

Dietary adequacy of hill families of Uttarakhand

■ RITA SINGH RAGHUVANSHI, VEENIKA SINGH, SUNITA KHARAYAT AND PRIYANKA JOSHI

Received: 01.10.2012; Revised: 15.08.2013; Accepted: 11.09.2013

See end of the paper for authors' affiliations

Correspondence to :

RITA SINGH RAGHUVANSHI

Department of Foods and Nutrition, College of Home Science, G. B. Pant University of Agriculture and Technology, Pantnagar, UDHAM SINGH NAGAR (UTTARAKHAND) INDIA

■ **ABSTRACT** : The present study was conducted on 683 families residing in three district of Uttarakhand viz., Almora, Udham Singh Nagar and Nainital to assess their nutritional profile. A village proforma and household proforma was used to collect the general information about the village and families. Dietary adequacy was assessed by 24 hour recall method and mean individual intake of nutrients was compared with the recommended dietary allowances. Results showed that majority of population was literate and only 18.5 per cent females were found to be illiterate. Most of the respondents were housewives and their main occupation was agriculture and animal husbandry. Data revealed that diet of women was inadequate in all the food groups except fat and calcium although intake of protein and iron was found to be closer to the RDA. Whereas average nutrient intake of children (11-15 years) was gravely deficient in micronutrients as well as intake of calorie and protein was also skimpy as compared to RDA.

■ **KEY WORDS** : Dietary adequacy, Women, Recommended dietary allowances, Socio-economic profile, Hill families

■ **HOW TO CITE THIS PAPER** : Raghuvanshi, Rita Singh, Singh, Veenika, Kharayat, Sunita and Joshi, Priyanka (2013). Dietary adequacy of hill families of Uttarakhand. *Asian J. Home Sci.*, 8 (2): 403-405.

Uttarakhand, the hill state of Indian republic is well known for its rich biotic wealth, high mountainous peaks, and diverse cultural and climatic system. The total human population of the state is around 10,116,752 of which 4,962,574 are women (Census, 2011). The state covers about 12.18 per cent of the total Indian Himalayan region and about 40 per cent of its total area has different forest types. The socio-cultural activities in this region is characterized by diverse ethnic group, which have developed their own cultures based on available natural resources, giving rise to a cultural diversity. About 75 per cent of the total population of the state is dependent on agriculture. Agriculture of the region is inter-linked with farming, animal husbandry and natural resources (Maikhuri *et al.*, 1996). Women constitute the backbone of the Uttarakhand, as hill agriculture is dependent on them. The participation of women in economic and non-economic activities is considerably higher in the region as they remain busy in performing agriculture work, attending to cattle heads, collecting fuel, fodder and water and doing household activities. Excess workloads coupled with inadequate intake of nutritious food

have led to malnutrition problem among the women. In fact cooking less than required, eating cold or left over of sometimes even skipping meals have been reported not only in the region but also in several developing countries as fuel saving strategies. This practice over a longer period can result lower nutritional levels (Pant, 2001). Keeping in view, present study was conducted in three districts of Uttarakhand with the objective to study dietary adequacy of hill families.

■ RESEARCH METHODS

Present study was conducted on 683 families of three districts of Uttarakhand i.e. Almora, Udham Singh Nagar and Nainital. Eight villages namely Shyali, Khatyari, Pahul and Tallar from Almora, Julikot, Amiya and Mallaloria from Nainital and Gangapur from Udham Singh Nagar district were selected randomly for analyzing the dietary adequacy of rural families. A village proforma and household proforma was developed for data collection regarding the general information about the villages and food consumption pattern and dietary adequacy of rural families. Dietary adequacy of the respondents was assessed by 24 hours recall method and

mean individual intake (as per consumption unit) in terms of raw food calculated. The nutrient intake was calculated using nutritive value given in food composition table (Gopalan *et al.*, 1989). Mean intake of nutrient was comparing the intake with Recommended Dietary Allowances (RDA) for Indians (ICMR, 1990).

■ RESEARCH FINDINGS AND DISCUSSION

Results revealed that all the villages selected for the study were in the vicinity of 1-8 km from KVK/RRS. The population in these villages ranged from 600-1000 with an average number of household from 60-120. Data revealed that among eight villages, only three villages have hospital facilities. No Anganwadi was there in any of the eight villages, however primary schools were there except Pahul and Amiya village. On the other hand, three villages have schools up to High School level. It was observed that four villages have post office facility as well as five villages have telephone facility. All the villages were well connected by electricity and bus facility. Among eight villages, four villages have asphalted type of road whereas others have mud type of road. Majority of the villages hold bore wells and municipal water supply as the source of water for home and for farming they were dependent on rain and tube wells. Common source of fuel was found to be firewood, kerosene and gas in all the households and Gobar gas plant was found in only two villages.

Background information revealed that majority of the population belonged to Hindu religion. Among 683 families in eight different villages, 118 households belonged to OBC category whereas maximum families (465) were in the category of general caste. It was found that 40.7 per cent population was more than 25 years in age group. Educational status of the population in the eight villages revealed that 30.9 per cent were illiterate among them 12.4 per cent were males whereas 18.5 per cent were females.

Majority of the respondents were housewives and their most common occupation was agriculture and animal husbandry. In different classes among eight villages range of income was Rs.1000/- to Rs. 8500/-. According to modified Prasad (2001) classification for income level for rural population, it was found that retired class has maximum per capita income *i.e.* 1406/- while labour class has minimum per capita per month of Rs.834/-. Results indicated that per capita income as per occupation of hill families ranged between III and IV grade. Similarly, Upadhyay *et al.* (2011) reported that majority of the families of three villages of Uttarakhand belonged to III and IV grade.

Table 1 indicates mean nutrient intake of the population among the different classes in eight villages which revealed that the diet of families was deficient in energy and carotene whereas intake of fat (20.23 g) and calcium (556.91 mg) was found to be higher than the recommended dietary

allowances (RDA). The intake of protein (47.2 g) and iron (30.17 mg) was found to be closer to the RDA. Similar results were found by Pant (2001) in dietary adequacy of rural women of Kumaun region. Results for nutrient intake of children in the age groups of 11-15 years depicted that energy intake was only 79 per cent and 64 per cent as compared to recommended dietary allowances. Mean intake of iron and folic acid was 62 per cent and 47 per cent, respectively which are the main components for haemoglobin formation. The average nutrient intake of children was gravely deficient in iron, carotene, riboflavin and vitamin C with not meeting even the 50 per cent of the RDA (Table 2).

Table 1 : Nutrient intake of respondents of eight villages of Uttarakhand (Per consumption unit)

Nutrients	Mean	S.D.
Energy (Kcal)	1347.0	553.76
Protein (g)	47.2	25.24
Fat (g)	20.3	11.12
Carbohydrate (g)	260.0	117.62
Calcium (mg)	556.91	454.33
Iron (mg)	30.17	22.83
Carotene (µg)	1292.37	1042.91
Thiamin (mg)	1.40	1.20
Riboflavin (mg)	1.65	2.45
Niacin (mg)	13.56	11.56
Vitamin C (mg)	47.73	39.30
Folic acid totals (µg)	122.97	101.80

Table 2 : Average nutrient intakes of children (11-15 years) as compared to RDA

Nutrients	Mean	S.D.
Energy (Kcal)	1532.0	356
Protein (g)	40.0	11
Fat (g)	16.2	8.52
Carbohydrate (g)	306.0	135.36
Calcium (mg)	252.0	134
Iron (mg)	14.02	4.93
Carotene (µg)	267.0	180.83
Thiamin (mg)	1.37	0.39
Riboflavin (mg)	0.62	0.25
Niacin (mg)	12.18	3.36
Vitamin C (mg)	13.86	8.93
Folic acid totals (µg)	39.58	10.99

It can be concluded from the present study that women in hilly area were engaged in mainly agriculture work and rearing animals and belonged to lower income group. The dietary intake of hill families was deficient in almost all the major as well as micro nutrients.

Authors' affiliations:

VEENIKASINGH, SUNITAKHARAYAT AND PRIYANKAJOSHI, Department of Foods and Nutrition, College of Home Science, G. B. Pant University of Agriculture & Technology, Pantnagar, UDHAM SINGH NAGAR (UTTARAKHAND) INDIA

■ REFERENCES

Gupta, S., Lakshmi A.J., Manjunath, M.N. and Prakash, J. (2005). Analysis of nutrient and anti-nutrient content of underutilized green leafy vegetables. *LWT- Food Sci. Technol.*, **38**:339-345.

ICMR (1990). Nutrient requirement and recommended dietary allowances for Indian. A report of expert group of the Indian Council of Medical Research, Hyderabad (A.P.) INDIA NIN.

Maikhuri, R.K., Rao, K.S. and Saxena, K.G. (1996). Traditional crop diversity for sustainable development of central Himalayan agro-

ecosystems. *Internat. J. Sust. Dev. World*, **3**:8-31.

Pant, B.R. (2001). Women and nutrition in Himalaya, Final report of the minor research project submitted to the U.G.C., pp. 36, NEW DELHI, INDIA .

Prasad, B.G. (1991). Social classification need for constant updating. *Indian J. Comm. Med.*, **18**:60-61.

Upadhyay, S., Kumar, A. R., Raghuvanshi, R.S. and Singh, B.B. (2011). Nutritional status and knowledge of hill women on anemia: Effect of various socio-demographic factors. *J. Hum. Ecol.*, **33**(1): 29-34.

■ WEBLIOGRAPHY

Gopalan, C., Ramashatri, B.V., Balasubramaniam, S.C. (Revised and updated by Narsinga Rao, B.S., Deosthali, Y.G., Pant. K.C.) (1989). *Nutritive value of Indian foods*. Hyderabad: National Institute of Nutrition (ICMR). <http://www/nfhsindia.org>.

8th
Year
★★★★★ of Excellence ★★★★★