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Practical food-based dietary guidelines developed for 12-24 month old New Zealand toddlers

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Background - Up to 33% of 12-24 month old urban New Zealand (NZ) children have sub-optimal iron status related to inadequate dietary iron intakes. Dietary intakes of other essential micronutrients are also often low in this population.

Objective - To develop practical food-based dietary guidelines (FBDGs) for 12-24 month old NZ toddlers that, if put into practice, will ensure adequate micronutrient intakes.

Design - Two sets of FBDGs were designed and tested using linear programming analysis and food consumption data (3-day weighed food records) recently collected from a representative sample of 12-24 month old urban South Island NZ toddlers (n=188). The FBDGs were distinguished on the basis of the inclusion or exclusion of fortified toddler foods. In this analysis, nutritional and palatability constraints were introduced, and deviations from observed food consumption patterns were minimised. This ensured nutritionally adequate FBDGs that were consistent with habitual food consumption patterns of NZ toddlers.

Outcomes - Practical FBDGs, which ensured nutritionally sound diets, were achievable only when fortified toddler foods were included in them. In these FBDGs, toddlers are encouraged to consume at least two toddler sized servings of foods from each of the cereal, dairy, fruit and vegetable food groups, as well as one toddler sized serving from each of the meat/fish/poultry/eggs/legumes and fortified toddler foods food groups per day. In addition, at least four toddler sized servings of carrots/pumpkin, and two of orange/kiwifruit/mandarin are recommended per week to ensure adequate intakes of vitamins A and C. FBDGs that exclude fortified toddler foods were designable. However, to ensure nutritional adequacy, they were necessarily prescriptive, which means adherence to them may prove difficult.

Conclusions - FBDGs that ensure nutritionally sound NZ toddler diets are only practical when they include a guideline for fortified toddler foods. The bioavailability of iron and zinc from these fortified toddler foods, however, is unknown. Hence, the efficacy of these FBDGs, for ensuring optimal micronutrient status of NZ toddlers requires further research.

How achievable are recommended dietary allowances for 12-24 month old New Zealand children?

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Background - Reported nutrient intakes of 12-24 month old New Zealand (NZ) children are often below the USA/Canadian recommended dietary allowances (RDAs).

Objective - To investigate whether RDAs are achievable with modest changes to NZ toddler diets.

Design - Dietary data (weighed records) collected from 12-24 month old NZ children (n=188) were analysed using linear programming analysis. In this analysis, the minimum dietary modifications required to achieve the RDAs for 13 nutrients, when feasible, were examined while allowing (1) modifications in the food portion sizes, (2) increases in red meat and (3) replacement of cows' milk with fortified toddler milk. All models minimised the difference between each child's actual and modelled food intakes while meeting constraints on dietary energy (child's reported intakes), nutrients (RDAs), and on the food portion sizes (up to twice the reported amounts). Unfeasible modelled diets did not meet at least one constraint.

Outcomes - Before modelling, only 7% of the reported toddler diets achieved all RDAs. Iron was the most difficult RDA to achieve (15% achieved it) followed by Ca (71%). Only 39%, 46% and 78% of modelled diets were feasible after allowing changes in the food portion sizes, red meat intakes and the type of milk, respectively. The most common changes (expressed as a % of diets in which they were present) were increased amounts of fortified breakfast cereals or milo (9-75%), meat/fish/legumes (4-30%) and milk (20-26%) with corresponding decreased amounts of milk (8-59%), other beverages (1-18%) and cakes/biscuits (1-15%), depending on the model run.

Conclusions - Achievement of the RDAs in toddler diets, especially for iron, is difficult given their small appetites relative to high nutrient requirements. Implications for nutrition planning and promotion become important, if achievement of the USA/Canadian RDAs in NZ toddler diets is our desired aim.