Behavioral science models can help identify the greenest dietary changes

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Spreading the gospel of veggie-only diets may not be the most effective way to help reduce overall, food-related greenhouse gas emissions, according to a new model based on behavioral science.

In new commentary published Aug. 9 in *Nature Sustainability*, Jonathan Gilligan, associate professor of Earth and Environmental Sciences, examines the importance of including realistic examples of human behavior in computer models that measure human impacts on climate change.

Gilligan's commentary focuses on a new report by Sibel Eker and her colleagues at the International Institute for Applied Systems Analysis in Austria, which also appears in the Aug. 9 edition of *Nature Sustainability*, on a new model that uses behavioral science to study the impact of diet on climate change. Eker's paper focuses on adoption of vegetarian or vegan diets, but surprisingly finds that reducing the amount and kind of meat that meat-eaters consume has a greater impact on the climate than increasing the number of people with strict vegetarians or vegans.

In his article, "Modeling Diet Choices," Gilligan notes that, while a reduction in red meat consumption is a well-known catalyst for reducing greenhouse emissions, researchers and policy makers don't always know the best way to encourage Americans to actually eat less red meat.

Gilligan's commentary draws on his previous research with Michael Vandenbergh, the David Daniels Allen Distinguished Chair of Law at Vanderbilt. Working with a team of social and behavioral scientists, the duo pioneered an approach to analyzing the environmental impact of environmental policies by accounting for the fact that some policies are more effective than others at persuading people to change their behavior.

Integrated assessment models (IAMs) are widely used to assess climate policies, and Gilligan argues that incorporating behavioral science into these models is essential for properly examining and comparing policy scenarios in order to determine which approaches are the greenest.

Eker's model does this by connecting diet, land-use and greenhouse gas

emissions, and using the psychological theories of Planned Behavior and Protection Motivation to describe the dual considerations people bring to the choice whether to eat meat: risk to personal health, and risk to the climate. As Gilligan mentions in his commentary, this model's approach is a great way to not only gauge which dietary changes are the greenest, but also understand what drives consumers to adopt those changes.

Eker and her colleagues used their model to show that if meat eaters adopt a flexitarian diet, in which they still eat meat but in reduced quantities, and only a few people become strict vegetarian, the harm to the environment will be less than a scenario in which half the population becomes vegetarian but the remaining meat eaters continue to eat large amounts of red meat. In other words, it makes a greater difference for large numbers of meat eaters to reduce their red meat consumption than for a much smaller number to become strict vegetarians.

Gilligan points out that this is good news for policymakers because dietary trends in the United States have already been shifting toward less red meat and more chicken. Additional research using models that incorporate behavioral science will help identify better strategies to reduce the contribution of American diets to climate change while also improving public health.

More information: Jonathan M. Gilligan. Modelling diet choices, *Nature Sustainability* (2019). DOI: 10.1038/s41893-019-0354-7

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