Global iodine status has improved: but we must not be complacent

(First published online 20 February 2017)

I deficiency has been described as the single greatest cause of preventable mental impairment(1,2). I is an essential nutrient necessary for the production of thyroid hormones, which control metabolic processes and growth and development, especially of the brain and central nervous system(2). I deficiency is a global problem affecting both developed and developing countries; however, in the recent years there has been excellent progress in improving global I status. The most recent Iodine Global Network (IGN) scorecard (2015) designates twenty-six countries, including Ireland, as I insufficient compared with 116 countries in 1993(3,4).

In a recent issue of the British Journal of Nutrition, McNulty et al.(5) presents the I intake and status of the Irish population using data from the Irish National Adult Survey (2008–2010)(6) and the Irish Total Diet Study (2012–2014)(7). The median urinary iodine concentration (UIC) for the Irish adult population was 107 µg/l, which is within the range of 100–199 µg/l recommended by the World Health Organization for dietary adequacy for adults and children(8,9). Thus, at a glance, it might appear that the population now has an adequate status, which seemingly indicates there is no cause for concern.

However, the assessment of I status is far from straightforward. There is currently no definitive method to assess the I status of an individual. Furthermore, thyroid hormones are not good measures of I status as populations with suboptimal status can have concentrations within normal reference ranges(10). The WHO recommends assessing the I status of a population using a spot sample of urine. The median UIC of a population is then compared with recommended cut-offs. The IGN defines the I status of a country based on the UIC of school-aged children (≥6 years of age) and the Irish data date from 1999(4).

School-age children would need to be surveyed for the IGN to review the I status of Ireland. In other developed countries such as Australia and New Zealand UIC is higher in school-aged children than adults(11). Although children’s dietary intake of I is lower their urine is much more concentrated than adults, although both have the same cut-offs to indicate deficiency (median UIC 100 µg/l). It has been argued that the median UIC cut-off for deficiency in adults should be lower at 60–70 µg/l(12), which would put the Irish adult population well into the sufficient category. It is probable that the population assessment based on school-aged children would indicate sufficiency.

Recent research has found that when I status is sufficient in school-age children, there could still be deficiency in pregnant and breast-feeding women in the same population(13,14). McNulty et al.(5) found that 66% of women achieved the Institute of Medicine’s estimated average requirement (EAR; 95 µg/d) for I, although intakes were lowest in women aged 18–35 years(15). I requirements increase significantly during pregnancy to meet both maternal and fetal needs and increased maternal renal loss(16); I is also secreted into breastmilk thus maternal requirements are high during lactation(17). Using current intakes, 77% of Irish women of childbearing age (18–50 years) would have intakes below the EAR for pregnancy (160 µg/d)(18). Thus, even with increased food intake during pregnancy, many of these women would be unlikely to achieve an adequate intake of I if they became pregnant. It is well established that severe I deficiency during pregnancy can result in cretinism in the infant, characterized by serious mental and physical impairment; this is not likely to occur in Ireland at the observed intakes. However, even mild to moderate deficiency in early life may affect neurobehavioural development. Thus, it is essential that I status is monitored not only in school-age children but also in both pregnant and breast-feeding women.

In other countries where intakes are sufficient for children but suboptimal for pregnant and breast-feeding women supplementation is recommended for these women(19). It has also been suggested that the IGN global score card should reflect both school-age children and pregnant women(14).

McNulty et al.(5) demonstrated that milk was the main dietary source of I and I status was higher in the winter than the summer (median UIC 152 ± 108 µg/l, respectively). Levels of I in Irish milk are currently bolstered by farming practices, which involve the use of I-containing compounds in dairy sanitation; winter intakes are further increased by salt licks and fodder for dairy cows enriched with I. Any change to these practices could markedly influence the I intake of the Irish population. Moreover, European Food Safety Authority (EFSA) has recommended reducing the levels of I permitted in complete animal feed from 5 to 2 mg/kg, which could reduce human I intake in Ireland(20). It is essential that Ireland continue to monitor the I content of milk in order to prevent I deficiency, but also I excess. Further research should also consider individuals who exclude milk from the diet.

In conclusion, the recent work by McNulty et al.(5) suggests that for the majority of Irish adults I status is currently sufficient, although intakes in women of childbearing age are the lowest and of concern. It is essential that I status is now assessed in children and also pregnant and breast-feeding women; supplementation may be required during pregnancy and lactation. As milk is the major source of I in Ireland it is vital that both the I content of the diet and also I status of the population continues to be monitored, as changing farming practices could
dramatically influence status. This Irish study is a comprehensive example of the complexities of assessing I status. There has been much progress in improving global I status among school-aged children in the recent years; however, sufficient I status is not something that can be taken for granted. Population I status is vulnerable to farming practices, changes in the food supply and also individual dietary choices. We must continue to evaluate both I status in the population and also dietary sources of I. Sufficiency in one group does not equate to sufficiency in all groups and the use of school-age children alone to determine the status of the whole population needs to be reconsidered.

Louise Brough

Massey Institute of Food Science and Technology
School of Food and Nutrition
Massey University
Palmerston North 4442
New Zealand

email l.brough@massey.ac.nz
doi:10.1017/S0007114517000113

References