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Nutritional quality and greenhouse gas emissions of vegetarian and non-vegetarian school meals: a case study in France (Dijon)

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Background/Objectives: Since 2018 in France, national regulation imposes that school canteens serve a weekly vegetarian meal. However, a lunch without meat is often perceived as inadequate to cover the nutritional needs of children⁽¹⁾. The present study aims to assess the nutritional quality and greenhouse gas emissions (GHGE) of vegetarian and non-vegetarian school meals served in Dijon, France.

Methods: The 249 menus served in 2019 were provided by Dijon catering department. Each meal component (starter, protein dish, side dish, dairy product, dessert) was paired with a food item from Ciquial 2020 and Agribalyse 3.0 databases to retrieve nutritional content and GHGE data, respectively. The portion size of each meal component was the standard portion size recommended by the relevant authority (GEMRCN). Meals were classified into vegetarian meals (n = 66) when all components were meat- and fish-free, or non-vegetarian meals (n = 181). The nutritional adequacy of meals was estimated by the Mean Adequacy Ratio (MAR) as the mean percentage of daily recommended intakes for 23 essential nutrients and by the MAR/2000 kcal considering lunch as the only source of energy for a daily intake of 2000 kcal.

Results: On average, a menu provided 659 kcal (SD 34) and emitted 1.8 kgCO₂eq (SD 1). The MAR was 48.5% (SD 6) and the MAR/2000 kcal was 85.2% (SD 4.6). The energy contents of vegetarian menus (658 kcal SD 119) and nonvegetarian menus (660 kcal SD 127) were similar (T-test: p = 0.95). GHGE of vegetarian menus were 0.9 kgCO₂eq (SD 0.3) and 2.1 kgCO₂eq (SD 1) for non-vegetarian menus (p < 0.001). The MAR was 48.4% (SD 5.5) for vegetarian menus and 50.6% (SD 6.2) for non-vegetarian menus (p = 0.01). The MAR/2000 kcal of vegetarian menus (87.8% SD 56) and non-vegetarian menus (88.9% SD 4.4) were similar (p = 0.17). A vegetarian meal covered 97.8% (SD 25.3) of daily proteins recommended intake, and a non-vegetarian meal 128.7% (SD 29.3) (p < 0.001). For all meal, vitamins C and D, calcium and ALA contents were below the recommended intakes with regard to energy provided. In vegetarian meals, potassium, zinc and DHA contents were below the recommended intakes.

Discussion / Conclusion: This analysis of actual school meals shows that vegetarian and non-vegetarian meals had a good nutritional quality. Further nutritional evaluation would imply evaluating saturated fatty acids, salt and added sugar contents. Since GHGE were twice as less for vegetarian menus, increasing their frequency would reduce GHGE of meals while maintaining a good nutritional quality. The impacts of vegetarian meals on cost, pleasure from eating, food waste and school canteen attendance remain to be investigated⁽²⁾.

References

1. CGAAER (2021) Evaluation of the weekly vegetarian menu experimentation in school canteens.
2. FAO (2019) Sustainable healthy diets Guiding principles.

Disclosure of Interest

None Declared