An investigation into the environmental impact of plant-based milk alternatives compared with dairy milk in the UK

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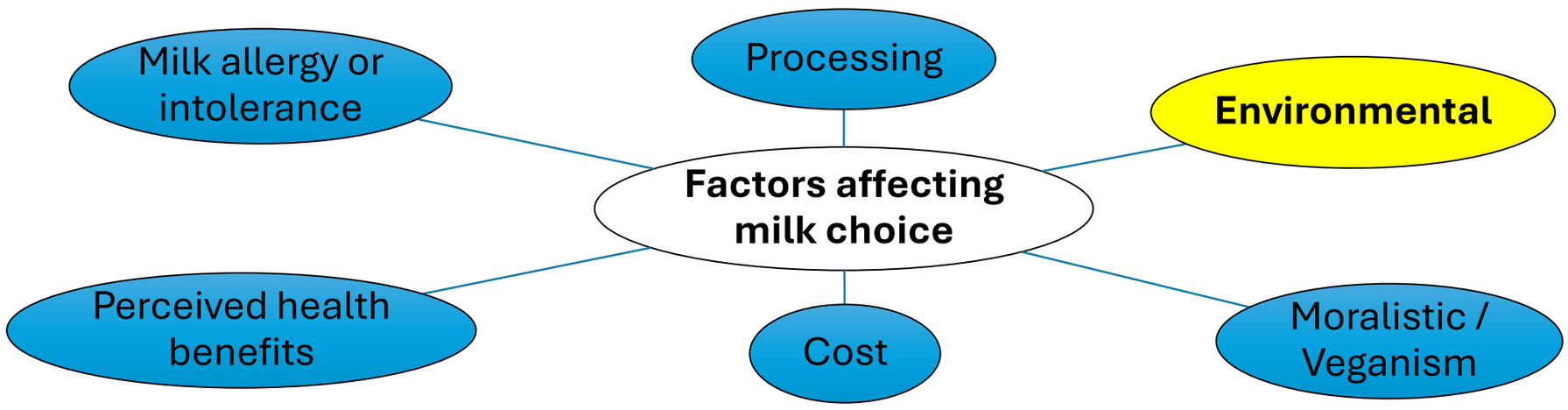

Aim: To investigate the environmental impact of plant-based milk alternatives (PBMA) compared with dairy milk in the UK.

Method

All milks from the top 10 UK supermarkets were surveyed and classified as **dairy** or **PBMA** and by **sub-type (almond, oat, soya, cows etc).**

Environmental impact data for 57,000 food products[1] was mapped to all milks collected. A median **'Total Environmental Impact Score'** (ranging from 0-100; no impact to highest impact) was calculated for PBMA, dairy milk and milk sub types and compared using statistical tests. Median **greenhouse gas emissions** ($KgCo_2e$), **scarcity weighted water use** (L), **land use** (m^2), **aquatic eutrophication potential** (gPO_4eq), **acidification** (PH), and **water use** (L) were calculated for PBMA, dairy milk and milk sub types.

Results

190 products were collected (123 dairy, 67 PBMA)

Dairy milk had a higher total environmental score, land use, greenhouse gas emissions, eutrophication, water scarcity, water use and acidification than PBMA.

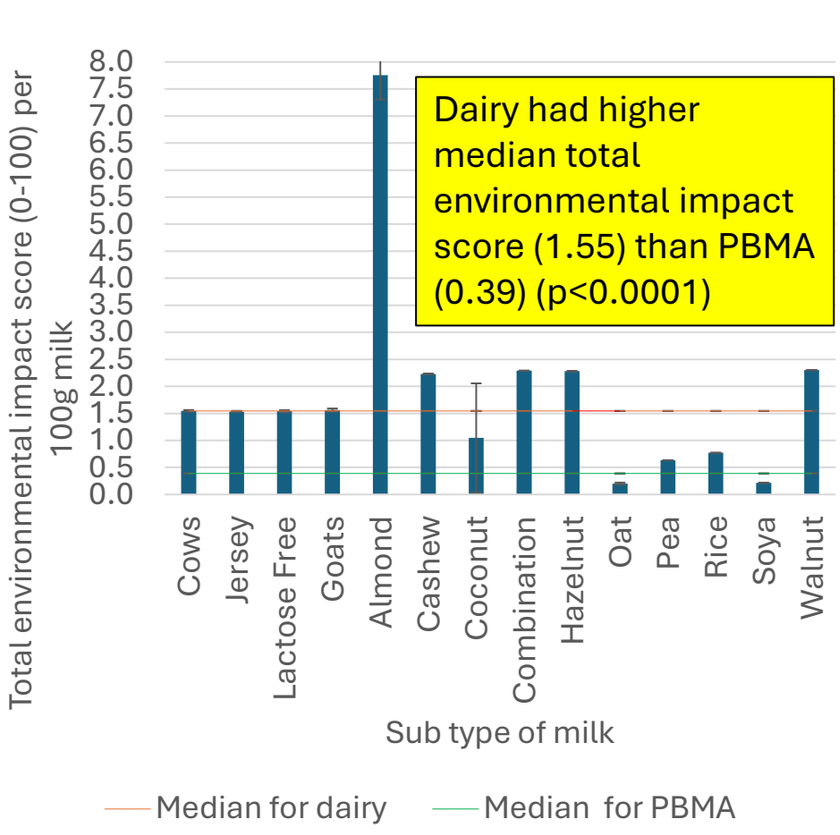

Figure 1: median total environmental impact score' (0-100) per 100g milk.

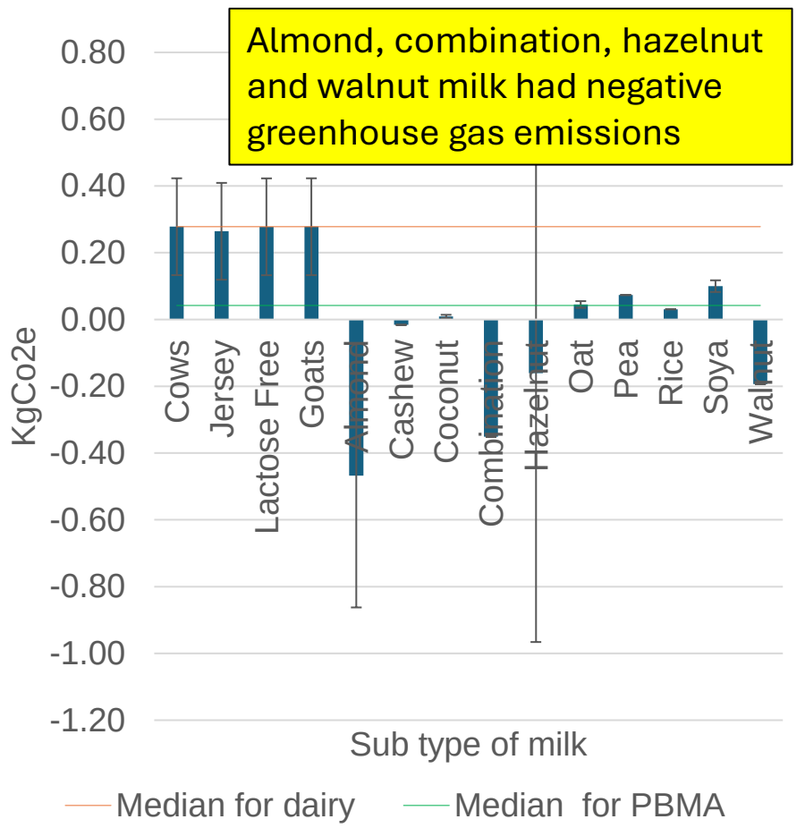

Figure 2: median greenhouse gas emissions (KgCo2e) per 100g milk.

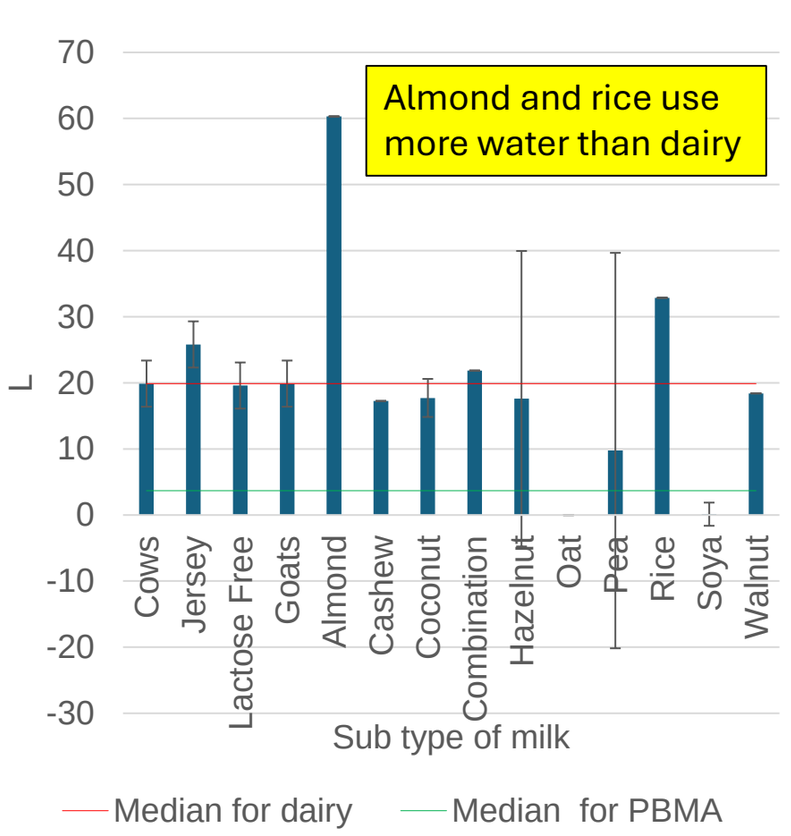

Figure 3: median water use (L) per 100g milk.

Error bars denote a semi-interquartile range. The red line shows the 50th percentile impact (median) for dairy milk and the green line shows the 50th percentile impact (median) for PBMA.

Discussion

- Dairy milk had a higher environmental impact than PBMA however there are exceptions.
- **Note:** the differences in impact are negligible when compared with e.g., 'beef' (score of 32).
- Dietitians need to be prepared for discussions on environmental impact of foods with evidence-based information.
- Data comes from secondary and multiple sources and does not cover all impacts associated with agriculture.

1. Clark M, Springmann M, Rayner M, Scarborough P, Hill J, Tilman D, et al. Estimating the environmental impacts of 57,000 food products. 2022; Available from: https://doi.org/10.1073/pnas.2120584119