

HEALTH ASPECTS OF VEGETARIANISM IN INDIA:

Is it better for health and environment to be a
Vegetarian?

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Vegetarianism

- In recent years, the vegetarian, Vegan, Plant-based dietary pattern has been adopted by an increasing number of people from all over the world.
- India is a country which is often promoted as a vegetarian country. Here, the vegetarian ideology is considered superior based on the ahimsa culture (non-violence). Overall, 30 percent of women and 22 percent of men are vegetarians in India (NFHS 4)
- With the emerging nutrition transition in India, we are facing an "epidemic" of DR-NCDs, along with widely prevalent undernutrition resulting in substantial socioeconomic burden.



What is Vegetarianism?

- The term ‘vegetarianism’ refers to a wide spectrum of dietary patterns characterised by an emphasis on plant foods and avoidance of animal foods
- A vegetarian diet includes-
 - Plants-based diet (fruits, vegetables, nuts, etc.)
 - With or without the inclusion of dairy products or eggs
 - With the exclusion of meat



Methodology

Review of secondary research was conducted, the literature search was carried out in PubMed, ResearchGate and Google Scholar search engines up to December 2019.

A manual search for all other references, national and medical databases was also carried out.

About 30-40 relevant papers or articles reporting relevant health outcomes (either beneficial or harmful), nutrition, environmental effect associated with vegetarian diets especially focusing on India were included and reviewed.



Objectives

- To understand the health benefits of meat-free eating.
- To explore factors which influence people to prefer vegetarian diet in India.
- To explore health related risks associated with plant-based diet compared to nonvegetarian diet.
- To assimilate Nutritional profile of Indian Vegetarians
- To learn environmental effects of vegetarianism and non-vegetarianism



Research Question

“Is being a vegetarian better for health and environment in India?”



Literature Review

- Vegetarian dietary patterns are diverse in India and are typically characterized by low consumption of animal-source foods, in particular red meat (**Agrawal S., 2017**). It examines that diets are changing rapidly in India, with particularly pronounced increases in egg and dairy consumption. It is suggested in the paper that Vitamin B12 bioavailability remains a concern and should be addressed by exploring various dietary patterns associated with deficiency across various regions of India and identifying people who need supplementation. The food production and consumption pattern are very diverse and significantly changing due to the change in economic status, population pressures, urbanization, and lifestyle of people worldwide
- Early human food cultures were plant-based. Major religions such as Hinduism and Buddhism have recommended a vegetarian way of their life since their conception. It is discussed in this paper about recorded history of vegetarian nutrition from 6th century BC in Egypt, Europe, Roman empire, India etc to Renaissance era to modern era. A paradigm shift occurred at the turn of 21st century. Also examined the present state of vegetarianism and predicted the future of vegetarian. This paper reveals that today; vegetarian nutrition has a growing international following and is increasingly accepted. The main reasons for this trend are health concern and ethical, ecologic, social issues. (**Leitzmann C., 2014**)
- The food system adopted by modern society has very serious environmental impacts. This paper is highlighted the impacts of consuming non-vegetarian diet on the environment. According to this paper, environmental issues such as global warming and climate change can be minimized by adopting vegetarianism or by lowering the consumption of meat and other animal-based products. It should be mandatory on the part of government to label carbon footprint value on food products that would further helpful for consumers to choose low impact food products. (**Choudhary A.K. & Kumar N., 2017**).



Literature Review

- Advances in nutrition research during the past few decades have changed scientists' understanding of the contribution of vegetarian diets to human health and disease. Diets largely based on plants foods, such as well-balanced vegetarian diets, could best prevent nutrient deficiencies as well as diet-related chronic diseases. Three models (early model, New model & Proposed model), which depict the expected health risks and benefits of a population following either a vegetarian diet largely based on plant foods or a diet largely based on animal foods (meat-based diet) , are presented in this concept paper. **(Sabate J., 2003)**. It discloses that recent scientific advances seem to have resulted in a paradigm shift: diets largely based on plant foods, such as a well-balanced vegetarian diets, are viewed more as improving health than as causing disease, in contrast with meat-based diets
- The consumption of meat and meat production has increased radically throughout the world. Global demand for food is expected to increase by 70 % by 2050(FAO, 2009). This excessive growth in meat production/consumption brings several impacts on environmental resources. The paper discusses change in people's lifestyle and consumption pattern of nonveg food all over the world. Also put light over the consequences of meat production (livestock farming) on water, land use, rain forest and climate change are discussed. According to this paper, Action to replace livestock products not only can achieve quick reductions in atmospheric GHGs but can also reverse the ongoing world food and water crises so organizations should consider making advocating vegetarianism a major part of their "Save the Earth" campaigns. **(Mishra M. K., 2012)**.



Result & Discussion



Result

- Based on the conducted secondary research on various aspects of vegetarianism, it can be reasonably inferred that the beneficial effects of a vegetarian diet significantly outweigh the adverse ones.
 - There are various health benefits of vegetarian diet in especially respect to prevention of DR-NCDs (Cancer, Cardiovascular diseases, Diabetes etc).
 - The study shows that there are number of factors such as health concerns, ethical, religion or caste, gender, socio-economic status, geographical location etc, which influence people to prefer vegetarian diet in India.
 - Then, it is explored that health-related risks associated with plant-based diet compared to nonvegetarian diet are some micronutrient deficiency which could sometimes leads to diseases such as anaemia, atherosclerosis etc.
 - The environmental effects of consuming meat-based diet are Land & Water Consumption, Biodiversity, Climate change.
 - Assimilated Nutritional profile of Indian Vegetarians suggests Indian's protein deficiencies as against the global recommended standard, as well as the poorer health outcomes of its vegetarian children.
- So, the answer to the research question “Is being a vegetarian better for health and environment in India?” is can't be decided as a well-balanced vegetarian diets, are viewed more as improving health than as causing disease, in contrast with meat-based diets, which could be beneficial for privileged classes people suffering from or want to prevent DR-NCDs or looking for maintaining their health. Nevertheless, in case of under privileged children and pregnant women the vegetarian lifestyle may confer nutritional imbalances and consequent effects on long-term their health.



Effects of Vegetarianism on Human Health

- Vegetarian diets are lower in saturated fats, cholesterol, and animal protein. They are also high in anti-oxidant vitamins like C & E, carotenoids, and phytochemicals.
- Overall, vegetarians have substantially reduced risks of obesity, heart disease, high blood pressure, diabetes mellitus, osteoporosis, hypertension, and some forms of cancer – particularly lung cancer and colon cancer.
- Vegetarian diets that are low in saturated fats have been successfully used to reverse severe coronary artery disease.
- The nutrients of concern include deficiency in essential amino acids, vitamin B12, vitamin D, n-3 fatty acids, calcium, iron, and zinc, which can cause some diseases like anaemia, menstrual disruption, atherosclerosis etc. Although a vegetarian diet can meet current recommendations for all of these nutrients, the use of supplements and fortified foods provides a useful shield against deficiency.

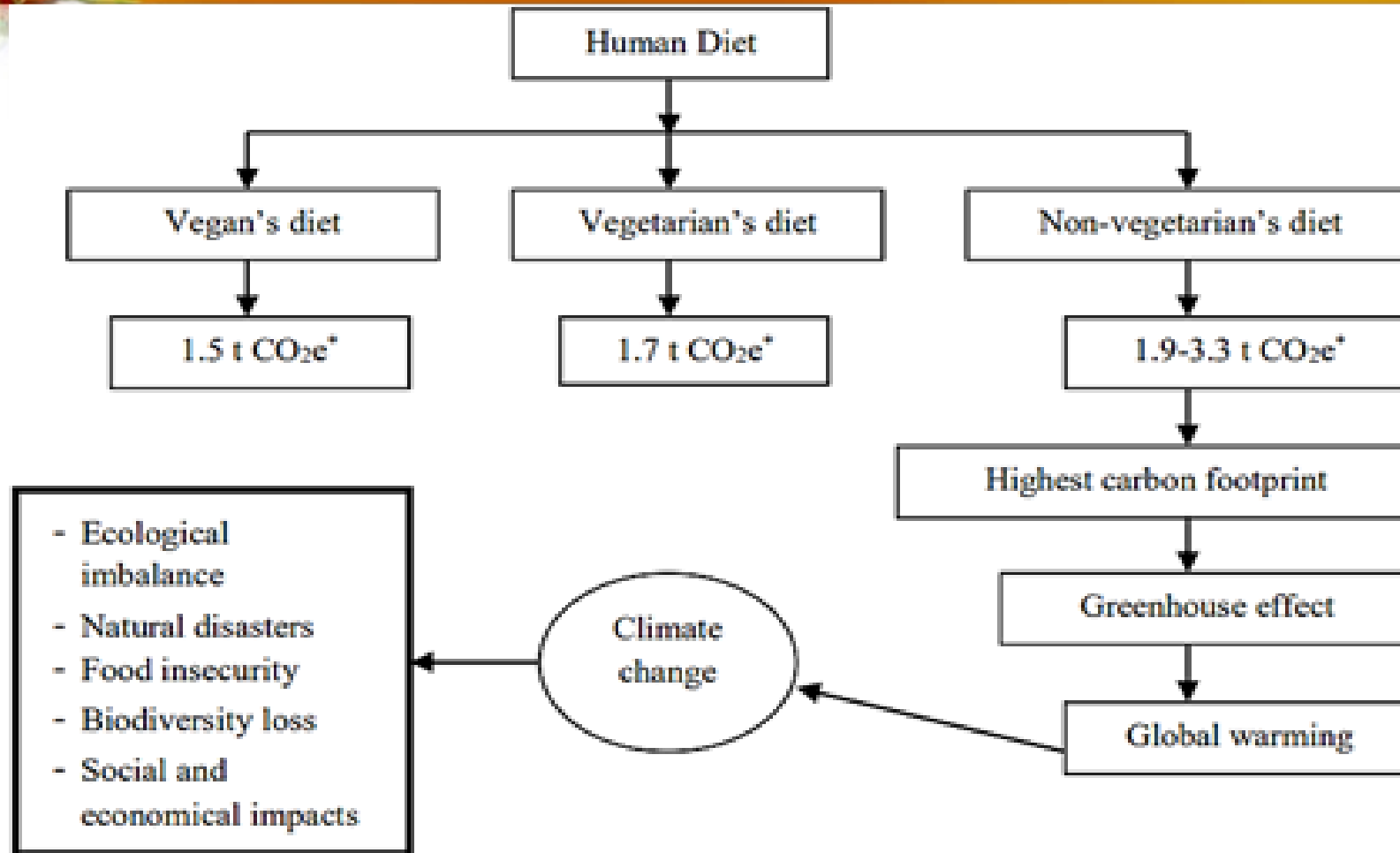


Is Vegetarianism on Environment friendly?

- Albert Einstein, the German-US physicist (1875–1955) believed that “Nothing will increase the chances of survival for life on earth as much as the evolution to a vegetarian diet”.
- Dairy products, eggs, fish, and meat have the higher environmental impacts, while starchy products, vegetables, legumes, and fruits have the lower impacts.
- Meat production contributes significantly to the acceleration of global climate change by adding a large quantity of greenhouse gases (GHG), i.e. mainly carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O), to the environment. Agriculture contributes roughly 15% of all greenhouse gas emissions and half of this comes from meat production.
- In terms of land and water consumption, an estimated 30% of the world’s land not covered with ice is used to grow food, not for humans but for livestock.
- The production of 1 kg of animal protein requires about 100 times more water than 1 kg of grain protein production.



Inter-relationship of human diet with carbon footprints and climate change





Vegetarianism in India

- India is a secular nation and the culture of eating food differs between communities, regions, and religions. Here, the family meal pattern is dictated by geographical region, religion or caste, community, gender, family practices. Other factors such as health concerns, ethical, ecologic, social issues, age, educational level,) as well as socio-economic status (ability to afford) also influence the selection of diet.
- Overall, 30 percent of women and 22 percent of men are vegetarians in India (NFHS 4).
- The consumption of milk or curd, fruits, eggs, and fish or chicken or meat increased with higher levels of maternal schooling and household wealth (CNNS 16-18).



Vegetarianism in India

- India is facing an "epidemic" of DR-NCDs, along with widely prevalent undernutrition resulting in substantial socioeconomic burden.
- More than half of all Indian Children are self-reported vegetarians. For the mothers of children aged 0-4, the share is closer to 45%. Within India, as is now well known, the southern and eastern states, which have better child health, as they have more meat-eaters than northern states. (CNNS 16-18)
- According to study (Shridhar et al., 2014), Indian vegetarian diets were found to have a greater percentage meeting recommended daily allowance (RDA) levels of macro- and micronutrients with less fat and lower calories than nonvegetarian diets.

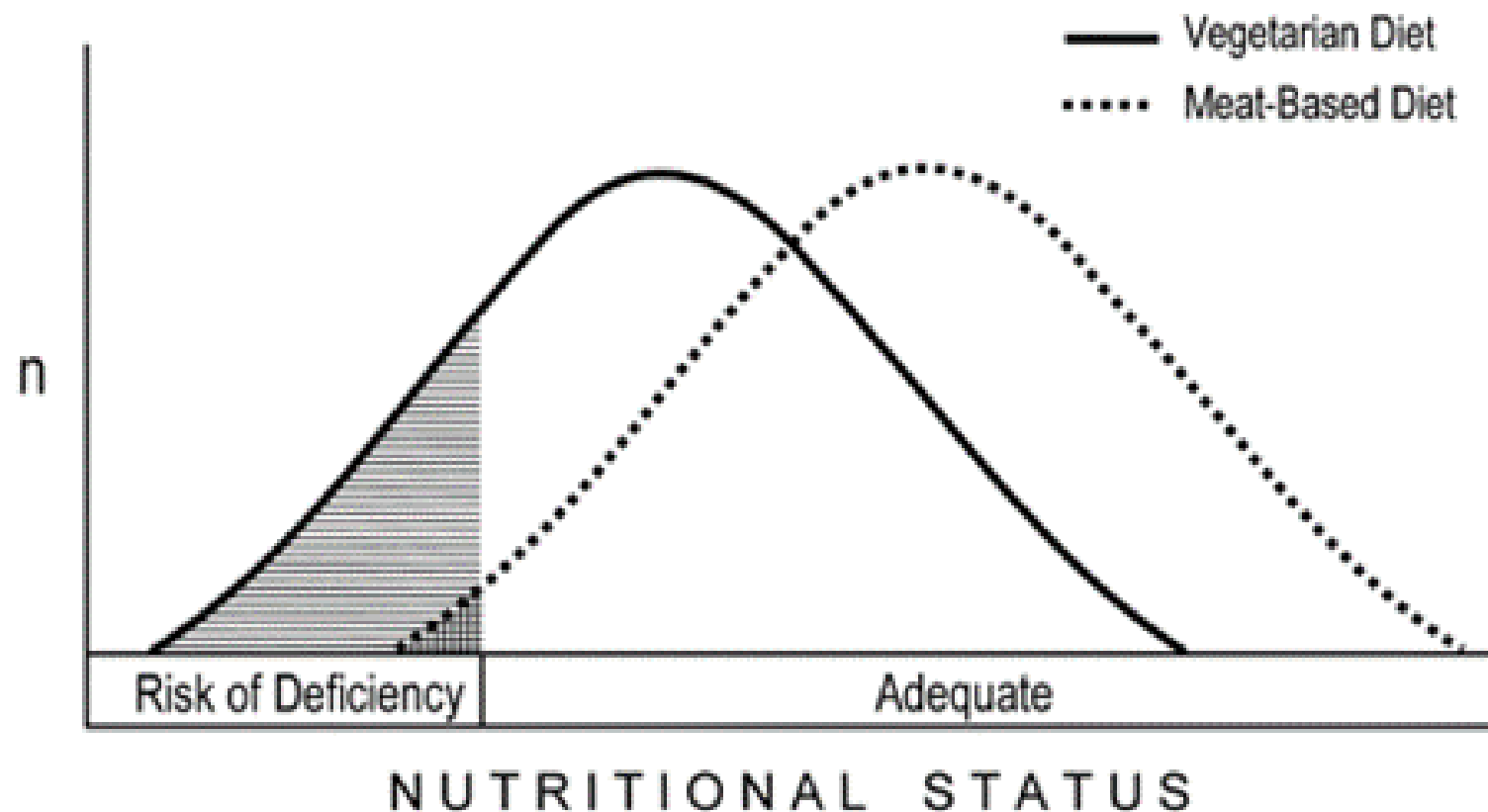


Models on Health risks & benefits of well-balanced diet



EARLY MODEL OF THE ADEQUACY OF VEGETARIAN DIETS

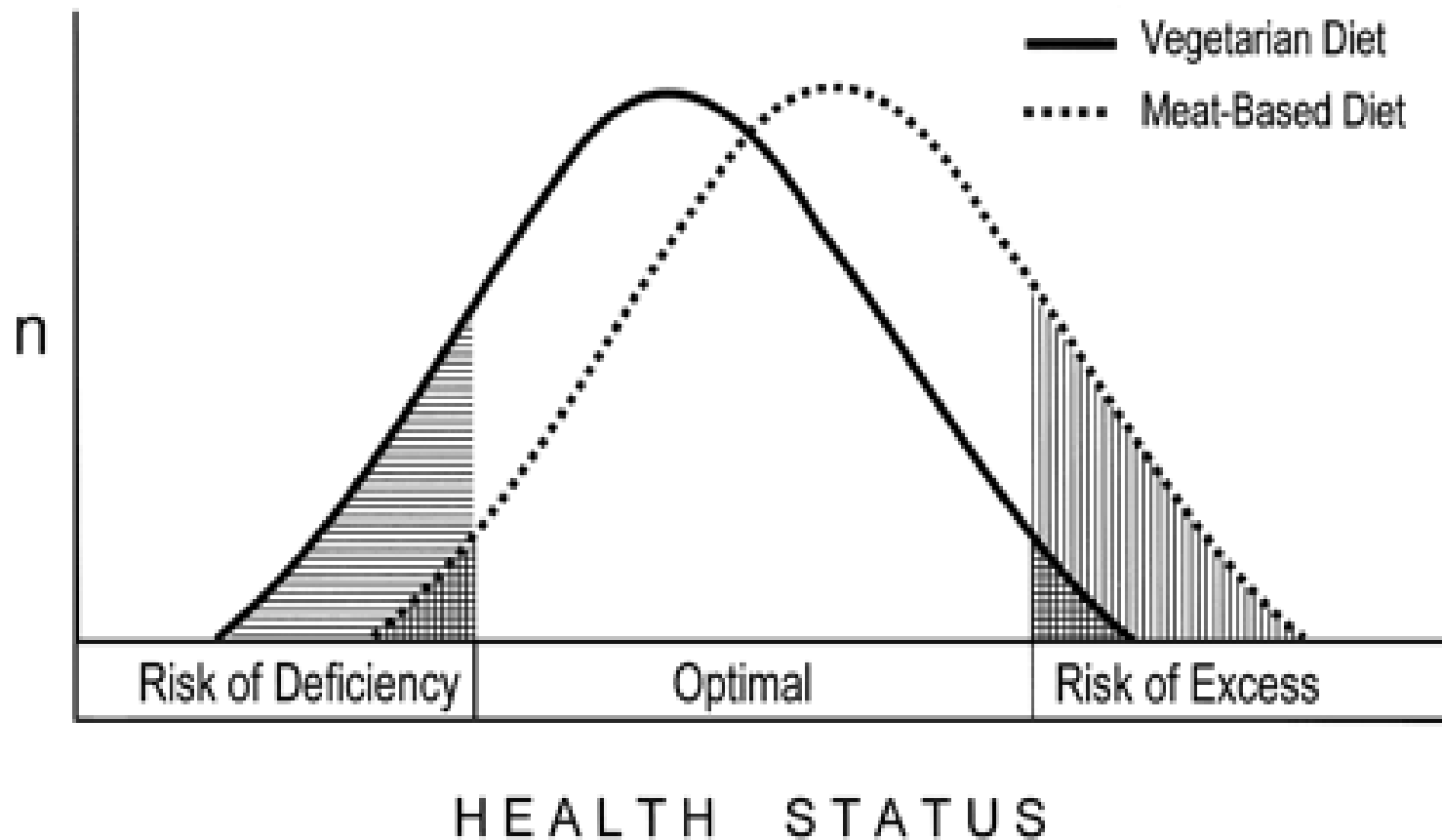
Early model prevailing through the 1960s on the adequacy of vegetarian diets. The area under each curve represents the proportion of individuals in a population for which a given diet may be adequate or deficient ([Sabate J. et al., 2001](#)).





CURRENT MODEL

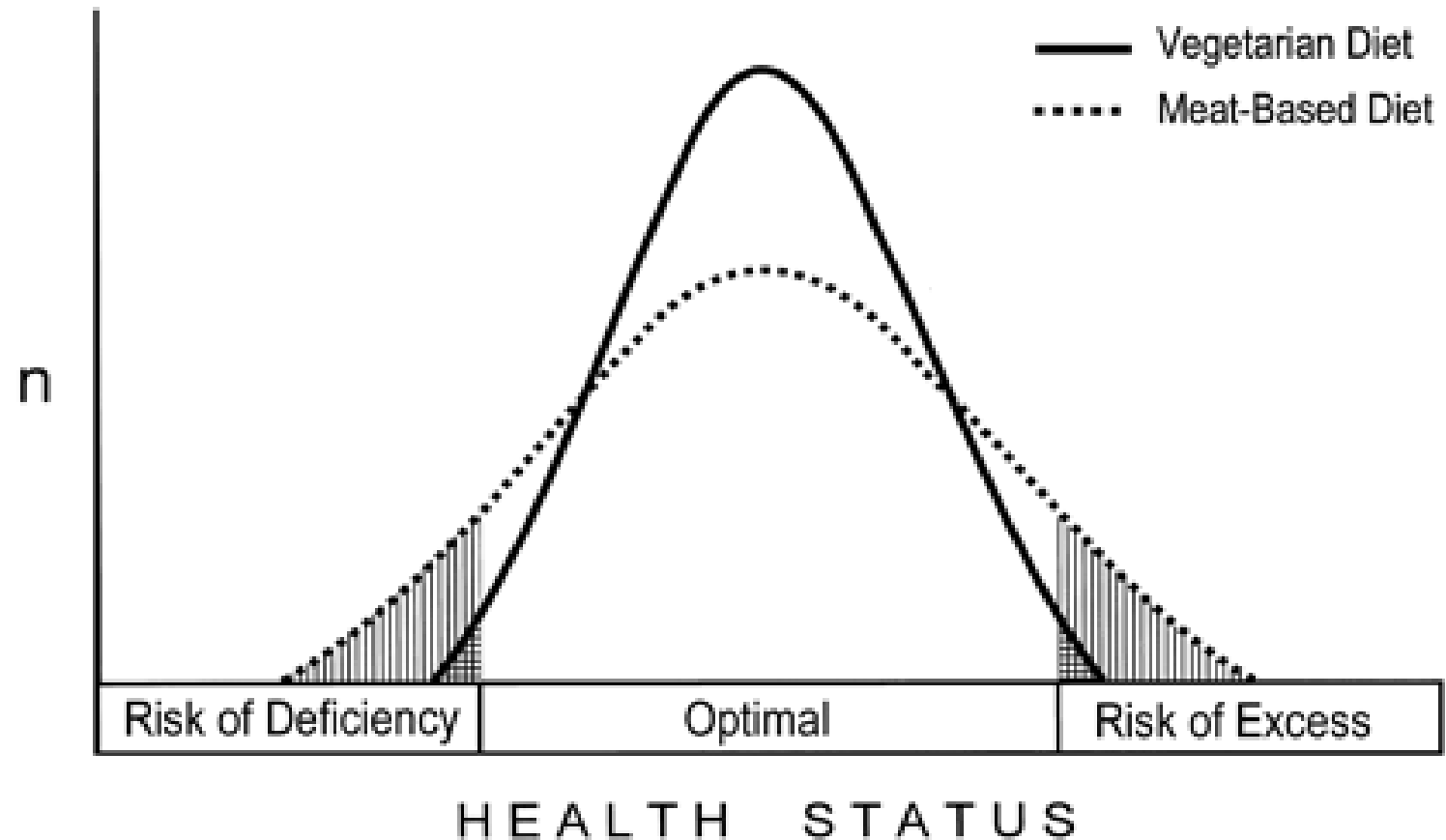
Current model prevailing from the 1970s to the present on the population health risks and benefits of vegetarian and meat-based diets. The area under each curve represents the proportion of individuals in a population for which a given diet pattern may be a health risk or benefit (optimal). At both extremes of the health continuum, there is risk of disease for deficiency or excess of nutrients. The area in the center represents the proportion of individuals for which the diet is optimal or most beneficial ([Sabate J. et al., 2001](#)). .





PROPOSED NEW MODEL

Proposed model on the population health risks and benefits of vegetarian and meat-based diets. The area under each curve represents the proportion of individuals in a population for which a given diet pattern may be a health risk or benefit (optimal). At both extremes of the health continuum, there is risk of disease for deficiency or excess of nutrients or other food compounds. The area in the centre represents the proportion of individuals for which the diet is optimal or most beneficial ([Sabate J. et al., 2001](#)). .





Conclusion

- The beneficial effects of a vegetarian diet significantly outweigh the adverse ones. When a vegetarian diet is appropriately planned and includes fortified foods, it can be nutritionally adequate for adults and children and can promote health and lower the risk of major chronic diseases. It is also clear that the current scenario of food production and consumption, mainly non-vegetarian, is not environmentally sustainable. Hence, there is an urgent need to consume low carbon footprint diet (vegan or vegetarian) that have lower environmental impacts. Environmental issues such as global warming and climate change can be minimized by adopting vegetarianism or by lowering the consumption of meat and other animal-based products. However, considering Indian's protein deficiencies as against the global recommended standard, as well as the poorer health outcomes of its vegetarian population, in India's case it may not yet be the best solution for everyone to become vegetarian. Restrictive or unbalanced diets may lead to nutritional deficiencies, particularly in situations of high metabolic demand (Growing children, pregnant women), in such case nutritionally balanced vegetarian diet or non-vegetarian diet is an important source of protein and other necessary nutrients.



THANK YOU!