STUDIES ON THE ASSESSMENT OF NUTRITIONAL STATUS AMONG THE MUNDA POPULATION OF DELTA REGION, SUNDARBAN, WEST BENGAL, INDIA.

SYNOPSIS OF THE THESIS SUBMITTED BY

SANDHYA MRIDHA

FOR THE AWARD OF DEGREE OF

DOCTOR OF PHILOSOPHY (SCIENCE)

OF

JADAVPUR UNIVERSITY, KOLKATA

DEPARTMENT OF FOOD TECHNOLOGY

AND BIOCHEMICAL ENGINEERING

JADAVPUR UNIVERSITY

KOLKATA, INDIA

2023

SYNOPSIS

Index No.: D-7/ISLM/02/18

Title: "Studies on the assessment of nutritional status among the Munda population of delta region, Sundarban, West Bengal, India."

Introduction: Specifically, the sum of the processes through which an animal or plant ingests and utilises food ingredients is the act of nourishing or the process of being nourished.

The study of nutrition examines how nutrients and other ingredients in a diet affect an organism's maintenance, development, reproduction, health, and susceptibility to disease. Food intake, absorption, assimilation, biosynthesis, catabolism, and excretion are all included in this process. The foods that an organism consumes make up its diet, which is greatly influenced by their accessibility, processing, and flavour. A nutritious diet comprises food preparation and storage practises that protect nutrients from oxidation, heat, and leaching, as well as lower the chance of contracting a foodborne illness.

Carbohydrates, fibre, fats, protein, and water are the macronutrients. In addition to providing energy, the macronutrients (except fibre and water) also serve as building blocks for proteins and cell membranes, as well as some signalling chemicals. Energy is measured in k calories. Some structural material can be used to produce energy internally. While lipids supply 9 kcal per gm., while carbohydrates and proteins offer roughly 4 kcal per gm. of energy, respectively. The net energy from either depends on factors like digestion and absorption that vary greatly from situation to situation. Water, fibre, vitamins, and minerals are needed for other reasons but do not themselves provide energy.

In India researches on nutrition began in the first decade of 20th century and remain confined among the prisoners and army personals, McCay was the pioneer. In the year 1911, the Indian Research Fund Association initiated research on disease and their preventions. During 1928-29 Mc Carrison established the Nutritional Research Laboratories to facilitate the researchers. Aykroyd and Krishnan in the year 1937 initiated the diet survey to understand the nutritional status. These techniques helped us to find out the drawbacks of the studies on dietary pattern. Earlier Indian anthropologists studied food and food habits of

different ethnic groups but today, they also study the nutritional pattern and nutrition deficiency diseases. It is well-know that we, the Indians, generally consume carbohydrate rich diet, whereas, the people of western countries consume protein rich diet and by this they surpass the Indians as regard to physical fitness. Mc Carrison is of opinion that the population groups of western countries "are long lived, vigorous youth and age, capable of great survival and enjoy a remarkable freedom from disease in general. Their diets are the unsophisticated food of nature and the healthiest diet of the mankind"(Sengupta,1953).

The consumption of diet is an important phenomenon and it is controlled by the biosphere of the region. Such metabolic changes which are related with the nutritional adaptations of the population group concern were observed by various authors among the people who consume diet with different proportion of the basic nutrients (Hinsworth 1934, 1936, Drury *et al.* 1959, Vaughan *et al.* 1956). According to their observations some are habituated with high protein rich diet while others consume carbohydrate rich diet. The Eskimo and the African populations are the glaring example of the aforesaid variation.

In India, the nutritional studies on ethnic basis were mostly carried out among the tribals. Most of these studies are unable to ascertain the degree of changes between the people as per geographical location. India is the land of diverse people belong to different ethnic, linguistic, religion as well as socio- cultural heritage. Similarly, the diet of the different ethnic groups also varies from region to region and from group to group. The diet survey among the three different economic classes reveals that the effect of diet has a direct role on the body dimension and nutritional deficiency disorder (Wilson *et al.* 1938). Similar type of work has been carried out in Dinajpur, West Bengal; Jorhat, Assam and Calcutta, West Bengal. Thousand children were taken into consideration to evaluate the degree of nutritional difference between the groups (Mitra, 1939). Study shows most of the children suffer from malnutrition. Mitra (1940) is of opinion that the consumption of oil, fats and milk is maintaining a positive correlation with the per capita income. While consumption of vegetables gives a negative correlation. Among the Tribes it has been found that consumption of nutrients largely depends upon per capita income of the family member (Mitra 1942). Along with economic condition, ignorance and tradition also play a great role in shaping the nutritional status of the family in particular and community in general. Apart from all these, factors like climate, soil, natural resources also affect the dietary pattern and nutritional status of the community. Body measurements became accepted on a global scale in 1956 as a way

to assess the nutritional status of a population. The suggestions for body measurements for characterising nutritional status made by the committee on nutritional anthropometry of the Food and Nutrition Board of the National Research Council were published (Hum. Bio-I. Vol. 28 p). Prior to this, many indices such as Pignet Index, Korperfulla Index, Pelidisi Index, Body Mass Index, Weight-Height Index were used. The committee suggested a formula for estimation of standard weight from the skeleton measurements of an individual. The departure of the actual weight from the standard weight is said to be the estimation of adiposity of the individual. Garn (1962) applied anthropometry in clinical evaluation of nutritional status. Jelliffe (1966) has summarised the findings all over the world and recommended the methods for assessing the nutritional status of a community.

Studies on dietary habits and intake on ethnic groups in India were initially carried out in the North Eastern Region which was mostly anthropological in nature (Sengupta 1952, 1953 and 1955). Roy and Rao 1956, 1957a, 1957b, Roy *et al.* 1957, Sengupta and Rao, 1957. Sengupta 1960, Sengupta and Biswas, 1956a, Roy and Roy 1967, Roy 1970, studied the socioeconomic condition, dietary habits and nutrient intake of the communities. This study was later extended on different parts of the country on the community basis. Especially is on the tribal groups. Study on body built with nutrients intake was started with the study on Nicobarese (Roy and Roy, 1967) followed by the work on Koya (Roy and Roy, 1971). Dietary intake and the adult body measurements to assess the nutritional status of the tribal communities like Kharwar, Lakshadweep Islanders, Juang, Santal, Dubla, Kokni, Bhil, a Christian community, Kanwar, Oraon have been undertaken by Bhattacharya et al. *1972*, 1981 and 1985; Roy *et al.* 1978 and 1982; Roy and Roy 1982; Banerjee and Biswas 1986; Biswas and Mukherjee 1983. Bhattacharya et al. *(1994)* extended the study by including the intestinal parasites infestation, haemoglobin concentration and blood pressure along with body measurements and dietary intake among the Oraon of Sundarban. Roy and Roy in 1982, have shown how the anthropometric measurements change with the forced semi- starvation among the Juangs of Orissa. This work had some bearing with, the famous study of Keys *et al.* (1950) among the Minnesota men where volunteers were kept under semi-starvation in experimental condition.

Nutritional status among the people of Sundarban will be assessed by dietary intake that is diet survey, nutritional anthropometry and percentage of the haemoglobin measurement, evaluation of the different index like BMI, Pignet Index, Weight- Height Index

etc. Main livelihood of the people is cultivation, fishing and collection of the resources of the forest materials like honey, wax wood, fishes and crabs etc. Literacy rate among the population is moderate. Dietary pattern is non-vegetarian. Main cereals food are different types of rices. They use various kinds of pulses like musur, mung, arhor etc. They also use different types of vegetables and leafy vegetables. The conjunction of various nutrients is found to be adequate which compare to those of the required allowances of the ICMR. However, they consume more fat and protein from the different types of the fishes, which are collected, from the Khari of the rivers.

Area and People: Neighbouring part of the Sundarbans named Sardarpara, luxbagan of lahiripur Gram Panchayet, Gosaba Block, South 24 Parganas, West Bengal, India is the study area. It is situated geographically southern part of the South 24 Parganas. The geographical position is delta region of Sundarbans. Most of the people are locally settled. Some of the peoples are coming from Bangladesh near about sixty years ago. The reclaimed land of Sundarbans from adjacent areas like Jessore, Khulna, Satkhira areas of the East Bengal (now in Bangladesh) and Midnapure of West Bengal.

Aim (Objective) of the Study: To predict of the Nutritional background or merit of the delta region Sundarbans. Normally, this region is somehow differing from the other well-communicated region. This study is also reflected the picture of the nutritional profile, literacy rate, economic status, mortality, morbidity culture of Indian scenario.

Methodology: The assessment methods include the all techniques like clinical examination, anthropometry, biochemical evaluation, functional assessment, assessment of dietary intake, vital health statistics, ecological studies. Parameters like demography, socio-economic condition, literacy rate, food production, quantitative dietary intake, anthropometric measurements, physiological variables, and percentage of haemoglobin concentration, arterial pressure, and such others were taken into consideration.

(i) To measure the weight, height, chest circumference (for male only), arm circumference, Body Mass index, percentage of haemoglobin, blood pressure, blood sugar.

(ii) Food Intakes (different types of food): Vegetarians and Non-vegetarians both types of peoples are lived here. Season wise vegetables, cereals foods, pulses, fishes, meat, chickens, fruits and specials type of fruits are sundari and

kewaras. Calculate the per unit and per capita consumption of the different nutrients.

(iii) Diet survey for seven days.

(iv) Drinking-water and sanitary facilities.

(vi) Scio-economic pattern of the people of the area, health and economic status Index.

(vii) Bio-statistic or bio-mathematical correlation between biological variables which is collected from study area.

(viii) Estimation of the malnutrition, under nutrition, over nutrition that is categories into obese, protein intake.

(ix) Local medicine (Ethnic Medicine), sometimes which is used for the recovery of the diseases of that area.

Instrument used: Weighing machine, Anthropometric rod, measuring tape, Shali's haemoglobin meter, Sphygmomanometer, Harpenden skin fold callipers, Salter's balance for measuring of the raw food materials etc.

Outcome of the research work: This research project may be highlighted on the overview picture and day to day life of the Munda community of different geographical delta region of the world. Also reveals as a whole literacy, socio-economic status, rate of mortality, rate of morbidity and so many important factors which are directly associated with development of whole region. Researcher spent her childhood in this delta region, now a day frequently, she visited his native land and she think up gradation, modern facilities and overall development of this area. Holly, researcher realised the actual scenario of the people, area and life. Ultimately, she will get the identity, ecology, social organization, economy, linkage, developmental profile of the people in that region. The quantitative and qualitative profile of the Munda's tribal life will reflect from this unique valuable study.

References:

1. Census Book, 2011 of the studied area, Dayapur, South 24 Parganas.
2. Gopalan.C., B. V. Ramasastri and S.C. Balasubramanium, 2009: Nutritive value of Indian Foods. National Institute of Nutrition, Hyderabad.
3. Roy, J.K. and B.C. Roy 1982: Hunger and Physique, Mem. No. 55 Anthropological Survey of India.
4. ICMR, 1993: Nutrient requirement and recommended dietary allowances for Indians. ICMR expert group report, National Institute of Hyderabad.
5. RAJAGOPALAN, M.V. 1978: Nalgonda, Andhra Pradesh, District Gazettes, Govt. of Andhra Pradesh, Hyderabad.
6. SINGH, K.S.1998: People of India, N.S.(Vol). Oxford University Press, New Delhi, VIJAYA RAGHAVAN, K, K.D. and M.C. SWAMINATHAN 1974: Arm Circumference and fat fold at Triceps in well-nourished Indian Children, Ind. J.Med. Res. 62:994 – 1001.
7. JELLIFFE, d.b,1966: Assessment of the Nutritional Status of the community. World Health Organisation, Geneva.
8. SREENATH J. and S.H. AHMED, 1998; c.f. Singh K.S.1998.
9. Thurston, Edgar, 1990: Caste and Tribes of Southern India (Vol5), Govt. Press Madras.
10. Food and Agricultural Organisation, 1957; Calories requirements. FAO Nutritional Studies, No. 15, Rome, Italy.

Sandhya Mridha 26.09.23

26/09/23

DR. UMESH CHANDRA HALDER
Professor of Chemistry
Department of Chemistry
Jadavpur University
Kolkata-700032

26.09.23

Dr. Bidhan Chandra Ray
Former Professor
Department of Chemistry
Jadavpur University, Kolkata