

Article

Nutrition Transition and Chronic Diseases in India (1990–2019): An Ecological Study Based on Animal and Processed Food Caloric Intake and Adequacy according to Nutrient Needs

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Abstract: The Indian diet is becoming westernized with a potential threat to human health. This ecological study aimed at analyzing the nutritional transition in India during the 1990–2019 period within the framework of the newly developed 3V index, considering the degree of processing starting with industrially processed foods (IPFs, i.e., the Real/Vrai' metric 1), plant/animal calorie ratio (i.e., the Vegetal metric 2), and diversity of food intake (i.e., the Varied metric 3). Total and food group (n = 14) caloric intakes, percentages of animal and IPF calories, adequacy to the Indian Recommended Dietary Allowances, and prevalence of chronic diseases were retrieved from web databases (e.g., OECD.Stats, Our World in Data and FAO-STAT) and Indian food composition table. The total calorie intake increased by 31% over thirty years, being mainly linked to increased consumption of dairy products and IPF, but still remains below the average recommended intake in 2019. The IPF and animal calorie shares increased from 3.6 to 11.6% and 15.1 to 24.3%, respectively, while micronutrient intakes improved in 2019. In the same time, prevalence of overweight/obesity and type 2 diabetes, and cardiovascular disease mortality increased. In conclusion, the evolution of the Indian diet deviates from metrics 1 and 2 and improves in metric 3, which may not be a sufficient metric in terms of the alleviation of chronic diseases. Therefore, while improving food diversity and replacing refined with wholegrain cereals, Indians should also curb increasing their consumption of IPF and animal calories.

Keywords: nutrition transition; India; animal products; industrially processed foods; nutrient intake; chronic diseases

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1. Introduction

Diet-related chronic disease prevalence (e.g., obesity and type 2 diabetes) continues to rise worldwide [1], especially in emerging and developing countries, such as China [2] and India [3], where the nutrition transition is more rapid and impactful toward human health than in developed countries [4]. Furthermore, food system sustainability, social inequalities in healthy food access, the progressive disappearance of small-scale agriculture, loss of animal and plant biodiversity, increased animal suffering from intensive breeding, and environmental degradation all pose serious threats to global health [5–8]. Food systems are globally responsible for 34% of greenhouse gas emissions worldwide, with 24% from agriculture and land-use change activities and 10% from supply chain activities [9]. However, healthier and more sustainable food choices downstream might drive more sustainable food processing (i.e., reducing ultra-processing) [7], which would have the potential also to drive an increase in sustainable food production [10], potentially