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The impact of replacing milk with plant-based alternatives on iodine intake: a modelling study

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Consumers are shifting towards plant-based diets, driven by environmental and health reasons. This has led to the popularity of plant-based milk alternatives (PBAs) that are marketed as being sustainable and good for health. However, these novel PBAs used as a replacement for cow's milk are often not fortified with the same essential minerals found in cow's milk[(1)]. Cow's milk is the primary source of iodine in the UK diet[(2)],and substituting with PBAs may negatively affect iodine intake. In this study, we estimated the impact of transitioning from a diet including cow's milk to one based on PBAs on iodine intake and adequacy.

The present study used the dietary modelling software DaDiet[(3)] to examine iodine intake in the diets of children aged 1.5–3 and 4–10 years and females aged 11–18 and 19–49 years. We used food consumption data from the UK National Diet and Nutrition Survey (2016–2019) and brand-level iodine concentration data. Several scenarios were conducted that accounted for the population impact of iodine fortification (0, 13, 22.5, 27.4 and 45 µg/100ml) during a transition to the consumption of PBAs.

For all population groups, replacing milk with PBAs that were either unfortified or fortified with 13 µg/100 ml would result in a meaningful decrease in usual iodine intake. The greatest impact was observed for toddlers, where the introduction of unfortified PBA resulted in a 58% reduction in iodine intake (127 to 53 µg/day). When replacing milk with PBA fortified at 22.5 µg/100 mL, the concentration most frequently present in the market, a 7% decrease in iodine intake was observed in children aged 4–10. There was no meaningful difference from baseline observed for other age groups. By contrast, the maximum fortification level would result in meaningfully higher intakes than the usual diet by 26 to 51 µg/day. However, adolescent females would still have a median iodine intake below the recommended daily intake (123 µg/day). Across all population groups, replacing milk with an unfortified PBA would result in a greater proportion of individuals with iodine intake below the Lower Reference Nutrient Intake (LRNI), with 28–48% of the population groups below the LRNI cut-off compared to 2–20% below the LRNI with the usual diet. However, 0% of the population exceeded the UK Upper Limit at any level of fortification.

Our results suggest that replacing cow's milk with commercially available PBAs has great potential to affect iodine intake at the population level, depending on the level of fortification. However, clear guidance is needed for both consumers and manufacturers to ensure iodine fortification is not overlooked. While giving room for studies with more complex replacement scenarios, our results may prove helpful in food system transformation planning and implementation.

References

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