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Dietary Analysis of Cold Arid Inhabitants of Leh (Ladakh): Need for Integrated Agricultural Systems

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Abstract: The study uses cross-sectional data of a sample of 178 individuals from eight villages in Leh district of Jammu & Kashmir state in India. Dietary diversity and availability of nutrients are assessed in the overall socio-demographic, agricultural and nutritional systems. Subjective and objective measures like socio-demographic survey, household dietary diversity score and 24 hr dietary recall were used. It emerged that the region has adequate level of diversity in the diet, however, further improvement is needed to have balanced nutrition. The role of Public Distribution System (PDS) is very crucial in achieving the same. There is a need for designed agricultural system with integration of field crops, horticulture and livestock. Crop diversification with inclusion of high value agricultural crops and introduction of new tuber and cereal varieties like finger millet (*Eleusine coracana)* and maize (*Zea mays)* was suggested to imply the self-reliance in food production and gradually decrease the dependency on subsidized food grains. Legumes and dairy products were significantly deficient in their diet thus interventions are required also to revive the traditional livestock based livelihoods for better nutrition and remuneration.

Key words: Dietary analysis, cold desert, Leh (Ladakh).

Ladakh lies on the rain shadow side of the Himalaya, where dry monsoon winds reaches Leh after being robbed of its moisture in plains and the Himalayan mountains. The district combines the condition of both arctic and desert climate, therefore, Ladakh is often called as the "Cold Desert". Ladakh has acute environmental constraints of extremely high altitude and very harsh climatic conditions permitting agriculture in favorable niches such as valleys and lower slopes. Of the five ecological subzones in Ladakh our survey was mostly confined in Indus valley area which is the eastern part, characterized as cold mountain desert with lakes, poor quality pasture land, and predominantly inhabited by *Ladakhi budhhists* settled along the river beds and alluvial fans. There is wide diurnal and seasonal fluctuation in temperature with -40°C in winter and +35°C in summer. Precipitation is very low with annual precipitation of 10 cm mainly in the form of snow. Air is very dry and relative humidity ranges from 6-24% (www.Leh.nic.in).The net area of the Leh district is 45167 ha in which the net area sown is 10,184 ha of which 8,477 ha is irrigated through channels (*www.diragrikmr.nic.in/*). The stocking of essential items like food grains is a common practice to prepare for harsh winters when most of Ladakh is cut off from rest of the world due to snow bound roads. In such harsh environmental conditions, availability of adequate nutrition and consequent survival assumes significance and priority, especially when crop diversity is low. Nutritional requirements for healthy life at such high altitude, their sources from locally grown crops and their adequacy or otherwise are poorly understood in Ladakh. Hence this study was conducted as a baseline survey to understand the socio-demographic features, the agricultural as well as nutritional system, dietary diversity and availability to suggest and formulate the appropriate developmental plans keeping in view the deficits and priorities (Gopalan *et al.*, 1985).

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Methods

Locale

Leh district is situated between 32 to 36 degree north latitude and 75 to 80 degree East longitude and altitude ranging from 2300 m to 5000 m above sea level (Leh.nic.in). The district Leh has only one tehsil i.e. Leh. Present study was primarily confined in 8 villages namely Shey, Spituk, Stakna, Chuchot, Phey, Matho, Sabu and Khagsar of Leh district.