# Appendix 1. Methodology for review of modelling studies on the impact of reducing meat and dairy on nutrient intake, chronic diseases, and mortality

PubMed was searched on 12 April 2023 using the terms: "model\*" AND ("meat" or "dairy") AND "reduction". A total of 743 studies were imported into Covidence software for title/abstract screening. The reference lists of included studies were also reviewed. Studies that focused on reductions in meat and/or dairy were included. Studies that evaluated whole-diet shifts, for example, Danish diets shifting to match EAT-*Lancet* recommendations (Lassen, Christensen, and Trolle 2020) were excluded. Studies that identified a nutritionally adequate diet that minimised greenhouse gas emissions, i.e., diet optimisation studies (Ferrari et al. 2020; Kesse-Guyot et al. 2021; Salomé et al. 2023; Dussiot, Fouillet, Perraud, et al. 2022; Dussiot, Fouillet, Wang, et al. 2022; Eini-Zinab, Sobhani, and Rezazadeh 2021; Verly-Jr et al. 2022) were also excluded as it was not possible to isolate the effects of reducing meat and/or dairy.

The following studies were identified:

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| **First Author** | **Year** | **Location** | **Outcome(s)** |
| **Modelling impact on nutrient intake** | | | |
| Springmann | 2018 | Global | Nutrient intake, premature mortality |
| Farsi | 2022 | UK | Nutrient intake |
| Gazan | 2021 | France | Nutrient intake |
| Salomé | 2021 | France | Nutrient intake |
| Temme | 2013 | The Netherlands | Saturated fat and iron intake |
| Temme | 2015 | The Netherlands | Nutrient intake |
| **Modelling impact on chronic diseases and mortality** | | | |
| Springmann | 2018 | Global | Nutrient intake, premature mortality |
| Zec | 2019 | Europe (UK, The Netherlands, Sweden, Spain, Norway, Italy, Greece, Germany, France and Denmark) | Colorectal cancer |
| Milner | 2023 | England and Wales | Mortality |
| Vandenberghe | 2018 | Belgium | Disability adjusted life years (DALY) |
| Lourenço | 2018 | Denmark | Colorectal cancer |
| Schönbach | 2019 | Germany | Colorectal cancer, ischaemic heart disease, type 2 diabetes |
| Tönnies | 2021 | Germany | Type 2 diabetes |
| De Oliveira Mota | 2021 | France | Disability adjusted life years (DALY) |

Dussiot, Alison, Hélène Fouillet, Elie Perraud, Marion Salomé, Jean-François Huneau, Emmanuelle Kesse-Guyot, and François Mariotti. 2022. ‘Nutritional Issues and Dietary Levers during Gradual Meat Reduction - A Sequential Diet Optimization Study to Achieve Progressively Healthier Diets’. *Clinical Nutrition (Edinburgh, Scotland)* 41 (12): 2597–2606. https://doi.org/10.1016/j.clnu.2022.09.017.

Dussiot, Alison, Hélène Fouillet, Juhui Wang, Marion Salomé, Jean-François Huneau, Emmanuelle Kesse-Guyot, and François Mariotti. 2022. ‘Modeled Healthy Eating Patterns Are Largely Constrained by Currently Estimated Requirements for Bioavailable Iron and Zinc-a Diet Optimization Study in French Adults’. *The American Journal of Clinical Nutrition* 115 (3): 958–69. https://doi.org/10.1093/ajcn/nqab373.

Eini-Zinab, Hassan, Seyyed Reza Sobhani, and Arezoo Rezazadeh. 2021. ‘Designing a Healthy, Low-Cost and Environmentally Sustainable Food Basket: An Optimisation Study’. *Public Health Nutrition* 24 (7): 1952–61. https://doi.org/10.1017/S1368980020003729.

Ferrari, Marika, Luca Benvenuti, Laura Rossi, Alberto De Santis, Stefania Sette, Deborah Martone, Raffaela Piccinelli, Cinzia Le Donne, Catherine Leclercq, and Aida Turrini. 2020. ‘Could Dietary Goals and Climate Change Mitigation Be Achieved Through Optimized Diet? The Experience of Modeling the National Food Consumption Data in Italy’. *Frontiers in Nutrition* 7. https://www.frontiersin.org/articles/10.3389/fnut.2020.00048.

Kesse-Guyot, Emmanuelle, Hélène Fouillet, Julia Baudry, Alison Dussiot, Brigitte Langevin, Benjamin Allès, Pauline Rebouillat, et al. 2021. ‘Halving Food-Related Greenhouse Gas Emissions Can Be Achieved by Redistributing Meat Consumption: Progressive Optimization Results of the NutriNet-Santé Cohort’. *The Science of the Total Environment* 789 (October): 147901. https://doi.org/10.1016/j.scitotenv.2021.147901.

Lassen, Anne D., Lene M. Christensen, and Ellen Trolle. 2020. ‘Development of a Danish Adapted Healthy Plant-Based Diet Based on the EAT-Lancet Reference Diet’. *Nutrients* 12 (3): 738. https://doi.org/10.3390/nu12030738.

Salomé, Marion, François Mariotti, Alison Dussiot, Emmanuelle Kesse-Guyot, Jean-François Huneau, and Hélène Fouillet. 2023. ‘Plant-Based Meat Substitutes Are Useful for Healthier Dietary Patterns When Adequately Formulated - an Optimization Study in French Adults (INCA3)’. *European Journal of Nutrition*, March. https://doi.org/10.1007/s00394-023-03117-9.

Verly-Jr, Eliseu, Aline Martins de Carvalho, Dirce Maria Lobo Marchioni, and Nicole Darmon. 2022. ‘The Cost of Eating More Sustainable Diets: A Nutritional and Environmental Diet Optimisation Study’. *Global Public Health* 17 (6): 1073–86. https://doi.org/10.1080/17441692.2021.1900315.