FOOD PRODUCTION, POPULATION DIETARY PATTERNS AND CLIMATE CHANGE

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Background and Aims: Substantial evidence exists linking food production and environmental degradation. Often overlooked is the interconnection between food consumption patterns at the population level and climate change. The aim of this study was to compare the greenhouse gas (GHG) emissions (CO_2, CH_4, and N_2O) from current agricultural operations to produce the foods actually consumed by a health-oriented population of vegetarians and nonvegetarians.
Methods: Food consumption patterns of vegetarians were compared with nonvegetarians by using data from the Adventist Health Study, a cohort of 34,000 California Adventists, of which 45% were vegetarians. Consumption of 10 foods of a 50 food-item questionnaire were significantly different between the two dietary groups. Using primary agricultural data from California and published emission factors, we estimated CO_2 emissions associated with three production inputs: primary energy, pesticides, and fertilizers, utilized to produce each of the ten foods, including the production of the feed given to animals. We also quantified emissions for CH_4 from ruminant digestion and manure handling and storage, and N_2O from crop N fertilization and animal waste management.
Results: Production of the plant foods consumed by the average vegetarian results in greater emissions compared to nonvegetarians: 35 versus 27 Kg of CO_2-eq/yr. Conversely, the per capita consumption of animal foods by vegetarians results in much less emissions compared to nonvegetarians: 19 versus 475 Kg of CO_2-eq/yr. Overall, the per capita difference in annual emissions is 449 Kg of CO_2-eq greater for the nonvegetarian diet.
Conclusions: These findings support the hypothesis that plant-based diets have markedly lower GHG emissions and thus less global warming potential than meat-based diets, although exceptions may occur in relation to some agricultural practices, transportation and processing. Daily food choices of large segments of the population may ultimately result in major impacts on the environment and have public health consequences.