

Development of a diet quality score and adherence to the Swiss dietary recommendations for vegans

Project 580

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Background and aims: Veganism is gaining popularity in high-income countries like Switzerland, partly due to its environmental benefits and potential health advantages, including a reduced risk of chronic diseases. However, some studies suggest that vegans may have a higher risk of strokes and fractures, possibly due to deficiencies in certain nutrients like vitamin B12, calcium, and iron. Existing research often overlooks the quality of vegan diets, which can vary widely. For example, some vegans may consume excessive sweets or rely heavily on processed foods. Currently, there is no specific diet quality score tailored for vegans, which makes it challenging to assess their nutritional intake accurately. To address this gap, our study aimed to develop a Vegan Diet Quality Score (DQS-V) based on the Swiss dietary recommendations for vegans which have been released by the Swiss Working Group for Vegetarian Diets (SVDE). We also evaluated how well a sample of vegans adhered to these recommendations. Further, we explored the relationship between the DQS-V and nutrient intake, as well as biomarkers of fruit and vegetable consumption. Additionally, we aimed to identify different dietary patterns among vegans using data-driven methods.

Methods: The study utilized a dataset collected in 2011 from 52 healthy adult subjects aged 18 to 50 who had been following a vegan diet for at least a year. Participants were recruited from Lausanne and Zurich. Data collection involved measurements of body weight, height, urine samples, and venous blood samples for vitamin and mineral analysis. Dietary intake was assessed through a three-day weighed food record, and lifestyle factors were evaluated via questionnaires. The Swiss dietary recommendations for vegans were developed based on expert opinions and national guidelines. Additionally, a diet quality score for vegans (DQS-V) was formulated based on these recommendations, categorized into adequacy and quality, moderation, and overall balance components. Statistical analysis included t-tests, correlation coefficients, and principal component analysis to identify dietary patterns.

Results: The study involved 52 participants, with 61.5% women and 38.5% men, having a median age of 29 years and a median BMI of 21.6 kg/m². They had followed a vegan diet for a median duration of three years. The mean \pm SD DQS-V was 48.9 ± 14.7 , with women scoring slightly higher (23.0 ± 6.6) than men (19.9 ± 4.7 , $p = 0.077$). The median intake of each food group in grams showed that participants generally met recommendations for vegetables, vitamin C-rich vegetables, fruits, starchy foods, fats and oils, and iodized salt. However, they consumed less than half the recommended portions of certain groups such as green leafy vegetables, vitamin C-rich fruits, whole grains, omega-3-rich nuts, fats and oils, and calcium-fortified foods. Correlation analysis indicated that a higher DQS-V correlated positively with

protein ($r = 0.33$, $p < 0.05$), fiber ($r = 0.37$, $p < 0.01$), and various minerals, while inversely correlated with Vitamin B12 ($r = -0.43$, $p < 0.01$). Two dietary patterns emerged: one high in refined grains and sweets and the other in whole grains and nuts, both showing significant associations with DQS-V and certain serum biomarkers.

Conclusion: The study developed and assessed the Diet Quality Score for Vegans (DQS-V) based on Swiss dietary recommendations, offering a comprehensive measure of diet quality for Swiss vegan adults. Results highlighted significant variability in diet quality among vegans, with some individuals failing to meet recommended dietary guidelines. The findings underscore the importance of promoting specific food groups and conducting thorough diet quality assessments in dietary counseling for vegans. Further validation studies utilizing independent dietary assessment methods and biomarkers are necessary before widespread adoption of the DQS-V.