

Agent-based modeling of dietary change in the Netherlands

Scenario exploration and model development

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Project description

Dietary change is widely recognized as an important part of reducing greenhouse gas emissions and remaining within planetary boundaries.¹ While plant-based diets are becoming more common in the Netherlands, especially as costs of living increase,² strategies are still needed to facilitate people switching to more sustainable and healthy diets. As part of the NWO project 'Transition to a Sustainable Food System,' an agent-based model was developed to simulate consumers making dietary decisions.³ In the model, agents (representing individual consumers) choose between several baskets of goods, or stylized diets, based on personal preferences, perceptions of each diet, and household-level constraints around cost. Consumers can also share their preferences to influence each other's decision-making. So far, a sensitivity analysis has been performed on the model, and it has been used to explore a very simple scenario of how changing food prices could affect dietary decisions.

In this strand of research, you would change model parameterization to explore further scenarios and understand what interventions (e.g. pricing, information sharing) may be most successful in prompting dietary change.

All models are necessarily simplifications, and there is a trade-off between realism and tractability of analysis. However, this model is still quite simple, and therefore could also be expanded or changed to explore different aspects of dietary transitions, such as social versus non-social information sharing and use, effects of the food environment, and intra-household decision-making dynamics, among others. While there are many interesting scenarios that could be explored using the current version of the model or with minimal changes, if you are interesting in working with the code more to change the model (and then also re-run the sensitivity analysis if needed), that is also an option.

Job requirements

- Knowledge of agent-based modeling concepts and fundamentals
- Experience with programming – the model is in Netlogo, but experience with other programming languages (e.g. Java, Python) would be acceptable as well, as long as you are comfortable with reading (and possibly writing) code and running simulations
- Knowledge of R or Python for data analysis (very helpful but not absolutely required)

¹ Springmann *et al.* (2018) <https://www.nature.com/articles/s41586-018-0594-0>

² <https://www.cbs.nl/nl-nl/nieuws/2021/23/vlees-geen-dagelijkse-kost-voor-8-op-de-10-nederlanders>

³ Davis *et al.* (in press) – preprint available upon request