NUTRITION

Sources of micronutrient supply in the UK

Nutrient security in the United Kingdom appears to be stable and secure, but it is unclear whether this will continue to be the case if dietary patterns change, or if new trade arrangements emerge.

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In recent years, those interested in the problems of hunger and malnutrition have shifted their focus from food security to food and nutrition security or even to nutrition security on its own[1]. This reflects a change in emphasis from food availability and particularly a sufficiency of calories to a greater emphasis on the nutritional value of food and the quality of diets. Nutrition security, which encompasses food security, puts a particular focus on nutrient content. This change in emphasis, in turn, has been driven by a greater understanding of the links between diet and diet-related diseases, which in many cases are driven by a lack of micronutrients such as vitamin A, iron or zinc.

Evidence collected in the United Kingdom by the Health and Food Supplements Information Service (HSIS), an industry-funded resource, based mainly on the National Diet and Nutrition Survey (NDNS) and Department for Environment, Food and Rural Affairs (Defra) Family Food statistics, found that the intake of several micronutrients such as vitamin A, vitamin D, iron, calcium and potassium fell over the past 20 years while the intake of zinc increased[2]. Absolute deficiencies appear to be concentrated in specific vulnerable groups[3]. But with diets changing rapidly under the influence of changes in food habits and dietary recommendations, is there a risk that micronutrient deficiencies might become a more serious issue in the future?

Now, writing in *Nature Food*, Poppy and colleagues[4] examine this question for the United Kingdom from several angles. Their first contribution is to provide a long time-series (1961–2017) of the intake of five micronutrients (vitamin A, vitamin C, iron, calcium and zinc) drawing on Food and Agriculture Organization (FAO) food balance sheet data classified according to six sources for these micronutrients. They distinguish between micronutrients from animal-source foods, fruits and vegetables, and other plant-based sources, and in each case between domestic UK sources and imported sources of supply. This allows them to examine changes in the status of nutrient security and in the sources of micronutrients in the UK diet over this long period of time.

Overall, the authors find that nutrient security has remained stable and secure over the past 60 years or so. Although their macro approach is open to the criticism that what they are measuring are the micronutrients supplied by the commodities and not the nutrients available to each individual, the fact that they find micronutrient security is at least 150% for each of their five nutrients gives added confidence to this conclusion. Over this long period, imports became a more important source of vitamin A and vitamin C with fluctuations, but no obvious trends for the three minerals. Also, plant-based foods became a more important source for vitamin A, iron, calcium and zinc, with no obvious trend for vitamin C where almost 90% is derived from plant-based foods in any case.

In a second contribution, the authors make use of specially tabulated UK trade data on imports of fruits and vegetables to identify the dependence of UK consumers' micronutrient supply on specific commodities from specific exporting countries. The data they use for 2017 represent the supply situation just before Brexit. There is a particular interest in identifying the importance of European Union (EU) suppliers given the potential disruption to these trade flows arising from the UK exit from the EU.

As an example of their findings, the authors conclude that fruit-and-vegetable-based imports from the EU contribute 43.7% of the Uinted Kingdom's imported fruit-and-vegetable-based vitamin A supply. In turn, this represents 18.3% of the UK population's vitamin A requirement, where the total supply equals 167.1% of the vitamin A requirement. In this way, the dependence of the United Kingdom on the EU for its needs of the five micronutrients and the vulnerability of its nutrition security to any disruption in this trade can be revealed.

The analysis also shows the contribution of different commodities to micronutrient supply. For example, imported bananas provide 44.2% of the UK population's requirements for vitamin C for which the population is 299.7% secure, compared with 8.6% of its requirements for vitamin A for which the UK is 167.1% secure.

The authors propose that their analysis using these two 'uncertainty axes', namely animal-source versus plant-based foods (including fruits and vegetables) and domestic versus imported supplies, could be the starting point for future scenario analyses. These could evaluate the consequences for nutrient security of specific dietary trends or dietary recommendations, as well as for future post-Brexit trade arrangements.

For example, the EAT–*Lancet* diet[5] proposes a substantial shift to eating largely plant-based foods. The consequences of encouraging this dietary shift for nutrient security could be examined using the authors' approach. This could also take account of changing UK consumer preferences, for example, for a broader range of fruits and vegetables, which could lead to changes in the relative importance of domestic and imported sources of supply. Such a scenario analysis could allow for a more fine-grained assessment of sources of future vulnerability for nutrient security, for example, if supplies from an important exporter were likely to be subject to disruption due to more frequent droughts.

The authors present this UK analysis as a case study that could be replicated for other countries given that the principal data inputs are FAOSTAT food balance sheet data as well as widely available international trade statistics. An important step in this process is the conversion of FAOSTAT commodity data (for example, for wheat) into appropriate 'food baskets' of products that are actually consumed to correctly calculate their micronutrient content. These food baskets will be specific to individual countries and may also differ between domestically produced and imported commodities, something that is

not considered in the analysis by Poppy and colleagues.

It would be useful to cross-reference and compare the micronutrient availability derived from this macro approach with estimates from the UK dietary surveys. In developed economies, micronutrient deficiencies are more likely to be found in specific population sub-groups that will not be picked up by looking at national average intakes[6], but changes in national average intakes can act as an indicator variable to flag when potential problems might arise.

The work of Poppy and colleagues broadens the UK food policy debate beyond the traditional concerns with food security to also consider nutrition security. This stands in contrast to the recent UK National Food Strategy report[7] that makes no mention of either micronutrient deficiencies or nutrition security, despite the increasing evidence that micronutrient deficiencies may have been a risk factor for COVID-19[8]. ❐

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Competing interests

The author declares no competing interests.