

Impact of current diet, national dietary guidelines and alternative diets on greenhouse gas emissions in Argentina

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Introduction

Food production is a major driver of greenhouse gas (GHG) emissions, water and land use, and biodiversity loss, being animal source foods in particular the major contributors to these environmental changes.¹

There is an urgent need to curb the degradation of natural resources and to limit global warming to less than 2°C, while providing a nutritious diet to a growing and changing world population.

In combination with technical advances in agriculture,² dietary change are suggested to be necessary to reduce the environmental impact of the food system.^{3,4}

FAO projections indicate an increase in animal source foods in the next decades, particularly in developing countries; hence an increase in GHG emissions in the food sector is also expected.

At present, Argentina closely rivals Uruguay for the most beef consumption per capita, and the daily amounts ingested far exceed the recommendations for cancer prevention.

The main goal of this study is to investigate the composition and GHG emissions of the current diet in Argentina and compare it with the dietary guidelines provided by the national public health institutions and other three dietary scenarios, each of which maintain the nutritional recommendations but reduce or exclude animal source foods. Indicators for nutrient efficiencies were also developed.

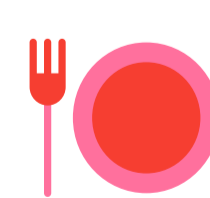
Material and methods



The composition of the current diet was analysed using The Food Consumption Atlas (TFCA) developed by the National Institute of Agricultural Research (INTA). This data base includes the analysis of the consumption of more than 300 types of foods and drinks.



The food composition database from the United States Department of Agriculture (USDA) was used to assess energy, protein, carbohydrate and fat content in foods and drinks.



Five scenarios have been studied: 1) current diet based on TFCA; 2) diet recommended on the National Dietary Guidelines (Ministry of Health); 3) diet with no-ruminant meats; 4) lacto-ovo vegetarian; 5) vegan diet. All diets studied in this work were standardized to 2000 kcal/person/day.



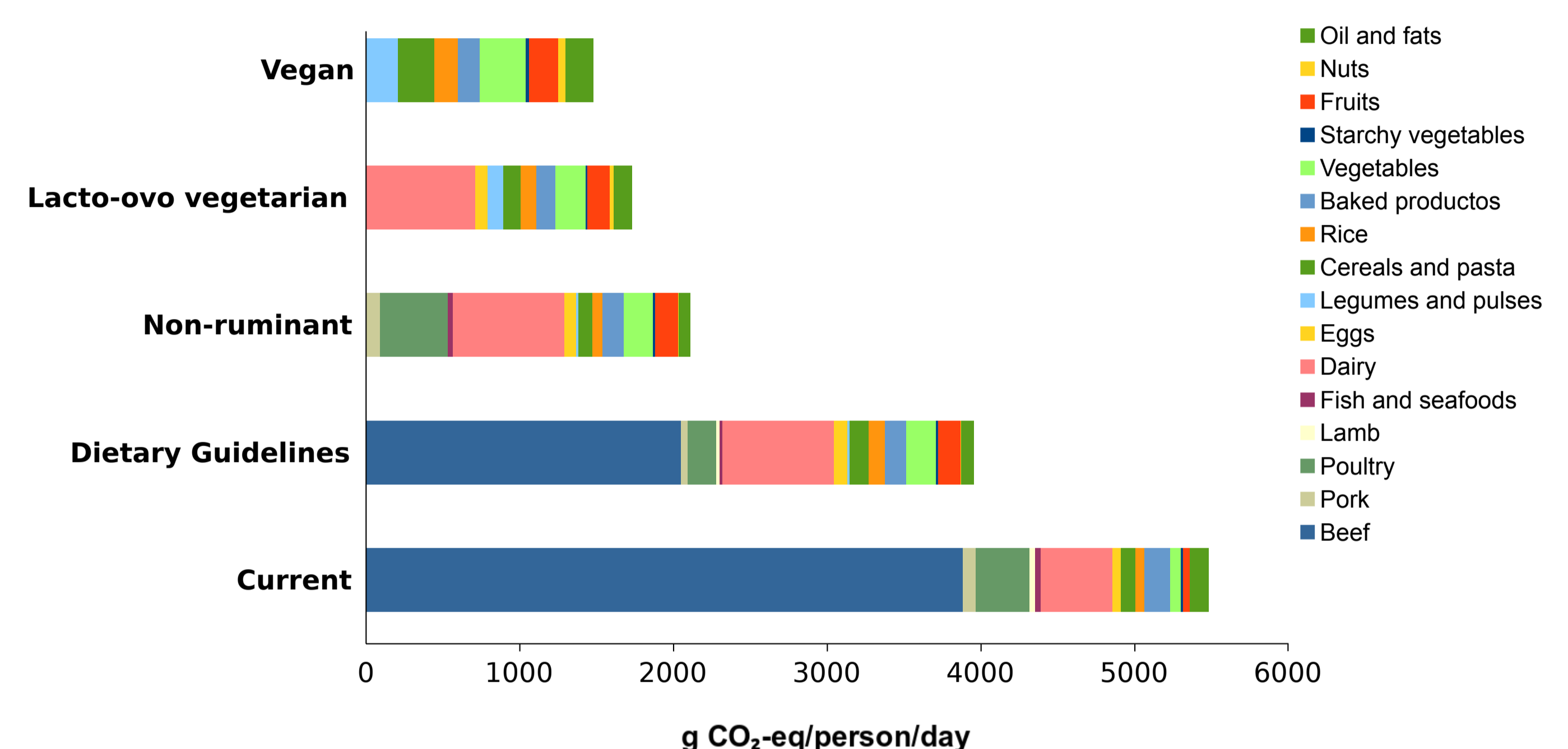
GHG emissions of food were obtained from sources that have reviewed data from several studies worldwide.^{5,6}

References:

- (1) Nijdam *et al.* (2012). *Food Policy* **37**, 760-770; (2) Wollenberg *et al.* (2016). *Glob Chang Biol* **22**, 3859-3864; (3) Springman *et al.* (2016). *PNAS* **113**, 4146-4151; (4) Hedenus *et al.* (2014). *Clim Chang* **124**, 79-91; (5) Clune *et al.* (2017). *J Clean Prod* **140**, 766-783; (6) Tilman & Clark (2014). *Nature* **515**, 518-522.

RESULTS

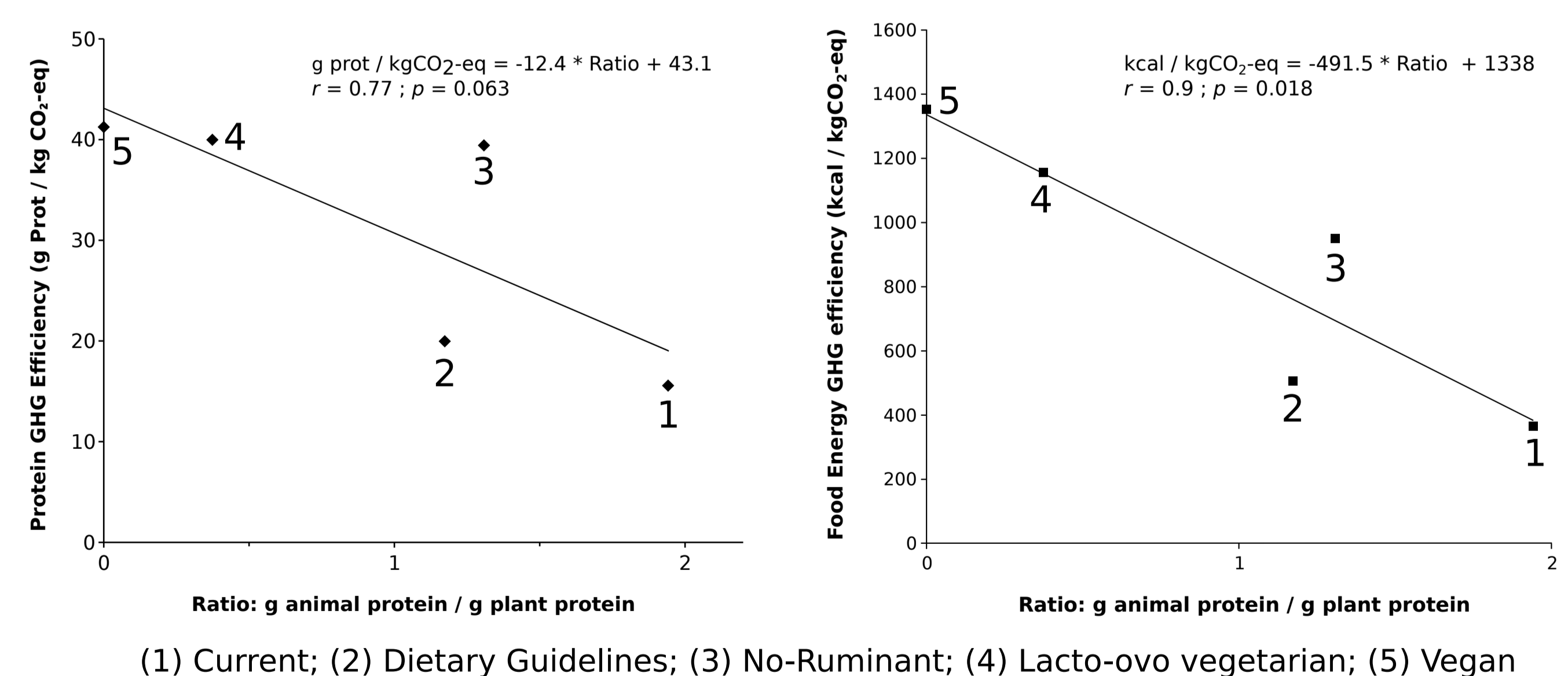
1 Diets studied and GHG emissions



Greenhouse gas emissions (GHG) of the current Argentinian diet found very high, with beef production contributing the largest share of emissions (71%).

2 Nutrient/GHG efficiency

The nutrient/GHG efficiencies improve as the diet reduces animal products and meats from ruminants.



CONCLUSIONS

The results of this study indicate that a set of dietary changes would significantly contribute to lower GHG emissions, and decrease beef consumption would be the action with the higher impact. Argentina's national dietary guidelines should include the environmental impacts of food consumption in order to enhance awareness of consumers as well as in professionals.