Measurement and Evaluation of Carbon Emission for Different Kinds of Carbohydrate Foods in China

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Abstract

The food system significantly contributes to global carbon emissions, which has attracted attention of researchers. Carbohydrate-rich (CR) foods as very important components of Chinese traditional foods, are the most important energy sources for human body. In this study, carbon emissions of twenty types of CR foods including grains, beans, and tubers food during cultivation, processing, and transportation phase were investigated according to the LCA (life cycle assessment) principle. The present research showed that different food types showed significantly various environmental influences. The carbon emissions produced by the foods were evaluated based on different function units (mass, food-supplying energy and nutritional values based on specific nutrition profiling models). The rankings of foods according to carbon emission per unit mass were similar to those using the energy as function unit. However, when nutrition values based on specific five or twenty-one nutrient contents were used as the function unit, the rankings varied. It implied that comprehensive evaluation of food function was important for more accurately illustrating the impacts of consumption choice to different CR foods on the environment. In summary, the results revealed that consumption of more wheatberry and standard wheat flour could be a feasible plan to reduce carbon emissions in Chinese society in nowadays. Meanwhile, the increase in consumption of corn kernels, sweet potato, and potato instead of rice-based foods or tailored flour (grade one) could cut a considerable amount of carbon emissions further in future.