

Emission Factor Set Selection: Food Purchases

Evaluative Framework & Research Findings

[R&DE Stanford Dining](#) and Stanford's [Scope 3 Emissions Program](#) collaborated to develop a **carbon accounting methodology for food purchases** that will help plan, measure, and execute emissions reduction measures.

What is an emissions factor? Why does it matter? In carbon footprinting, emissions factors represent the quantity of emissions associated with specific activities such as food production. These emissions factor sets may be sourced from academic studies, NGOs, or public sector entities with varying underlying data sources, boundaries, and calculation methods. Emissions factors for one activity –such as kg CO₂e/kg beef purchased – can vary greatly, influencing the estimated magnitude of climate impact to be mitigated. To set mitigation targets and accurately measure progress, a precise and consistent footprint methodology must be used year-to-year, highlighting the importance of a carefully chosen methodology at the outset. Due to the long-term nature of emissions reduction initiatives and the need for accountability, this step is critical in ensuring real impact.

The exercise that R&DE Stanford Dining and Stanford's Scope 3 Emissions Program performed together to select the default emission factor set for food purchases is outlined below, ensuring that selection was based on a systematic approach, mindful of Stanford's priorities and reflective of feasible reduction opportunities. The process for selecting a default emissions factor set to calculate emissions from food purchases included:

- Establishing collective **priorities and concerns** related to the impacts of using different emissions factor sets, resulting in a jointly developed **decision-making framework**
- Creation of a **rubric** featuring **decision criteria** and **relative weights** to outline priorities and reflect relative importance
- Identification of all relevant emissions factor sets
- Evaluation of each emissions factor set according to the decision-making framework

The decision-making framework and corresponding rubric have the following benefits:

- **Consistency:** Systematic evaluation ensures comprehensive and equal judgment
- **Transferability:** Can be used by other institutions and/or in other contexts
- **Customization:** Evaluation can be tailored to the priorities and constraints of each institution
- **Transparency:** Research and evaluation is comprehensively documented
- **Actionability:** Encourages approaches that are practical and mindful of reduction opportunities

The table on the next page shows the evaluation rubric and scoring of four candidate emissions factor sets, resulting in total scores shown in the last row. **Based on its alignment with Stanford's selected criteria, Stanford selected the meta-analysis emission factor set from Poore et al. 2018.**

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Table: R&DE Stanford Dining Emission Factor Evaluation Rubric & Scores for Candidate Emission Factor sets

Evaluation Framework				Scores			
#	Description	Detail	Weight (%)	Heller (2014)	Heller (2018)	Poore 2018 (meta)	Poore 2018 (full)
1	Peer alignment	Prevalence of EF set use among other institutions	12.5	8.3	8.3	8.3	8.3
2	Age of data	How old is the underlying data?	6.25	4.2	4.2	4.2	4.2
3	Compatible with Stanford data	Do food categories match inventory planning system?	12.5	4.2	12.5	8.3	12.5
4	Synergies with diet quality	Options help identify healthy substitutes with fewer emissions	12.5	4.2	8.3	8.3	8.3
5	Credibility, rigor, and quality of assumptions	How many studies are included in the dataset? Which statistical formulas are used to arrive at emission factors?	25	16.7	16.7	25.0	16.7
6	Actionability and practicality	Food EFs precise enough to differentiate products for purchasing strategy	25	8.3	25.0	25.0	25.0
7	Suitable for long-term use	Applicability of methodology in future years, difficulty to update	6.25	4.2	4.2	6.3	2.1
Total Score (100 points possible)				50.0	79.2	85.4	77.1

This rubric is intended to streamline the emissions factor selection process for other institutions, facilitating a transparent, rigorous, and objective approach towards a collaborative decision among all stakeholders on which emissions factor set to use.