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Pulse-rich diets are associated with higher micronutrient intake and serum micronutrient status in UK children aged 1–18 years

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Within the UK it is estimated that 3% of the overall population are undernourished, with 27% of households with children under the age of 4 years experiencing food insecurity in January 2023⁽¹⁾. Pulses, defined as dry edible seeds of the legume family, are nutrient-dense and rich in high quality protein, fibre, and micronutrients. Intake of pulses is low in the UK diet, with only 41% of the population consuming an average of 18.5 g per person per day⁽²⁾. Data on pulse consumption in UK children is limited and has been reported to be below dietary recommendations⁽³⁾. The objective of this analysis was to assess the association of pulse-rich diets with nutrient density and circulating micronutrient status in UK children.

Four-day estimated dietary diary data from the National Diet and Nutrition Survey (NDNS) for children aged 1–18 years collected between 2008 to 2019 (Years 1–11) was analysed using linear regression survey command in Stata version 17. Mean dietary intake for macronutrients and micronutrients was weighted to reduce sample bias prior to statistical analysis. Bivariate analysis (covariate: energy) and multivariate analysis (covariates: energy, sex and age) was conducted on outcomes to determine the relationship of pulse intake with nutrient density and circulating micronutrient status in UK children.

Children (n = 7656, 48% boys and 52% girls) consumed on average 11.7 (SD 20.5) g/day pulses with baked beans the main pulse-based food in the average diet. Bivariate analysis revealed children from households with an income under £5000 had a lower intake of pulses compared to children from households that earned between £25,000–29,999/year, (p = 0.049). In multivariate analysis, consumption of one portion (80g/day) of pulses was associated with higher dietary fibre (7.2g), polyunsaturated fats (1.2mg), vitamin E (1.3g), thiamine (0.08mg), niacin (2.4mg), phosphorus (42.4mg), magnesium (39.2mg), folate (32mg), zinc (0.32mg), total iron (1.8mg); and lower dietary saturated fat (2.0g), processed red meat (3.6g), total meat (27.2g), free sugars (12.0g) and haem iron (0.008mg), (all P < 0.005). Consumption of one portion of pulses was associated with lower serum ferritin (7.5mg/L), 25 hydroxy vitamin D (6.5 nmol/L), serum zinc (0.48 mg/L), vitamin B₆ (10.4nmol/L) and higher serum thiamine (0.02 ETKAC), (all P < 0.005).

Although, these data demonstrate that pulse-rich diets were generally associated with favourable nutrient intakes in children, this did not translate into higher circulating markers of micronutrient status, except for serum thiamine. This may reflect other components of the pulse-rich diets.

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References

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