

## Abstract

# The Environmental Impacts of Omnivorous, Vegetarian, and Vegan Children and Adolescents in Germany: Results of the VeChi Diet and VeChi Youth Studies <sup>†</sup>

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<sup>†</sup> Presented at the 14th European Nutrition Conference FENS 2023, Belgrade, Serbia, 14–17 November 2023.

**Abstract:** Background and objectives: There is a lack of data on the environmental impact of children's and adolescents' food consumption as most studies only consider adult dietary intake and, in addition, use hypothetical diets or focus on specific food products. Hence, our aim was to assess two indicators of environmental impact of the total diet among omnivorous (OM), vegetarian (VG), and vegan (VN) children and adolescents from Germany. Methods: Greenhouse gas emissions (GHGE) and land use (LU) were calculated using 3-day weighed dietary records from 820 participants (1–18 years old) of the cross-sectional VeChi Diet Study ( $n = 430$ , 1–3 years of age, conducted 2016–2018), the VeChi Youth Study ( $n = 390$ , 6–18 years, 2017–2019), and the life cycle-analyses food-item (SHARP-Indicators) database. Group differences of indicators were analysed using analysis of covariance. Results: On average, food consumption of OM, VG, and VN diets caused GHGE of 2.6, 1.6, and 1.0 kg CO<sub>2</sub>eq/kg food and LU of 3.1, 2.0, and 1.6 m<sup>2</sup>·year/kg food, respectively. The median total daily GHGE and LU amounts differed significantly between diet groups ( $p < 0.001$ ). Standardisation to energy intake per 1000 kcal (GHGE: (OM) 2.2, (VG) 1.3, (VN) 0.9 kg CO<sub>2</sub>eq/1000 kcal; LU: (OM) 2.5, (VG) 1.6, (VN) 1.3 m<sup>2</sup>·year/1000 kcal) confirmed these results. Discussion and conclusions: To the best of our knowledge, this is the first evaluation to show that even in children and adolescents, the GHGE and LU caused by an OM diet is considerably higher than the GHGE and LU on a VG or VN diet. In this way, plant-based diets performed better in terms of environmental sustainability.

**Keywords:** environmental impacts; greenhouse gas emissions; land use; sustainability; child nutrition; vegan diet; vegetarian diet



**Citation:** Kuhl, L.; Keller, V.; Weder, S.; Alexy, U.; Fischer, M.; Keller, M.; Michalsen, A.; Längler, A.; Sputtek, A.; Gwozdz, W. The Environmental Impacts of Omnivorous, Vegetarian, and Vegan Children and Adolescents in Germany: Results of the VeChi Diet and VeChi Youth Studies. *Proceedings* **2023**, *91*, 430. <https://doi.org/10.3390/proceedings2023091430>

Academic Editors: Sladjana Sobajic and Philip Calder

Published: 15 May 2024



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**Author Contributions:** U.A., M.K. and S.W. designed the VeChi Diet and VeChi Youth study; U.A. and M.K. supervised the study; M.F., S.W., A.M. and A.L. were involved in the implementation and data collection; L.K. analysed the data and drafted the manuscript under the supervision of W.G. and S.W.; A.S. supervised the laboratory analysis; V.K. presented the manuscript at the 14th European Nutrition Conference FENS 2023, Belgrade, Serbia, 14–17 November 2023. All authors have read and agreed to the published version of the manuscript.

**Funding:** The VeChi Diet study was partially funded by the Erna Graff Foundation for Animal Protection; the VeChi Youth Study was commissioned to the 14th DGE Nutrition Report 2020 published

by the German Nutrition Society (DGE) and financially supported by the Federal Ministry of Food and Agriculture (BMEL), Germany.

**Institutional Review Board Statement:** The studies were conducted in accordance with the Declaration of Helsinki, and approved by the Ethics Committee of the University of Witten/Herdecke (VeChi Youth Study, 139/2017, 21 September 2017) and by the Ethics Committee of the University of Bonn (VeChi Diet Study, 046/17, 2 March 2017).

**Informed Consent Statement:** Informed consent was obtained from all subjects (or their parents) involved in the studies.

**Data Availability Statement:** The data described in the manuscript might be made available on request.

**Conflicts of Interest:** All authors declare no conflicts of interest.

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