

SUSTAINED ● ●

Sustained scoring methodology

June 2022

Introduction

The purpose of Sustained scoring is to provide easy-to-interpret eco-labelling for food products to help consumers make purchasing and consumption decisions with the environmental impact as an input into that process.

Scoring for consumers (Sustained Choice)

Data and mappings

Initially, we focused our efforts on scoring food products that are available in UK supermarkets. Our dataset consisted of:

- A large collection of products sold in UK supermarkets
- List of ingredients for each product
- Percentage of each ingredient in a product (where known)

In addition, we used two LCA databases complemented by Icia_2_0_2 methods pack:

- Agribalyse_v301_27052021
- Ecoinvent_371_cutoff_lci_20210104

We mapped each food ingredient to an industrial process in one of these two databases and calculated its environmental impacts across the 16 categories defined by PEF methodology. We used OpenLCA software to calculate the impacts. As we didn't know the specifics of ingredient sourcing, production processes, transportation etc., we mapped each ingredient to the most generic process available in the LCA databases - usually 'at supermarket' (e.g. Red kidney bean, dried, processed in FR | Ambient (average) | LDPE | at supermarket). Impacts have been calculated per 1kg of each ingredient.

Each mapping has the following properties:

1. Name of ingredient
2. Name of industrial process
3. Datasource (name and version of the database used to calculate the impact)
4. PEF impacts (in physical units)
5. PEF impacts (in weighted person/year)

The 16 impact categories defined by PEF are as follows:

1. Climate Change
2. Water Use
3. Resource use, minerals & metals
4. Resource use, fossils
5. Land Use
6. Ozone Depletion
7. Human Toxicity, Cancer
8. Human Toxicity, non-cancer
9. Ionising radiation, human health
10. Photochemical ozone formation, human health
11. Particulate Matter
12. Eutrophication, marine
13. Acidification
14. Eutrophication, terrestrial
15. Eutrophication, freshwater
16. Ecotoxicity, freshwater

Scoring of ingredients

In order to score each ingredient, we have summed up all PEF impacts expressed in weighted person-years (i.e. PEF impacts after normalisation and weighting) and multiplied the result by 100,000 (purely for convenience of dealing with whole numbers rather than decimals). Higher scores correspond to larger environmental impact, so lower scores reflect more eco-friendly ingredients. The following distribution of ingredient scores has been obtained:

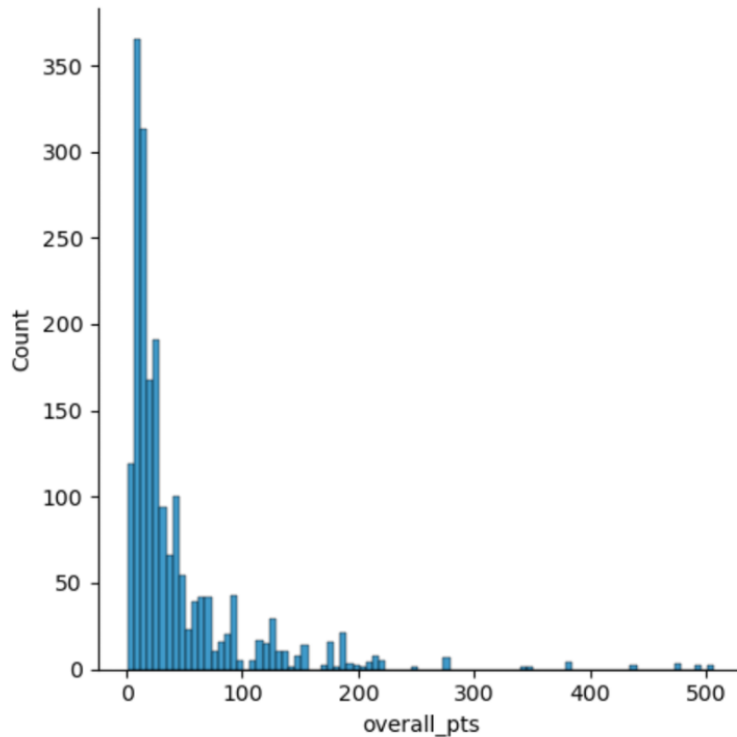


Fig. 1. Distribution of ingredient scores

Scoring of products

In order to score a product, a weighted average of the respective ingredient scores is calculated. Let's suppose that we want to score salmon, broccoli & potato bake with ingredients and scores as shown below.

ingredient	ingredient score	% by weight
potatoes	6.68	42
broccoli	7.98	17
salmon	129.66	25
crème fraîche	33.9	16
Overall:	42.00	100

The overall score of 42 is obtained by weighing the ingredient scores as per the product composition:

$$6.68 \times 0.42 + 7.98 \times 0.17 + 129.66 \times 0.25 + 33.9 \times 0.16 = 42$$

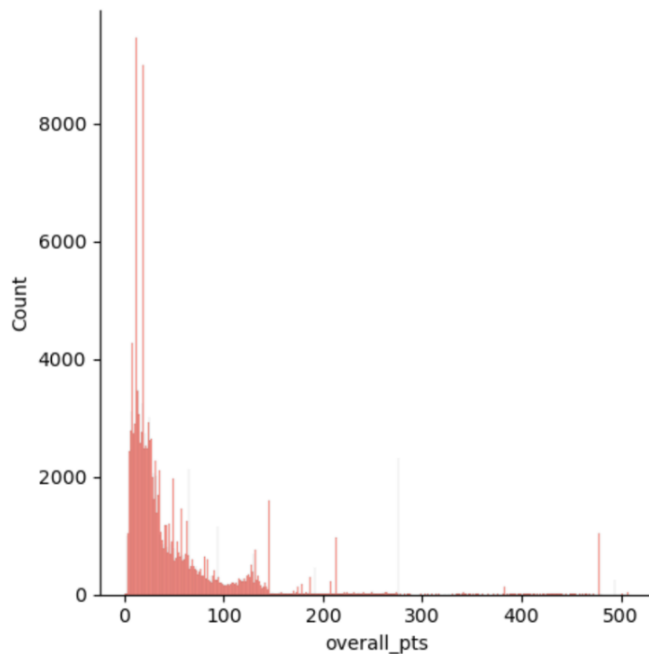


Fig. 2. Distribution of product scores

The distribution of product scores is based on nearly 200,000 products in our database, of which we have rated ~80%. The distribution follows a similar pattern to the one of ingredient scores, but with more pronounced peaks (which likely reflects many different brands of the same product - e.g. all brands of baked beans would be mapped to the same LCA process and thus all baked beans products would have the same score).

From score to grade

The next step in the scoring process is the translation of numeric scores to letter-based ratings from A to G (with A being the best, and G - the worst). We set the thresholds in such a way that a roughly equal number of products in our database falls into each letter bucket. The goal was to avoid a very skewed distribution where the majority of products would fall within the same letter-grade bucket. Instead, we wanted to provide more grade differentiation to enable a better consumer experience.

Data availability penalty

The final step in the scoring process is the application of data availability penalty. In many cases the product composition is not fully disclosed: while the ingredients are listed, their percentages may be stated only partially or not at all. In such cases we predicted missing percentages using a machine learning model. If we had to predict over 40% of a given product composition, we applied a penalty and downgraded the final product rating by one letter grade.

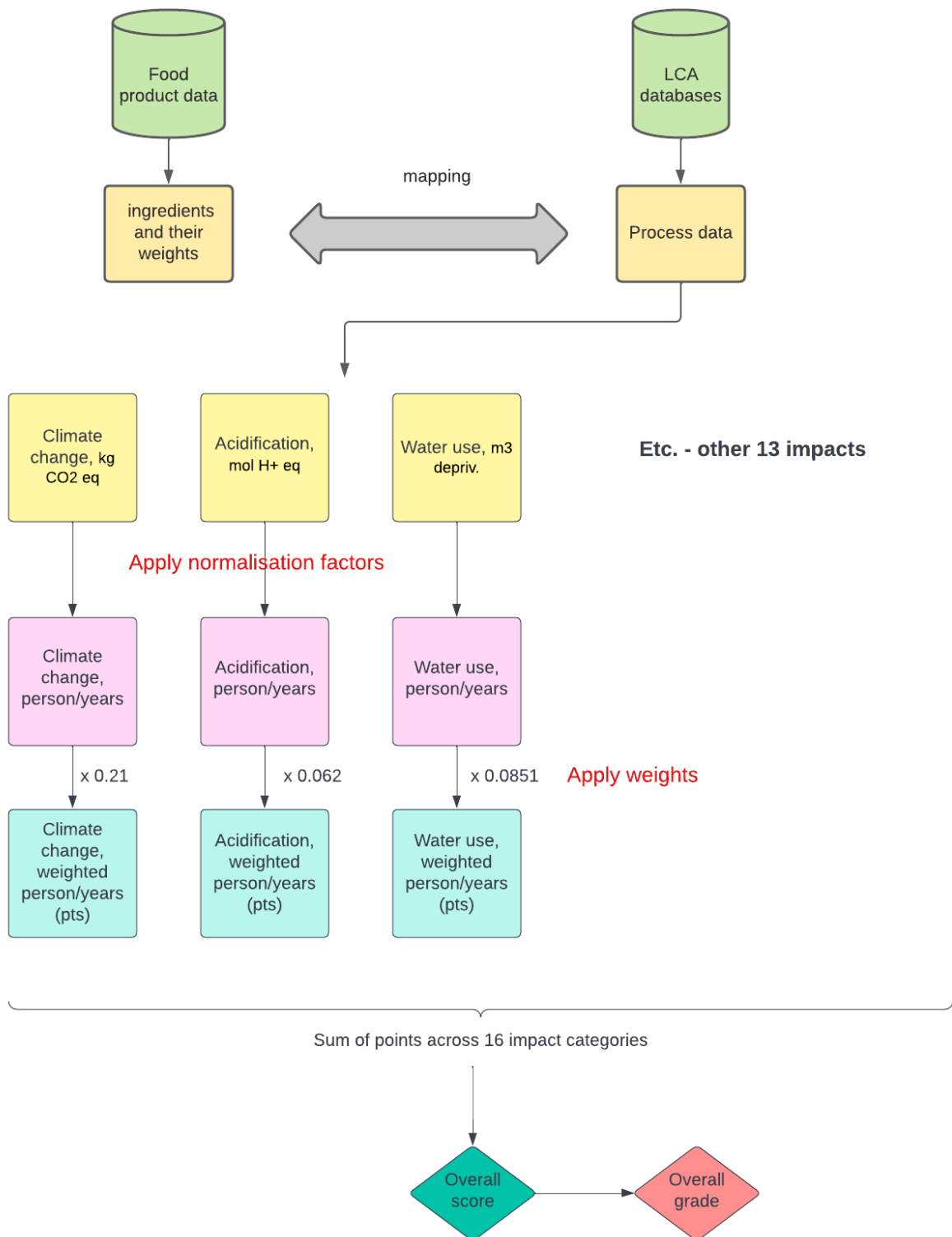


Fig. 3. Summary of Sustained scoring

Limitations

There are many things that we are looking to improve in our approach going forward. Here are the most prominent limitations:

- We currently rely on Agribalyse and Ecoinvent as our main LCA databases. They cover only specific regions, and we'll be adding more regionalisation options in the future.
- The thresholds for assigning grades have been set using a specific dataset and are sensitive to the assortment of products currently sold in UK supermarkets.
- All scores (and grades by extension) are based on 1 kg of product. While this approach provides standardisation and comparability, it doesn't take into account natural differences in consumption. For example, consuming 200g of beef is much easier than consuming 200g of coffee, and while both of these products have very high impacts and some of the worst scores, they do not reflect their typical consumption. We are considering some ways to address this issue.