS, 1987).