

The importance of iodine in the UK diet: relevance of milk and dairy products

Professor Margaret P Rayman

Professor of Nutritional Medicine, University of Surrey

Iodine deficiency is present in certain groups of the UK population, most notably in pregnant women; this is of considerable concern as iodine is required for the synthesis of thyroid hormones that are crucial for brain and motor development of the growing baby. Iodine status (i.e. level of iodine in the body) is assessed by measuring the iodine concentration in urine. Based on a 2011 national study of urine samples from 14–15 year old schoolgirls, the UK has recently been classified as mildly iodine deficient by the World Health Organization (WHO).

As pregnancy is the most critical time for brain development, our group evaluated iodine status in UK pregnant women (in Surrey and Oxford), finding that levels of iodine in urine were somewhat lower than the WHO cut-off for adequacy in pregnancy (150 µg/L). We then investigated whether that level of iodine deficiency could be associated with adverse effects on child brain development using stored samples and data from the large UK ALSPAC (Avon Longitudinal Study of Parents and Children) cohort study. We found a significant association between low iodine status in the mothers in early pregnancy and their children's brain development; children whose mothers were iodine deficient in pregnancy (67% fell into that category) had an approximately 60% greater risk of being in the bottom quarter of scores for intelligence quotient (IQ), reading accuracy and reading comprehension. The more severe the level of iodine deficiency in the mother, the worse were the effects on IQ and reading comprehension.

Most countries get iodine from three sources, diet, supplements and iodised salt. The UK is unusual in getting most of its iodine intake from milk and dairy products; iodised salt is neither widely available nor consumed. Interestingly, UK milk is a richer source of iodine than is milk in most other countries. This is because our dairy cattle receive supplements that contain iodine in the winter when they are in barns rather than grazing outdoors. Organic milk does not have the same high iodine concentration owing to lack of supplementation in winter feed. Somewhat worryingly, UK sales of milk-alternative drinks (e.g. soya milk) have increased in recent years. Although many such drinks are fortified with calcium to match the calcium content of milk, our group has shown that just three of 47 such drinks were fortified with iodine, the rest having almost no iodine content. Hence, individuals who consume these drinks in preference to cows' milk may be at risk of iodine deficiency and may be unaware of the consequences for their babies' cognitive and motor development.

UK women of childbearing age who might become pregnant need to ensure that they have an adequate iodine intake from dietary sources (mainly milk, dairy products, fish and eggs) to avoid compromising their children's brain development.