Authors:
Millie Selvig-Larsen millie@live.no[1], Elena Virciglio elena.virciglio@unipa.it[12], Marie Halland marie.halland@student.uib.no[1]
[1]Department of Geography, University of Bergen, Norway
[2]Department of Political Sciences and International Relations, University of Palermo, Italy

Unpacking the Dynamics of the Stagnant Adoption of Meat Alternatives in Norway

The adoption of meat alternatives in Norway remains persistently low despite increasing product availability and growing policy attention. This study develops a system dynamics model to investigate the feedback mechanisms that sustain this stagnation and to identify policy leverage points capable of triggering self-sustaining diffusion. Building on a Bass diffusion structure, the model incorporates stocks representing potential adopters, individuals considering adoption, adopters, and a dedicated skepticism stock that captures resistance driven by perceived taste, price attractiveness, and rejection dynamics. Calibration against Norwegian data from 2000–2020 reveals that reinforcing loops related to word-of-mouth, price, and taste attractiveness are insufficient to overcome the balancing effect of skepticism under current conditions.

Policy experiments evaluate a government-funded program introducing regular plant-based lunches in public schools. Simulation results show that modest implementation (10% of schools) produces limited change, while a more ambitious rollout (30%) substantially reduces skepticism and strengthens social normalization, enabling word-of-mouth to generate accelerating adoption. Under this scenario, diffusion approaches a tipping point where innovation and imitation effects become mutually reinforcing.

The findings highlight skepticism as a structural barrier that prevents diffusion from unfolding naturally, and demonstrate that targeted, structural interventions, rather than information campaigns alone, are necessary to shift dietary norms. Future work should segment the population by socioeconomic characteristics and endogenize price dynamics to refine policy design.

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A system dynamics study of feedbacks, skepticism, and public policy

Food choices affect public health, land use, and climate. Consumption of meat alternatives can be central to sustainable food systems, yet adoption in Norway remains low.

This study develops a system dynamics model to explain this stagnation and uses policy scenarios to explore leverage points identified within the model.

Research Question: What feedback mechanisms explain the stagnation in the adoption of meat alternatives in Norway?

Causal Loop Diagram

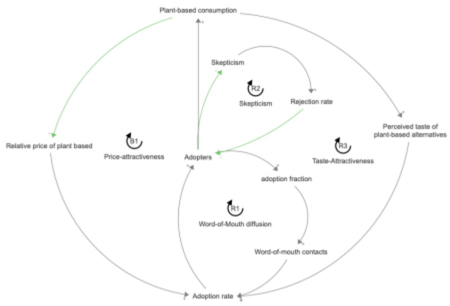

Figure 1. Causal loop diagram showing the main reinforcing loops (R1–R3) and balancing loop (B1) shaping the adoption dynamics of meat alternatives in Norway.

Policy to Normalize Adoption

The study evaluates a government-funded policy in which public schools regularly serve plant-based lunches. The goal is to increase familiarity through repeated exposure.

Two scenarios are tested starting in 2028. Full implementation is assumed to raise the adoption rate to 0.3 per year.

The effect is mainly driven by stronger word-of-mouth and lower skepticism effects, while taste remains largely unchanged.

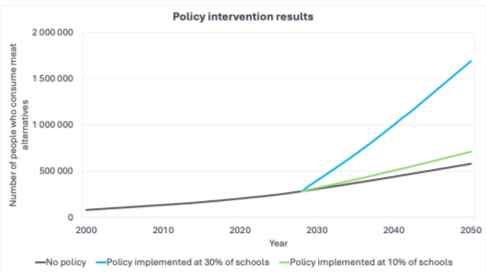

Figure 2. Simulated impact of a Norwegian school-lunch policy on plant-based adoption from 2028 to 2050. The 30% implementation scenario produces the strongest growth by 2050.

Goal

This study uses system dynamics to examine why adoption of meat alternatives in Norway remains slow despite growing availability, and under what conditions diffusion can become self-sustaining.

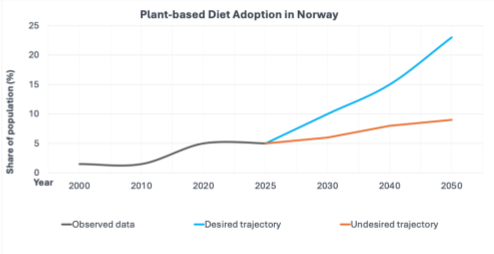

Figure 3. Reference mode showing observed and desired trajectories for plant-based diet adoption in Norway.

Method

- **Bass diffusion structure:** We developed a system dynamics model based on Bass diffusion, with stocks representing potential adopters, those considering adoption, and adopters. A skepticism stock was added to capture resistance to adoption.
- **Literature review and calibration:** The model was informed by an extensive literature review and calibrated against Norwegian data from 2000 to 2020.
- **Policy testing:** The model was used to test school-lunch policies introducing free plant-based meals in 300 or 1000 schools per year from 2028 to 2050.

Results

Word-of-mouth generates strong growth only when plant-based products are affordable, tasty, and socially normalized, and when skepticism is moderate.

The model shows that innovation and imitation become effective only under these conditions. In that case, word of mouth and everyday product experience create reinforcing feedback loops that accelerate adoption, while skepticism declines.

Next Steps

- The model is deliberately small and leaves questions open for future research.
- The Norwegian population is treated as homogeneous. Future work could segment the population by economic constraints and baseline skepticism to test policies tailored to these groups.

Conclusion

Diffusion stalls when price, taste, and skepticism reinforce one another. Targeted policy interventions can break this pattern and accelerate adoption.

Scan for references:

Millie Selvig-Larsen[1], Elena Virciglio[2], Marie Halland[1]

[1]*Department of Geography, University of Bergen, Norway*

[2]*Department of Political Sciences and International Relations, University of Palermo, Italy*

Contact information:

millie@live.no, elena.virciglio@unipa.it, marie.halland@student.uib.no

INTERNATIONAL SYSTEM DYNAMICS CONFERENCE ISDC

UNIVERSITY OF BERGEN