
Supporting Information for:

A Review of Environmental Life Cycle Assessments of Diets: Plant-Based Solutions Are Truly Sustainable, Even in the Form of Fast Foods

Anna Kustar and Dalia Patino-Echeverri *

Nicholas School of the Environment, Duke University, Durham, NC 27708, USA; anna.kustar@duke.edu

* Correspondence: dalia.patino@duke.edu

We searched for journal articles that reported quantitative differences in the life cycle impacts of vegetarian and vegan diets relative to comparable omnivore diets. We focused on studies reporting at least one of three impact categories: greenhouse gas emissions, land use, and water use, for vegetarian and/or vegan diets relative to conventional western diets with the same caloric and protein content. First, we conducted a search using the Web of Science database and retrieved 30 studies. An additional search on Google Scholar yielded one more article. A summary of the search protocols is presented in Figure S1 and Figure S2. All articles were screened independently by the two authors.

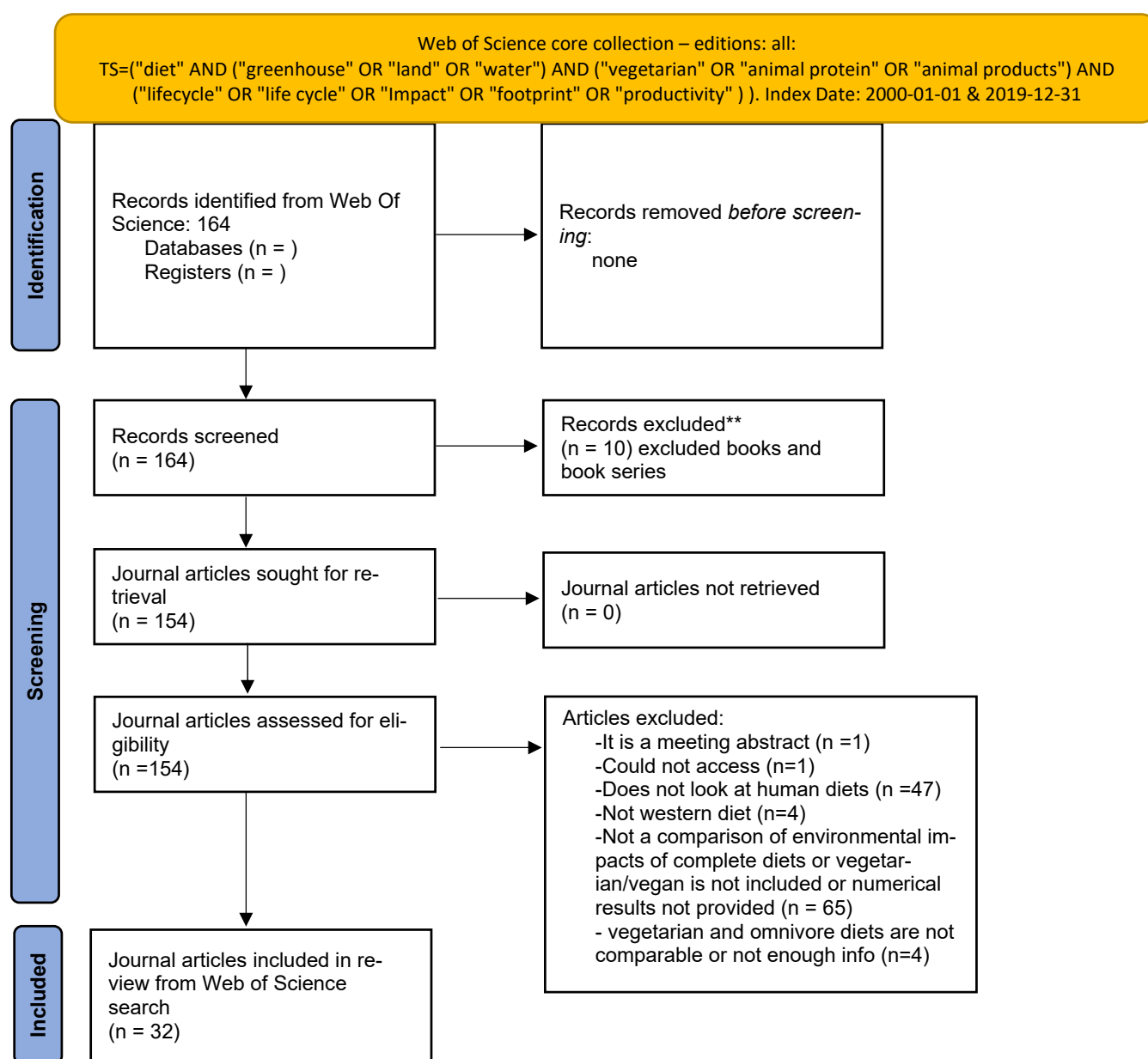


Figure S1. Search of articles included in Table 1 and Figures 2 and 3 in the manuscript. This search was followed with a search on Google Scholar (see Figure S2), which resulted in one additional journal article, and the addition of one more article published in February of 2020. The flow chart has been adapted from [1].

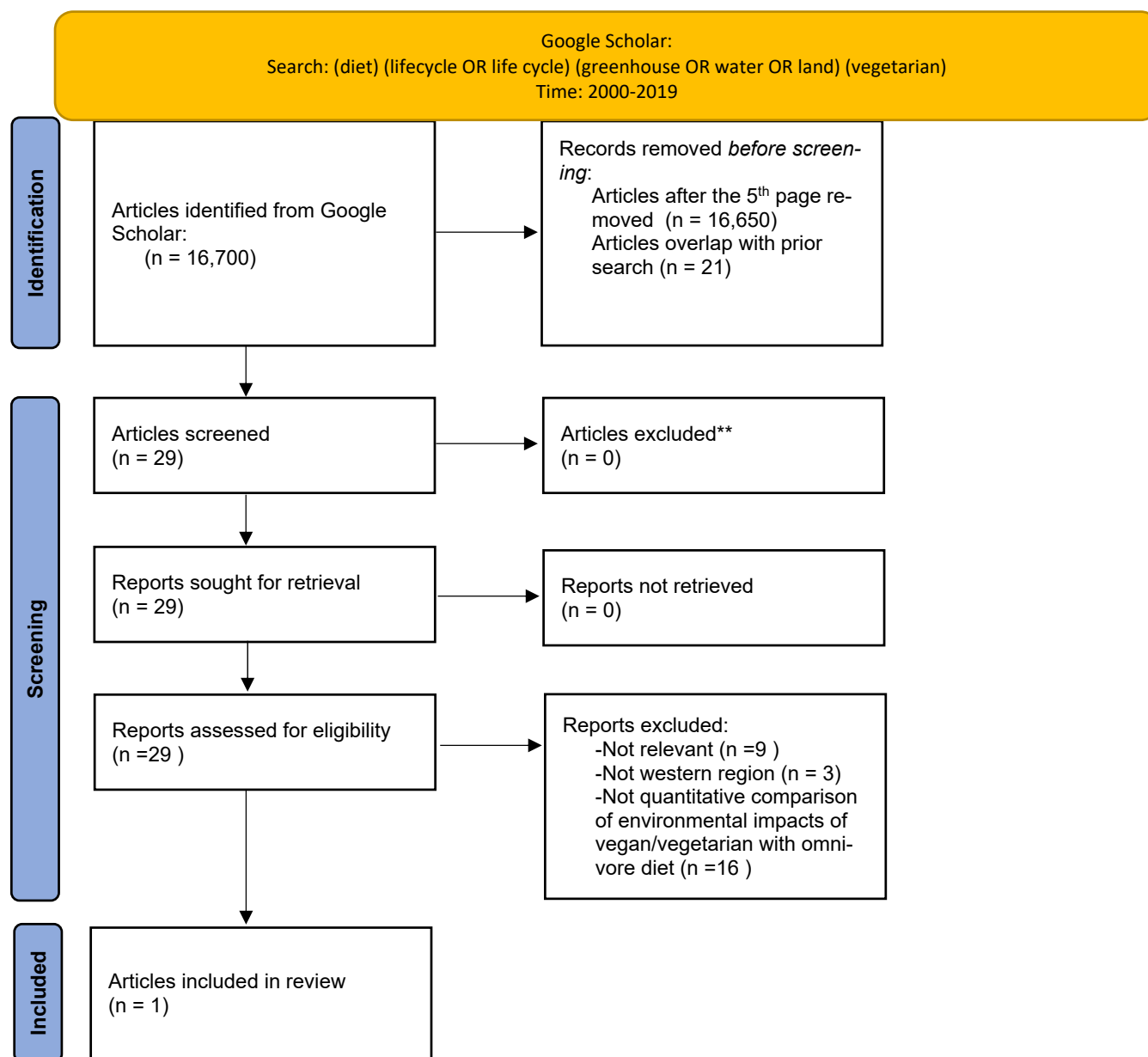


Figure S2. Search on Google Scholar for the articles summarized in Table 1 and Figures 2 and 3 in the manuscript. This was a complementary search to the search on Web of Science reported in Figure S1. The flow chart format has been adapted from [1].

Differences between recommended and observed diet

While the proportions of different food groups are similar for the recommended three types of diets (vegan, vegetarian, and omnivore), there is a great discrepancy between the modeled diets and those followed by most people as shown below:

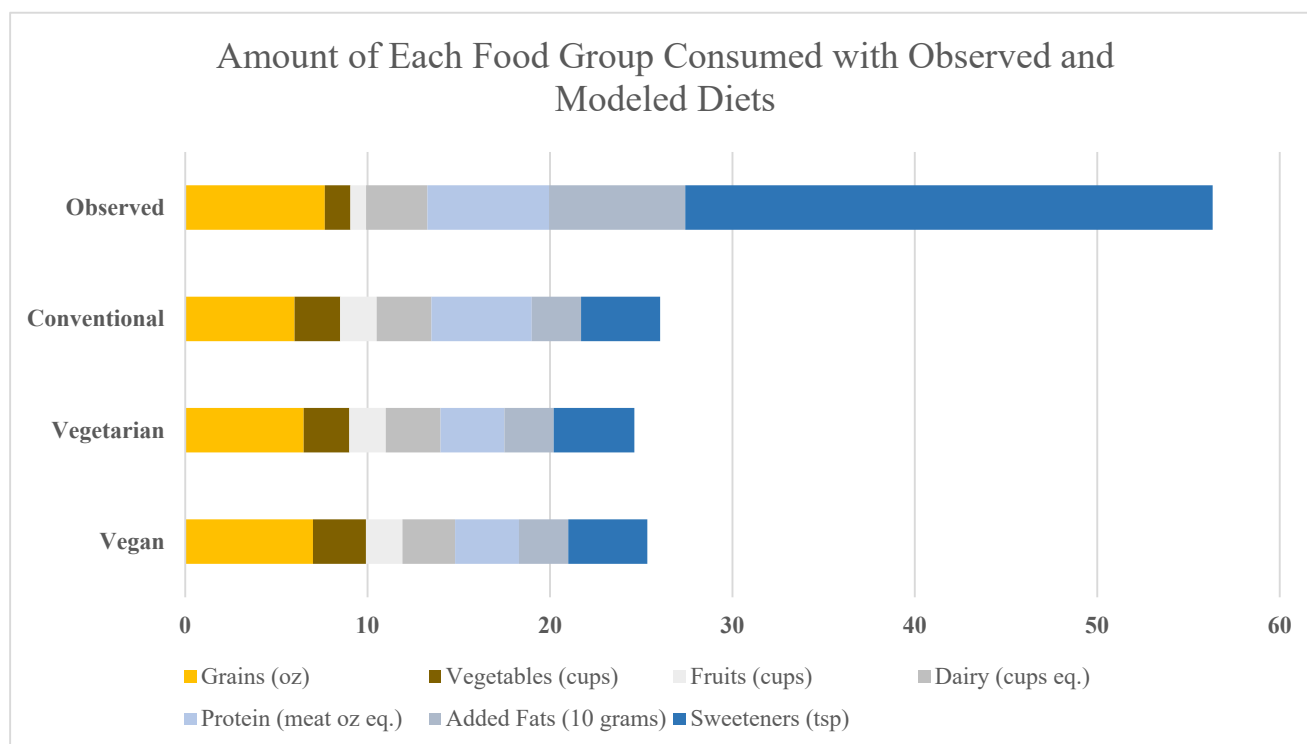


Figure S3. An example of how an observed diet compares to three modeled healthy diets. Each modeled diet obtains a similar nutritional content from food groups; therefore, any difference in environmental impacts is attributed to the type of food consumed and not a reduction in health or calories. However, the modeled diets are not reflective of people's eating habits; the observed diet consists of less fruit and vegetables and more added fats and sweeteners than a recommended diet. Depicted dietary recommendations for 2000 calorie diets were obtained from [2], and the characteristics of the observed diet were obtained from [3]. The USDA defines 1 cup dairy eq. as 1 cup milk, yogurt, or fortified soy milk; 1½ ounces natural cheese such as cheddar cheese or 2 ounces of processed cheese.

Graphical results of plant-based on conventional burgers' environmental impacts:

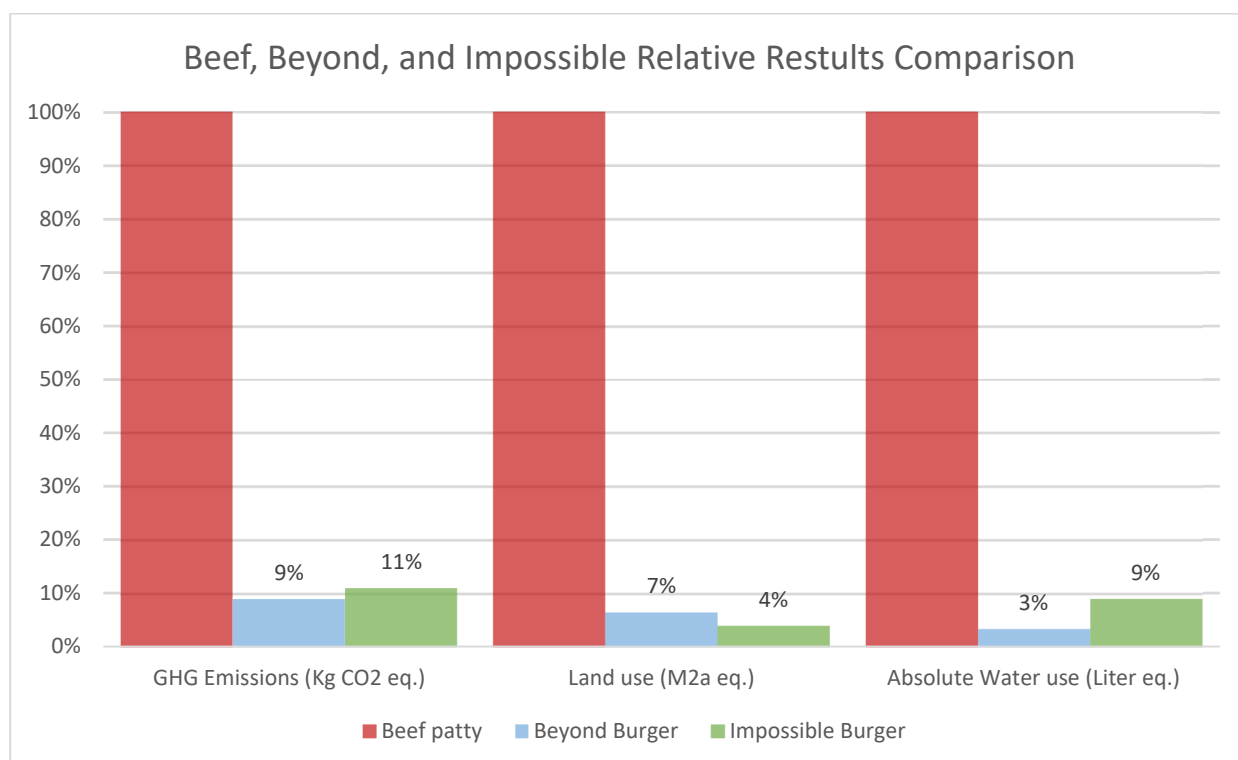


Figure S4. Beef, Beyond, and Impossible burger life cycle impact assessment relative results comparison, with results normalized to beef burger impacts for each indicator. Beef impacts as reported in [4]. Impacts of Beyond as reported in [5]. Impacts of Impossible as reported in [6].

Plant-based burgers compared:



Figure S5. Packaged Impossible Foods beef patties.



Figure S6. Packaged Beyond Meat patties available at retail locations.

References

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3. Meier, T.; Christen, O. Environmental impacts of dietary recommendations and dietary styles: Germany as an example. *Environ Sci Technol* **2013**, *47*, 877–888, doi:10.1021/es302152v.
4. Thoma, G.; Putman, B.; Matlock, M.; Popp, J.; English, L. *Sustainability Assessment of U.S. Beef Production Systems*; University of Arkansas Resiliency Center: 2017.
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