

Dietary sources of vitamin D in school children in Northern Ireland

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The primary sources of vitamin D are epidermal vitamin D synthesised via UVB exposure and dietary sources from oily fish, meat and fortified foods and supplements⁽¹⁾. In Northern latitudes (>37°), between September and March, sun exposure is insufficient to synthesise enough vitamin D, and dietary sources including the use of supplements, are important to meet requirements⁽¹⁾. The UK government currently recommends a 10 µg/day vitamin D supplement for children to maintain vitamin D status from October to March⁽¹⁾. The reference nutrient intake (RNI) for vitamin D is 10 µg/day; however, current mean(SD) intake is 4.2(3.1) µg/day⁽²⁾ and only 10% of children take a vitamin D containing supplement⁽³⁾.

This study investigates dietary sources of vitamin D in a convenient sample of school children in Northern Ireland. Secondary analysis investigated the relationship between age and vitamin D intake. Forty-four children were recruited between November 2019 and March 2020 as part of a larger study. Height and weight were measured, and daily vitamin D intake and consumption of vitamin D rich foods were assessed via a six-month retrospective food frequency questionnaire (FFQ)⁽⁴⁾.

The study cohort had a mean age of 8.1±2.1 years and 64% (28) were female. Mean(SD) height was 1.3(0.1) m, mean(SD) weight was 32.2(12.2) kg and the children's mean(SD) body mass index (BMI) was 17.6(3.2) kg/m². Mean(SD) dietary vitamin D intake, derived from the FFQ and including vitamin D supplement contribution, was 6.4(5.6) µg/day. Vitamin D intakes of children taking a vitamin D supplement (8, 18%; 16.5±4.3) were significantly higher than those not taking a supplement (36, 82%; 4.2±2.5), $p < 0.001$; 95% CI). There was no difference in vitamin D intake between boys and girls. The top five contributing food groups were as follows: breakfast cereals (1.3(1.0) µg/day), fish (1.0(1.2) µg/day), spreads (0.6(0.6) µg/day), meat (0.5(0.6) µg/day) and eggs (0.5 (0.5) µg/day). Age (years) was negatively correlated with vitamin D intake (µg/day) ($rs = -0.36$, $p = 0.02$) and supplement intake (µg/day) ($rs = -0.32$, $p = 0.033$).

Mean dietary vitamin D intake in this cohort was below the current recommendation, whereas those children who were taking a supplement met the daily recommendation. The food groups that contributed the most towards total vitamin D intake were vitamin D-containing supplements, fortified breakfast cereals, fish, meat, and eggs. Future public health messages need to focus on promoting vitamin D rich foods, including fortified foods, in addition to highlighting the importance of supplementation, particularly during the winter months. Mandatory vitamin D food fortification may need considered.

References

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