

Literature review of the nutritional adequacy of a typical gluten-free diet

Area of research interest: [Food hypersensitivity](#)

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Project code: T07053

Conducted by: Diet and Health Department, Coeliac UK

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Background

Coeliac disease is a life-long autoimmune disease caused by intolerance to gluten, a protein found predominately in wheat, barley and rye cereals. In those affected by coeliac disease, consumption of gluten causes damage to the gut lining, resulting in a wide range of symptoms such as bloating, diarrhoea and nausea, as well as longer term health consequences if the disease is not managed. Management involves a strict gluten-free diet.

In the UK, people with medically diagnosed coeliac disease may access some of their gluten-free substitute foods on prescription but there are also a growing number of foods available that make “gluten-free” claims. There is no specific evidence base that compares the nutritional composition of gluten free foods to standard products and it is not well understood whether or not the diet of those following a gluten-free diet is nutritionally adequate. We identified a policy need to identify, collate and review the existing scientific evidence on the nutritional adequacy of a typical gluten-free diet, with particular regard to the nutrients iron, calcium, folate, Vitamin D and the B Vitamins. The purpose of the research was to inform our understanding of whether the diet of UK consumers with coeliac disease, who are following a gluten-free diet, is nutritionally adequate. If not, there is a need for specific dietary advice or other strategies to ensure that these consumers can maintain a nutritionally adequate diet whilst avoiding gluten containing cereals.

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Research Approach

The researchers carried out a systematic literature review searching electronic bibliographic databases Medline, Embase, the Cochrane Library and CINAHL, followed by hand searching of reference lists to identify relevant evidence. In addition, the researchers contacted the leading authors plus other key individuals and organisations in order to identify any relevant unpublished data. A list of inclusion and exclusion criteria was agreed and only papers including subjects with medically diagnosed coeliac disease following a gluten-free diet of six months or more were used. Scottish Intercollegiate Guidelines Network (SIGN) assessment checklists, were used to analyse the cohort studies and case control studies. Criteria used to assess the quality of studies differed for each study type. A data extraction tool was developed by the research team specific to the protocol for the systematic review taking into account the inclusion and exclusion criteria.

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Results

Only eleven published studies were identified which met the review criteria, ten case-control studies and one cohort study. Each of the papers was assessed for the risk of bias by using checklists and a grading system as recommended by SIGN. Factors considered included sample size, recruitment of participants, analysis of diet histories, inclusion and exclusion criteria and whether potential confounding factors had been addressed and likely author bias.

All papers were graded as moderate or high risk of bias, suggesting that the data available are not robust enough to draw definitive conclusions. Notwithstanding this, most of the papers concluded that individuals with coeliac disease following a gluten-free diet had the same nutritional intake as the general population. Where the results were found to differ between these groups, any statistical significance was not adequately recorded, meaning no firm conclusions could be made. Unpublished work provided by one leading researcher provided some evidence of statistical significance with regards to energy intake (there was a significant increase in energy intake for female patients on a GF diet compared to the control group). However the data had been split to demonstrate the differences between females and males. No statistical data has been provided regarding the whole population group.

The literature review shows the limited evidence base available on the nutritional adequacy of the gluten-free diet. The methodologies applied in the individual studies included in the review, differed significantly from one study to another, eliminating the possibility of pooling of data and meta-analysis. This makes statistically significant comparisons and conclusions impossible.

The researchers therefore concluded that there is no existing robust evidence to show that individuals with coeliac disease adhering to a gluten-free diet experience any nutritional deficiency. There was also no firm evidence to show that individuals following a gluten-free diet had an inadequate intake of iron, calcium, and B vitamins. However, these conclusions may reflect the small amount of data, rather than a genuine absence of nutritional deficiencies between conventional and gluten-free diets.

Research report

England, Northern Ireland and Wales

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