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Application of Global Warming Potential Star (GWP*) values to the AUSNUT 2011–13 food composition database: creation of the GWP*-AUSNUT 2011–13 database

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The food supply is known to have a substantial impact on greenhouse gas emissions. The Global Warming Potential Star (GWP*) refers to the amount of carbon dioxide equivalents produced by food items, and can be used to quantify the impact of the food supply on the environment. GWP* values are available for $n = 232$ Australian food products⁽¹⁾. In order to estimate the climate footprint of diets in Australia, GWP* values must be applied to all foods in AUSNUT 2011–13, the most current Australian food composition database. The aim of this study was to systematically apply GWP* values to foods in AUSNUT 2011–13, to facilitate calculation of the climate footprint of Australian dietary data. To create the *GWP*-AUSNUT 2011–13 database*, all $n = 5740$ food and beverage items in AUSNUT 2011–13 were reviewed, and GWP* values were applied via a systematic approach. Initially, GWP* values were matched to AUSNUT 2011–13 foods based on conceptual similarities, where an appropriate GWP* item existed (e.g., *Beef, mince, < 5% fat, raw* was matched to the GWP* item 'Beef meat', with a GWP* value of 16.68 CO₂e/kg). For AUSNUT 2011–13 foods where there was not an appropriate GWP* item, for example composite foods with multiple ingredients, the AUSNUT 2011–13 Recipe File was used to determine constituent ingredients and match these to GWP* items (e.g., *Beef, mince, < 5% fat, baked, roasted, fried or stir-fried, grilled or BBQ'd, canola oil* was matched to the GWP* items 'Beef meat' and 'Canola oil' based on the ingredient proportions in the AUSNUT 2011–13 Recipe File). Where an AUSNUT 2011–13 recipe did not exist, these were determined based on ingredient descriptions in the AUSNUT 2011–13 database, or based on ingredient proportions from a sample of food labels (e.g., *Peanut butter, smooth & crunchy, added sugar & salt*). In the case of single ingredient foods without an appropriate GWP* item match, an average of GWP* values for similar foods (using the AUSNUT 2011–13 food classification categories) was calculated (for example as there was no GWP* item for *Mulberry, raw*, an average of all GWP* items aligning with foods in the AUSNUT 2011–13 minor food group 'berry fruit' was calculated). The systematic process of applying GWP* values to AUSNUT 2011–13 foods was conducted by two researchers independently, with any disagreements resolved via consensus and discussion with the research team. Through application of GWP* values to the AUSNUT 2011–13 food composition database via a systematic process, the *GWP*-AUSNUT 2011–13 database* was created. This database will allow for the estimation of the climate impact from dietary data collected in Australia, both retrospectively and in future studies, to identify the climate footprint of different dietary patterns or to provide insight into dietary changes required to decrease greenhouse gas emissions.

References

1. Ridoutt B, Baird D, Hendrie GA (2021) *Nutrients* **13**, 1122.