

QUANTIFICATION OF HUMAN DIETARY ENVIRONMENTAL IMPACT:

A comparison between Western, Mediterranean, vegetarian and vegan diets.

Eloi Esparraguera Espuña

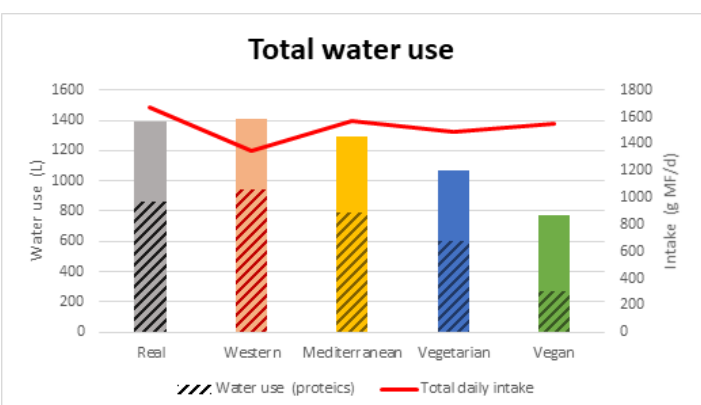
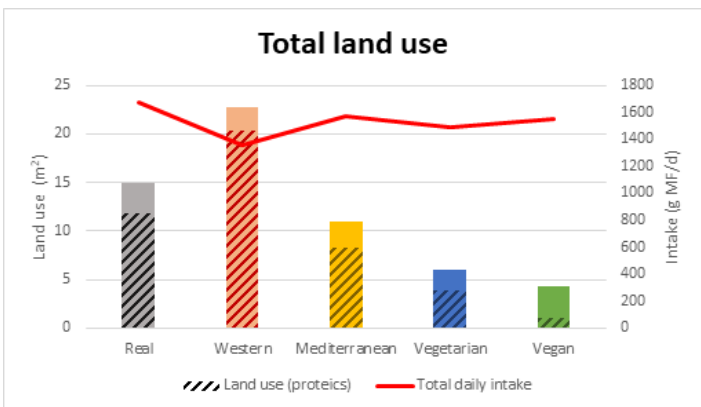
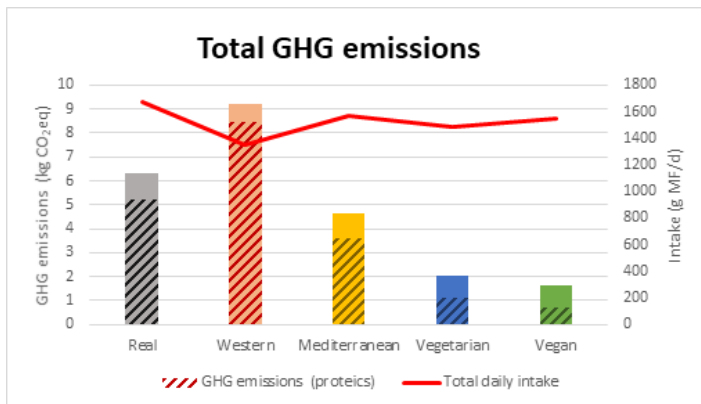
OBJECTIVE

The objective of the present study is to quantify and compare the environmental impact of 4 different theoretical diets, formulated to be nutritionally balanced, and adjusted to a same daily energy intake. These diets mainly differ in their protein sources, ranging from highly animal-based (Western diet) to fully plant-based (vegan diet), with moderated (Mediterranean diet) or low animal-based (vegetarian diet) in between. Simultaneously, the impact of these theoretical diets is compared to a "real diet" based on the Catalan 2019 food consumption statistics.

The study assesses the environmental impact from 3 angles: greenhouse gas emissions (GHG), land use and water use.

RESULTS

Figures below show total environmental impact of each diet:

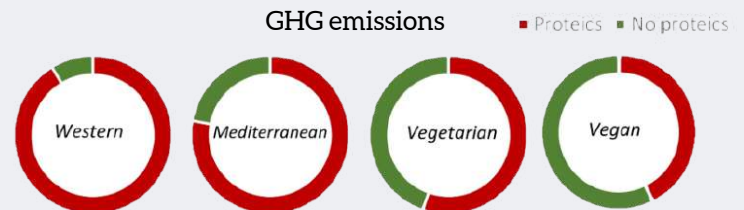


Main findings

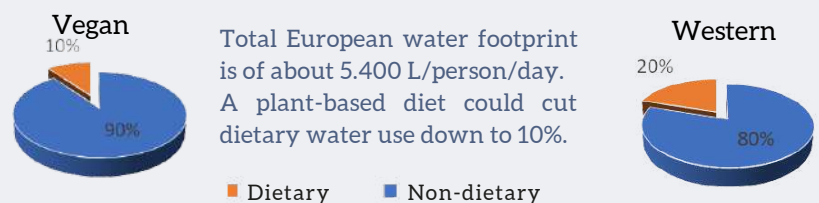
- Formulated *veggie* diets emit, on average, one-fifth of the GHG emitted by the Western diet. In turn, the Mediterranean diet emits half the emissions of the Western diet, but more than twice as much as the vegetarian and vegan diet.
- The Western diet requires twice the surface area of the Mediterranean diet to provide the same level of energy. At the same time, *veggie* diets need half the ground to provide the same amount of calories as the Mediterranean diet.
- The Mediterranean diet requires 8% less water than the western diet, but 17% and 40% more than the vegetarian and vegan diets, respectively.



As shown in graphics below, the more animal products a diet contains, the more emissions of its total impact are due to protein-rich foods.



Due to lack of arable land, none of the theoretical diets could feed Catalonia relying only on Catalan products. On the Spanish context, only the vegetarian and vegan diet could fully feed the entire population using national products alone.



CONCLUSIONS

- On the total count of a dietary environmental impact, it is more determinant the type of ingredients rather than the intake volume.
- Environmental impact differences between diets are mainly due to the kind of protein sources they rely on.
- There's a strong correlation between the amount of animal products in a diet and its environmental impact.