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Review Article

A dietitian's perspective on sustainable diets to protect health and environment

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ABSTRACT

Our planet earth has been getting warmer in recent years. Asia accounts for nearly half of global green house gas emissions (GHGEs). It is predicted that by 2050, a large number of regions in Asia will be exposed to deadly levels of GHGEs. It is now time that we recognize the environmental impacts of the type and amount of food we eat considering the planet and our health. It is crucial to address these issues because a growing body of scientific evidence suggests that our dietary habits are putting a lot of strain on the environment. Encountering the recent trends of overconsumption of discretionary foods (foods and beverages not required to provide nutrients the body needs) is key to aligning human and planetary health. Although the undesirable health effects of discretionary foods are an increased risk of obesity and chronic diseases, the environmental and broader sustainability impacts of these food products require more attention, especially since their dietary consumption has been increasing greatly in recent decades, particularly among low-income groups. Therefore, the transition to more sustainable food choices, dietary patterns, and sustainable diets is required to strengthen global efforts to save and decarbonize our planet earth. Adapting to dietary change would require a combination of factors together with nutritional assistance and expertise of the dietetic professionals and lowering the cost price of climate-friendly foods through policies with government and local authorities to enable their affordability and accessibility to the people.

1. Introduction

Sustainable food systems aim to provide adequate and nutritious food while maximizing resource demands as well as negative environmental impacts. Earth's history is divided into a hierarchy of smaller portions of time, referred to as the geologic time scale. Anthropocene epoch is an unofficial unit of geologic time. It is referred to as the most recent period in Earth's history when the human activity started having a notable influence on the planet's climate and ecosystems. It is unstill unclear whether the anthropocene started in the year 1800, with the industrial revolution when human activity created carbon and methane in the atmosphere. In 1945 radioactive particles were first released into the environment when humans tested and dropped the first atomic bombs.[1] Thereafter the load of GHGEs is continuously going on increasing due to uncontrolled various human activities on the planet. In view of the COVID-19 pandemic, there was a brief stall in GHGE in early 2020.[2] Intergovernmental panels on climate change (IPCC) has reported that the average surface temperature of the Earth will cross 1.5 degree Celsius in the next 20 years, and 2 degrees by the middle of the century. It is suggested that the countries in Asia and the Pacific should scale up and accelerate climate action by implementing justified strategies. The dietary choice is a key determinant of both health outcomes and environmental impacts.[3] The global food system is unhealthy not only for humans but also

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for the environment. Therefore following dietary changes have been proposed to accomplish, both environmental and health benefits.

2. Healthful Eating

The modern food systems in the last few decades have tremendously changed our dietary patterns. Trends of global preference for highly processed foods, ready-to-eat foods and fast foods have further made a direct impact on the communities and the environment. The modern dietary trends negatively affect a trio of factors: health, agriculture, and the environment.

Nowadays, the link between dietary choices and carbon footprints is being recognized by more and more people. Dieticians can play a key role in the dissemination of information to the masses regarding attaining a sustainable food system, where food is purchased using techniques that protect the environment, public health, communities, natural ecosystems, and animals is needed. The distinct dietary patterns have markedly different environmental implications. The rice-based agricultural patterns are stated to have greater GHGEs than the wheat-based patterns, principally due to methane emissions from flooded rice crop production. Therefore, traditional regional diets prepared from locally available food ingredients should be encouraged to promote bio-diversity.[4]

3. Soil Conservation

Climate change threatens soil health. The health of the soil is known to be connected with human and planetary health. Soil microbiome survives in soil ecosystems. These soil microbial communities are essential, for the cycling of carbon and other nutrients. Widespread use of inorganic fertilizers and pesticides affects soil ecology. Healthy soils favor soil carbon sequestration, and assist in removing carbon dioxide from the atmosphere and preserving it in a soil carbon pool through plants in form of soil organic carbon. However, the conversion of natural ecosystems to agriculture releases that carbon into the atmosphere. Additionally, reducing tillage, erosion control; organic amendments and cover crops can escalate soil organic carbon.[5,6]

4. Food Choices and Dietary Patterns

Food choices as a part of dietary patterns can make a significant impact on the environment. Scientific research has consistently shown that plant-based dietary patterns are linked with lower environmental impact. Recent research of nine diets aligned with criteria for a healthful diet, specific to 140 countries found that shifts in diets to mostly plants based and low food chain animals such as forage fish, mollusks, and insects is advantageous. It was stated that the vegan diet had the greatest benefit. The next best eco-impact diets were a low food chain, two-thirds vegan, pescatarian, no dairy, no red meat, and vegetarian diet. Reducing the quantity of meat and one meatless day in a week was found to have the lowest advantage.[7]

The research findings further postulate that adopting any one of the common sustainable dietary patterns, ranging from vegan and vegetarian to traditional Mediterranean and New Nordic diets could result in reductions as high as 80% of GHGEs and land use, and 50% of water use. The findings from the Adventist health study and California state agricultural data showed that non-vegetarian diets used 2.9 times more water, 2.5 times more primary energy, 13 times more fertilizer, and 1.4 times more primary energy as compared to vegetarian dietary patterns. The consumption of beef has been documented as the major contributor. The EPIC-Oxford cohort study compared the GHGEs among meat eaters, fish eaters, vegetarians, and vegans in the United Kingdom. The values of carbon dioxide equivalent for vegetarians were 3.81, fish eaters, 3.91, and for low meat eaters were 4.67.[8,9]

According to the EAT-Lancet report, global consumption of fruits, vegetables, nuts, and legumes should be doubled and consumption of foods such as red meat and sugar should be reduced by more than 50%. A diet rich in plant-based foods with fewer animal source foods confers both health and environmental benefits.[10] However, adapting to dietary changes suggested by EAT-Lancet report would require higher income, nutritional assistance, and lower food prices for the diverse global population.[11]

Recently, methionine reduced diets have been associated to longevity in animal studies.[12] Animal sources of protein such as beef, lamb, pork, and eggs contain higher levels of methionine than plant-sourced proteins.[13] However, as methionine is an essential amino acid for humans, the restriction could also increase the risk of deficiency.[12]

5. Integrate Crops and Livestock

Adopting integrated cropping and livestock production allows for better management of nutrient flows by recycling resources. In ecological livestock systems, manure is not a waste but serves as a valuable input that needs to be returned to soils and the crop waste serves as fodder.[14,15]

6. Prefer Plant-Based Proteins

Proteins vary broadly in terms of nutritional profile, digestibility and bioavailability, environmental implications, and consumer acceptance. Pulses are known to be among the most sustainable plant proteins. They are known to have the lowest carbon footprints, are drought tolerant, and enrich the soil through nitrogen-fixing bacteria which reduces the need for fertilizers. Pulses also promote food security in developing countries. It is estimated that the growing of pulses can help increase agricultural products

which will be needed to feed the world by 2050. Animal foods require more energy to produce the same amount of protein than for high protein plant foods such as soy and pulses.[16,17]

7. Reduce Meat Intake

Huge reductions are essential in meat-eating to avoid hazardous climate change. Countries, like the Netherlands, are advocating reducing red meat intake and increasing plant foods.[18] China, which dramatically increased meat consumption (its average intake of 13 kg per person per year in 1982 soared to 63 kg in 2016) along with affluence, has goals in its dietary guidelines to cut meat consumption in half.[19] British Dietetic Association's Environmentally Sustainable Diet (One Blue Dot) recommendations for the United Kingdom call for reducing red meat to less than 71g per person per day, besides avoiding intake of processed meats and choosing high-protein plant foods, such as beans, lentils, soy, nuts, and seeds.[20]

8. Stay away from Discretionary Foods

Discretionary choices are foods or beverages high in saturated fat, added sugars, or salt. Discretionary food consumption is associated with an increased risk of obesity and chronic diseases. Consumption of these foods has increased steeply in high-income countries and the developing world. Eating healthful, nutritious foods, such as whole grains, legumes, vegetables, and fruits, is better for human health and the health of the planet.[21]

9. Do not Waste Food

Food waste is not just a social and humanitarian concern it is also an environmental concern. If wasted food goes to the landfill and rots, it produces methane, a greenhouse gas that is even more potent than carbon dioxide. Today an estimated one-third of all the food produced in the world goes to waste. It could be enough calories to feed each undernourished person on the planet. Minimizing food packaging by skipping single-use, disposable straws, and cups and eating fast food less often is a sustainable strategy.[22]

10. Eat locally and Sustainably

One of the most sustainable things people can do is to grow some food, by planting herbs, edible landscaping, shrubs, and trees in the home and the community. According to the World Watch Institute, food typically travels 1,500 to 2,500 miles from farm to plate. A study in lowa tracked 2,211 miles for one carton of yogurt (milk, sugar, strawberries) to get to the processing plant. In a Swedish study, a typical Swedish breakfast of apple, bread, butter, cheese, coffee, cream, orange juice, and sugar traveled the circumference of the earth to get to the plate.[23] Eating locally produced foods not only create an economy for local producers but are also suitable for the environment.

11. Responsibility of Dietitians

Dietitians are ideal key influencers to promote the importance of sustainable, climate-friendly diets to enable to live healthier lives which in turn would contribute to guarding the future. It is imperative that dieticians join hands globally to take active responsibility for promoting sustainable diets. No group of professionals can have more hands-on opportunities to nourish and promote this change. According to a British Dietetic Association survey, dieticians are dialed into what needs to happen. The association emphasizes four key areas in which dieticians can make a difference:[20]

1. Improving the accessibility of sustainable and more healthful foods through policies with government, local authorities, farmers, local producers, and non-governmental organizations, such as food brands and commercial companies, focusing on under- and postgraduate dietetics training;
2. Making sustainable diets easier to comprehend and taking part in conversations to move us toward consensus; and
3. Ensuring messages are pertinent for different population groups, especially teenagers, and across different cultures.

12. Conclusion

Our daily food choices have an impact not only on our health but also on the climate. The climate change and non-communicable diseases are major global challenges. It is crucial to address these issues. The following points need to be considered to mitigate GHGEs:

1. Sustainable diets should be adapted to mitigate GHGEs, as sustainable diet contributes to low environmental impacts, promotes food system security and leads to healthy life for present and future generations.
2. Environmentally sustainable diet should be based on dietary recommendations of the country.
3. Pulses/legumes consumption should be promoted by reducing selling price. This will increase availability and affordability of pulse to the large segment of population and hence results in low GHGEs.
4. A wide variety of fish should be consumed and a policy on fish can be developed particularly for coastal region.
5. Regional/ state wise flexible options that better align dietary patterns with public health and ecological goals should be adapted.

6. Food waste should be avoided Recycle food waste.
7. Overconsumption of energy and excessive consumption of discretionary foods high in saturated fat, added sugar and salt and/or alcohol. As, in the long term overconsumption of such foods is found to be associated with an increased risk of obesity and chronic diseases and consequently increased carbon footprints.
8. Dietitians can facilitate dietary changes and promotes information about foods which have low GHGEs impact and promotes good health.
9. A recipe booklet can be prepared by dietitians using healthy foods which have lower carbon footprint.
10. Optimizing school meals will also lead to mitigation of GHGEs and promote healthy and sustainable pathway for future generation.
11. To conclude, it is time we recognize the environmental impacts of type and amount of food we eat considering the planet and our health. Therefore, sustainable diet planning should focus on following dietary options.

    (a) Reduce consumption of red meat and avoid processed meats.
    (b) Consume dairy products in moderation.
    (c) Prefer plant proteins such as beans, pulses/legumes, soya, nuts & seeds and whole grains.
    (d) Favor consumption of seasonal and locally available vegetables & fruits. Avoid air-freighted, pre- packaged and prepared fruits and vegetables.
    (e) For hydration opt for tap water.

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14. Conflict of Interest

None.

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