



Does fortification of more foods with vitamin D improve vitamin D intakes and status of groups at risk of deficiency in the UK?

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Parts of the UK population have poor vitamin D status, particularly those with low sun exposure and/or poor dietary intake. This study aimed to identify possible fortification vehicle(s) and level(s) most likely to increase population vitamin D intakes above minimum reference thresholds for intake and status without exceeding maximum reference thresholds.

UK food consumption data from the first two years (2008–10) of the National Diet and Nutrition Survey (NDNS) Rolling Programme⁽¹⁾ were manipulated to simulate the effect of fortifying wheat flour and milk-containing products with vitamin D at a range of levels between 2·5 µg and 30 µg vitamin D per 100 g flour; and 0·25 µg and 7 µg vitamin D per 100 ml milk. Empirically derived equations^(2,3) for the relationship between vitamin D intake and winter serum 25-hydroxyvitamin D [25(OH)D] levels were used to determine population winter serum 25(OH)D levels for each fortification scenario.

At a simulated fortification level of 10 µg vitamin D per 100 g wheat flour, the proportion of ‘at risk’ groups estimated to have vitamin D intakes below the UK Reference Nutrient Intake (RNI)⁽⁴⁾ was reduced from 93% to 50%, with no individual exceeding the European Tolerable Upper Intake Level (UL)⁽⁵⁾ for vitamin D and the 2·5th percentile of population winter serum 25(OH)D levels rose from 20 nmol/l to 27 nmol/l post fortification, above the UK minimum reference threshold of 25 nmol/l. Simulation of fortification of wheat flour at this level improved intakes across all socio-economic groups and was found to be more effective than fortification of milk, and simultaneous fortification of milk and flour.

This study provides new evidence that vitamin D fortification of a staple food such as wheat flour in the UK could be a viable option for improving vitamin D intakes and status of population groups at risk of deficiency without increasing the risk of exceeding current reference thresholds.

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