

Winter Conference Live 2020, 8–9 December 2020, Micronutrient malnutrition across the life course, sarcopenia and frailty

Investigating the iron and zinc content of a popular meal in the diet of UK children and its contribution to daily micronutrient intake for females aged 11–14 years

M. Thomas¹, L. Coneyworth¹, J. Stubberfield¹, J. Pearce² and S. Welham¹

¹School of Biosciences, Faculty of Science, University of Nottingham, Sutton Bonington Campus, LE12 5RD and
²Food and Nutrition Subject Group, College of Business, Technology and Engineering, Sheffield Hallam University, Sheffield, S1 1WB, UK

Iron and zinc are essential dietary minerals fundamental for growth and development in adolescents^(1,2). Females at this life stage have increased physiological requirements due to the onset of puberty⁽¹⁾. Insufficiency of either mineral can have adverse effect on health including impaired immune competence⁽³⁾ and cognitive function⁽¹⁾. Increased autonomy of food choice may influence diet composition and mineral intake. Furthermore, socioeconomic status has been shown to be positively associated with micronutrient intake⁽⁴⁾.

In this study, secondary analysis of years 7 & 8 of the National Diet and Nutrition Survey (NDNS) was conducted to establish influence of income on mineral intake. Furthermore, micronutrient intakes of females aged 11–14 years were compared to Reference Nutrient Values (RNI) and adherence assessed. We then tested the hypothesis, meals made with ingredients derived from “economy” ranges contain lower levels of iron and zinc. The meal tested was Spaghetti Bolognese made with ingredients from economy and standard ranges from four large UK supermarkets.

Mineral content of homogenised and oven dried Bolognese meat sauce was determined via inductively coupled plasma- mass spectrometry (ICP-MS). The influence of cost on mineral concentration was evaluated using parametric tests.

Correlation analysis performed to test the potential influence of equivalised household income on mineral intake. Non- Parametric tests utilised to compare mineral intake across income quintiles. All data analysed in IBM SPSS v26.

Results from NDNS revealed 98 and 89% of females (n 130) daily dietary iron and zinc intakes were below the Reference Nutrient Intake (RNI) respectively, of this 85 and 68% were below the Estimated Average Requirement (EAR) respectively. Mineral intake increased with increasing income for iron (p 0.014) and zinc (p 0.028). When analysed by income quintiles (IQ) females in IQ 5 (n 22, >£43402.43) had a higher intake of iron (p 0.014) and zinc (p 0.004) compared to females in IQ 1 (n 23, <£12152.43). Bolognese made with Economy (n 12) had the least iron (0.90 ± 0.04 mg 100g⁻¹) and Standard (n 12,) the highest (1.07 ± 0.08 mg 100g⁻¹) although this did not reach significance (p 0.060). Standard Bolognese had the highest concentration of zinc (1.65 ± 0.10 100g⁻¹) and Economy the least (1.44 ± 0.05 mg 100g⁻¹) however, this did not reach significance (p 0.091).

Females aged 11–14 years; intakes of each mineral were low compared to the RNI with those in lowest quintile having a lower intake compared to Quintile 5. More studies are required to investigate the foods and food groups within the diet of adolescent females and potential influence food cost has on mineral intake.

Acknowledgements

This work was supported by the Biotechnology and Biological Sciences Research Council [grant numbers BB/M008770/1]

References

1. Gibson RS, Heath A-LM, Ferguson EL (2002) *Asia Pac J Clin Nutr* **11**(s3), S543–52.
2. Cleghorn G (2007) *Nutr Diet* **64**, S143–6.
3. Calder PC (2020) *BMJ Nutr Prev Health* **3**(1), 74–92.
4. Novaković R, Cavelaars A, Geelen A *et al.* (2014) *Public Health Nutr* **17**(5), 1031–45.