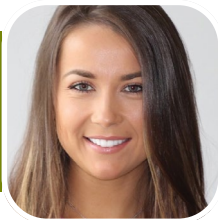




# The impact of a vegetarian diet on oral health



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## Introduction

The vegetarian diet has been associated with several health benefits including:

- Reducing the risk of systemic diseases such as cardiovascular disease (CVD)
- Lowering the risk of certain cancers and diabetes mellitus type II.<sup>1</sup>

However, critics of vegetarianism often highlight the lack of protein and vitamin B12, both of which are considered to be key nutrients.<sup>2</sup> A systematic literature review by Galchenko *et al.*<sup>3</sup> explores the topic of protein deficiency within the vegetarian group and argues that vegans are more at risk, due to insufficient intake of the amino acid methionine. A dental therapist's role includes providing dietary advice to patients which can encompass the subject of nutrients. This advice, if followed,

can help in the reduction of the patient's risk of oral disease.

## Aim

The vegetarian diet and its impact on oral health is a subject with limited published literature. The literature review aim was to investigate the current evidence available to answer the clinical question: 'Do vegetarians have a higher risk of developing oral diseases, compared to non-vegetarians?'

## Methodology

The search was conducted from August 2022 to December 2022, papers were critically appraised, and nine papers are included in the review. The methodology was a systematic search on electronic databases, CINAHL and PubMed. Boolean connectors and truncators

were applied and in addition, inclusion and exclusion criteria were utilised. Randomised controlled trials (RCTs), cross-sectional and clinical studies were all included. The papers were further sub-categorised into studies relating to periodontal conditions, caries, and erosion.

## Results

The evidence relating to periodontal status and the vegetarian diet was found to be much greater than that for the prevalence of caries and erosion. A total of six studies investigated the impact of some form of vegetarian diet and periodontal health, three of which mentioned decayed, missing and filled teeth (DMFT) findings within the paper. Five in total found this diet to have a positive impact on the periodontium. There were limited studies which

focused exclusively on the vegetarian diet, caries, and erosion. From the data gained, more decay and erosion was found among vegetarians. There was only one paper presenting no significant association found between vegetarianism, mixed dietary habits, and caries.

### Discussion

The evidence relating to this subject is limited, particularly for caries and erosion, compared to the effects on periodontal health. The papers associated with periodontal findings and the vegetarian diet were mostly cross-sectional-style studies. Considering the strength of a cross-sectional study, it ranks relatively low on the hierarchy of evidence, however, should not be disregarded. One randomised controlled trial (RCT) paper was found, providing stronger evidence due to a decreased risk of bias.

The findings relating to periodontal health primarily found the vegetarian diet to have a positive effect on the periodontium and reduce the risk of periodontal disease. This was manifested with lower periodontal pocket depth (PPD), bleeding on probing (BOP) and periodontal screening index (PSI). Only one study concluded the vegetarian diet has a negative impact on periodontal parameters.

during this study suggests being more diet related. Staufenbiel *et al.* used DMFT indices in their methodology to confirm their findings of vegetarians to have more erosion.<sup>7</sup> Atarbashi-Moghadam *et al.*<sup>8</sup> suggest a lower pH could be due to a vegetarian diet, especially raw vegans, consuming more fruits and therefore causing an acidic oral environment.

There were recurrent themes running through several of the papers, one of which was the subject of recruitment in India. Higher rates of vegetarianism are found in India, which can leave questioning of the validity associated with the 'mixed diet' group's meat intake. This could be the reason why the results found no significant association between both dietary groups. Overall lifestyle was also associated with the vegetarian diet and could be a possible influential element to oral health. Several subjects declared the reasons for consuming no meat was due to health improvement potential, this health-conscious mindset could be the reason for better oral hygiene habits in this group. A possible confounding variable could be the length of time the vegetarian diet had been followed, potentially having an influence on the manifestation of dental disease.

Staufenbiel *et al.*<sup>7</sup> also reported vegetarians

The topic of this literature review explored knowledge in an emerging area of dentistry and ultimately may improve understanding for healthcare professionals to educate patients of the possible oral risks associated with the vegetarian diet. The need for more research is evident and the outcome of this literature review warrants further exploration.

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*'Evidence suggests the vegetarian diet consists of more anti-inflammatory foods and therefore, may reduce periodontal inflammation.'*

A total of six studies included DMFT indices for analysis of caries, three of which found no difference between vegetarians and non-vegetarians, however, there was a lack of statistical significance. Two found statistically significantly more decayed teeth in vegetarians and one found statistically significant evidence of more filled teeth in raw vegans. Only one study by Kavitha *et al.* focused solely on the prevalence of dental caries.<sup>4</sup> The mixed evidence for caries risk leaves the opportunity for further investigation. However, Staufenbiel *et al.*<sup>5</sup> proposed a reason for more caries found could be due to the vegetarian diet containing more acidic foods. Increased consumption of fruit among vegetarians resulted in statistically significantly higher erosive tooth wear.

Pedrão *et al.* was the only study to analyse erosion, using the BEWE index.<sup>6</sup> As the palatal surface was less affected, the erosive wear found

having better oral hygiene habits; furthermore, the results confirm the importance of regular use of fluoride-containing toothpaste. This proved to have a more effective role in caries prevention than the yearly application of highly concentrated fluoride documented within this investigation.

### Conclusion

The review found the vegetarian diet to have a positive effect on the periodontium. Evidence suggests the vegetarian diet consists of more anti-inflammatory foods and therefore, may reduce periodontal inflammation. Conversely, the consumption of higher antioxidant foods such as fruits poses a higher risk of dental erosion, thus leaving the demineralised tooth more susceptible to caries. Finally, the importance of fluoride toothpaste against the risk of decay was confirmed.