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Intakes of total, haem and non-haem iron in a nationally representative sample of teenagers (13–18 years) in Ireland

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Iron is an essential mineral involved in various metabolic processes within the body and is important for the maintenance of general well-being. Low intakes of iron may have notable implications for overall health, potentially leading to iron deficiency anaemia and consequent health effects such as lethargy and improper brain function. This can adversely affect academic performance especially during the teenage years when iron requirements are high[(1)]. The aim of this study was to investigate total, haem and non-haem iron intakes and dietary sources in Irish teenagers.

Analyses were based on data from the Irish National Teens' Food Survey II (NTFSII) (2019- 20; 13–18y; *n* 428) with detailed methods published elsewhere (www.iuna.net). Dietary intake data was collected using 4-day weighed food records, with total iron intakes previously estimated using Nutritics© based on UK and Irish food composition data[(2,3)]. Haem and non- haem iron were calculated separately based on the total iron content of foods, with haem iron attributed to 40% of iron derived from animal products[(4)]. Mean daily intakes of total, haem and non-haem iron were calculated for the total population and the contribution of food categories to these intakes were determined. Differences between males and females were also investigated.

Total, haem, and non-haem mean daily intakes of iron were 11.3 ± 5.6 mg/d, 0.6 ± 0.5 mg/d and 10.7 ± 5.4 mg/d, respectively. Males had significantly higher total, haem and non-haem iron intakes (13.0 ± 6.0, 0.7 ± 0.5, 12.3 ± 5.8 mg/d) compared to that of females (9.6 ± 4.6, 0.5 ± 0.4, 9.1 ± 4.5 mg/d respectively; $p < 0.001$). Haem iron contributed 5.6% and non-haem iron 94.4% to total iron intakes, this was similar across males and females. The main contributing food categories to total iron and non-haem iron were 'ready to eat breakfast cereals' at 21% and 'white bread & rolls' contributing between 11–12%. For haem iron, unprocessed red meat (29%) followed by processed white meat (26%) were the main contributors. Males had significantly higher contributions of total iron and non-haem iron from 'ready to eat breakfast cereal' and 'white bread & rolls' compared to females, whereas a significantly higher contribution from 'nutritional supplements' was observed for females ($p < 0.05$). No differences in the contribution of food categories to haem iron were apparent between males and females.

These findings indicate that non-haem iron is the most common form of iron being consumed by Irish teenagers, which is less bioavailable compared to haem iron. Further research is warranted to investigate other potential determinants of iron intakes and to assess the overall iron status of the population. As dietary patterns move towards a more plant-based diet it is important to ensure such changes do not have negative consequences in terms iron status in teenagers.

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