IMPACT: EUTROPHICATION (LCA)

Reference 23

Clark, M; Tilman, D 2017 Comparative analysis of environmental impacts of agricultural production systems, agricultural input efficiency, and food choice
ENVIRONMENTAL RESEARCH LETTERS, 12(6), 64016. 10.1088/1748-9326/aa6cd5

Background and objective

Understanding how alternative agricultural production systems, agricultural input efficiency, and food choice drive environmental degradation is necessary for reducing agriculture's environmental impacts. The analyses and results presented here expand on current knowledge of how food production system, agricultural input efficiency, and food choice affect agriculture's environmental impacts.

Search strategy and selection criteria

The authors searched Web of Knowledge, PubMed, AGRICOLA, and Google Scholar for food LCAs published before July 2015. The authors excluded several publications because a lack of defined system boundaries made direct comparisons with other LCAs impossible. In addition, some LCAs conducted by for-profit companies were excluded because of potential biases.

Data and analysis

The authors first calculated the ratio of impacts of different production systems by food item within each publication, and then calculated the response ratio by taking the natural log of the ratio of impacts (Hedges et al 1999). The authors tested for significant differences between alternative production systems using t-tests on the response ratio.

Number of papers	Population	Intervention	Comparator	Outcome	Quality score
164	Beef cattle	grass-fed	grain-fed	Metric: Eutrophication potential; Effect size: Logarithm of ratio of the considered metrics in the intervention to the considered metrics in the control	56.25

Results

- Grass-fed and grainfed beef had similar impacts per unit food (p > .05)
- NULL
- NULL
- NULL
- NULL

Factors influencing effect sizes

- No factors influencing effect sizes to report

Conclusion

Grass-fed and grainfed beef had similar impacts per unit food.