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Health and Greenhouse Gas Emission Implications of Reducing Meat Intakes in Hong Kong

Authors : Cynthia Sau Chun Yip, Richard Fielding

Abstract : High meat and especially red meat intakes are significantly and positively associated with a multiple burden of diseases and also high greenhouse gas (GHG) emissions. This study investigated population meat intake patterns in Hong Kong. It quantified the burden of disease and GHG emission outcomes by modeling to adjust Hong Kong population meat intakes to recommended healthy levels. It compared age- and sex-specific population meat, fruit and vegetable intakes obtained from a population survey among adults aged 20 years and over in Hong Kong in 2005-2007, against intake recommendations suggested in the Modelling System to Inform the Revision of the Australian Guide to Healthy Eating (AGHE-2011-MS) technical document. This study found that meat and meat alternatives, especially red meat intakes among Hong Kong males aged 20+ years and over are significantly higher than recommended. Red meat intakes among females aged 50-69 years and other meat and alternatives intakes among aged 20-59 years are also higher than recommended. Taking the 2005-07 age- and sex-specific population meat intake as baselines, three counterfactual scenarios of adjusting Hong Kong adult population meat intakes to AGHE-2011-MS and Pre-2011 AGHE recommendations by the year 2030 were established. Consequent energy intake gaps were substituted with additional legume, fruit and vegetable intakes. To quantify the consequent GHG emission outcomes associated with Hong Kong meat intakes, Cradle-to-ready-to-eat lifecycle assessment emission outcome modelling was used. Comparative risk assessment of burden of disease model was used to quantify the health outcomes. This study found adjusting meat intakes to recommended levels could reduce Hong Kong GHG emission by 17%-44% when compared against baseline meat intake emissions, and prevent 2,519 to 7,012 premature deaths in males and 53 to 1,342 in females, as well as multiple burden of diseases when compared to the baseline meat intake scenario. Comparing lump sum meat intake reduction and outcome measures across the entire population, and using emission factors, and relative risks from individual studies in previous co-benefit studies, this study used age- and sex-specific input and output measures, emission factors and relative risks obtained from high quality meta-analysis and meta-review respectively, and has taken government dietary recommendations into account. Hence evaluations in this study are of better quality and more reflective of real life practices. Further to previous co-benefit studies, this study pinpointed age- and sex-specific population and meat-type-specific intervention points and leverages. When compared with similar studies in Australia, this study also showed that intervention points and leverages among populations in different geographic and cultural background could be different, and that globalization also globalizes meat consumption emission effects. More regional and cultural specific evaluations are recommended to promote more sustainable meat consumption and enhance global food security.

Keywords : burden of diseases, greenhouse gas emissions, Hong Kong diet, sustainable meat consumption
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