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| **Title of Research Presentation** Achieving healthy and sustainable diets: A review of recent studies using optimisation modelling |
| **Background/Objectives**For climate protection and other environmental concerns it is becoming critical that diets and agriculture systems become more sustainable. Tools such as mathematical optimisation techniques (eg, linear programming) can assist in identifying dietary patterns that both improve nutrition and reduce environmental impacts. We aimed to identify such studies and critically examine their findings.**Methods**Literature search for recent studies in which optimisation was used to achieve nutrition and environmental sustainability aims.**Results**A total of 12 recent studies were identified. These used data from China, India, Tunisia and from seven high-income countries (France [n=3 studies], Finland, Italy, Netherlands [n=3], Sweden, United Kingdom [n=3], and the United States). Most studies aimed to reduce greenhouse gas emissions (10/12) and half aimed to also reduce at least one other environmental impact eg, water use, fossil energy use, land use, marine eutrophication, atmospheric acidification, and nitrogen release. The main findings were that in all 12 studies the diets optimised for sustainability and nutrition were more plant-based with reductions in meat – particularly ruminant meats such as beef and lamb (albeit with 6/12 of studies involving increased fish in diets). The amount of dairy products also tended to decrease in most (7/12) of the studies with more optimised diets. Other foods that tended to be reduced included: sweet foods (biscuits, cakes and desserts), savoury snacks, white bread, and beverages (alcoholic and soda drinks). These findings were broadly compatible with the findings of seven out of eight recent review articles on the sustainability of diets. The literature is suggestive that healthy and sustainable diets may typically be cost neutral or cost-saving, but this is still not clear overall.**Conclusions**The main findings were that in all studies the diets optimised for sustainability and nutrition were more plant-based with reductions in ruminant meats. However, there remains scope for improvement in such areas as: sustainability metrics for food production and consumption; consideration of infectious disease risks from livestock agriculture and meat; and research on the sustainability impact of existing/hypothetical nutritional interventions (eg, impact of Mexico’s junk food and soda taxes; and hypothetical taxes on meat).**Keywords**Dietary patternsSustainabilityGreenhouse gas emissionsWater use  |