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Assessing the environmental impact of food consumption in Northern Ireland, a focus on greenhouse gas emissions

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There is evidence that human health and environmental sustainability are linked⁽¹⁾ and a shift to more sustainable diets would be beneficial for both human and planetary health⁽²⁾. Greenhouse gas emissions (GHGe) are an environmental metric that can be used to assess the environmental impact of diets⁽³⁾. Research indicates that a nutritionally adequate diet low in GHGe can be achieved, but that a healthy diet will not always result in lower GHGe⁽⁴⁾. To date, there is no information on the food choices driving GHGe in Northern Ireland. This study examined the food groups and derived nutrient intakes driving GHGe for Northern Ireland.

Analyses were performed on the Northern Ireland sub cohort of the UK National Dietary Nutrition

Survey (NDNS 2016–2019)⁽⁵⁾ on adults aged 18–64 years old (n = 210). GHGe were sourced from Scheelbeek et al. 2020⁽⁶⁾. Mean daily intakes (MDI) for nutrients and GHGe for the total population were calculated and the population was divided into tertile groups based on low (T1), medium (T2) and high (T3) GHGe. Differences in population characteristics, MDI of energy and key nutrients (%TE or per 10MJ) and contributing food sources to GHGe were examined across these tertiles, using chi-square and one-way ANOVA with covariates (blue water use, sex and social class) and correcting for multiple comparisons as appropriate (P<0.0011 for food groups and P<0.002 for nutrients).

Mean GHGe for adults were 4.3 ± 1.9 kgC02eq/d and 7% of the population fell below the GHGe planetary boundary of 1.87 kgC02eq/d⁽⁷⁾. The food groups 'tea, coffee and water' (0.80 ± 0.56 kgC02eq/d), 'burgers, sausages, kebabs, meat pies and other meat and meat products' (0.39 ± 0.64 kgC02eq/d) and 'alcoholic beverages' (0.39 ± 1.02 kgC02eq/d) were the major contributors to overall GHGe. Across the tertiles, the difference of GHGe between T3 and T1 was 3.6 kgC02eq/d (6.3 kgC02eq/d vs 2.7 kgC02eq/d). The contribution of 'bacon, ham and dishes', 'beef, veal and dishes', 'lamb and lamb dishes', 'tea, coffee and water' and 'alcoholic beverages' were higher (P<0.001) in T3 versus T1. MDI of energy (kcal) was higher in T3 versus T2 and T1 (2141.3kcal, 1791.2kcal and 1368.9kcal, P<0.001). Significantly lower carbohydrate (%TE) intakes were reported in T3 compared to T1 (42.7%TE vs 47.5%TE, P<0.001). Protein and fat (%TE) were higher in T3 in comparison to T2 and T1, with protein at 17.4%, 17.1% and 16.7%TE respectively, and fat at 35.4%, 35.3% and 33.7%TE respectively.

In summary, the main food groups driving GHGe in NI were beverage and animal based.

Differences in energy and carbohydrate intake were observed across the tertiles. These results will aid in the development of strategies to diversify foods within Northern Ireland to combat high GHGe.

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