Iodine and Folate –vital for mothers-to-be

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The National Diet and Nutrition Survey (NDNS) is designed to assess the diet, nutrient intake and nutritional status of the general population aged 1.5 years and over living in private households in the UK. The NDNS is jointly funded by Public Health England, an executive agency of the Department of Health, and the UK Food Standards Agency. The most recent survey, published in 2018, related to years 7 and 8 i.e. 2015-2015. The data indicated that "The median urinary iodine concentration for women of childbearing age (16 to 49 years) in Year 7 and 8 (combined) was 102µg/L with 17% of the population below 50µg/L. While these values met the WHO criterion for adequate intake for the general population, they do not meet the criterion for iodine sufficiency in pregnant and lactating women (i.e. median urinary iodine concentration within 150-249µg/L)" (1). This is a significant public health issue affecting up to 50% of newborns and urgently requires corrective strategies.

The UK has started the implementation process to introduce the mandatory fortification of flour with folic acid. Spina bifida due to folate deficiency is very noticeable but the effect of iodine deficiency on foetal brain development is not so visible (2). Maternal iodine intake should be adequate before conception, through gestation (particularly the first trimester) and lactation. Even mild iodine deficiency in pregnancy may lead to lower IQ, as well as cognitive and behavioural problems in childhood as a result of inadequate delivery of maternal thyroxine to the developing foetal brain. UK data have confirmed that significant reduction in IQ of between 2 and 6 points is associated with suboptimal iodine status in pregnancy (3). Uncorrected this will have substantial negative economic and social impact.

What is the current dietary iodine status in the UK? The non-pregnant population requires 150µg iodine per day but in pregnancy this requirement rises to around 250µg.The UK Iodine group (a committee of experts in thyroid, nutrition and public health with the aim of ensuring that iodine deficiency is eradicated in the UK [4]) emphasises that dietary sources of iodine are very important. In the UK, cows' milk is a critical source of iodine. Milk-alternative

drinks e.g. soya or almond, which have a very low iodine concentration are not suitable. White fish are a rich source of iodine (5). However data from the NDNS show that fish intake is low, particularly among young women and is more expensive than milk and dairy products. While some pregnancy vitamin supplements contain an adequate amount of iodine many do not.

Universal salt iodisation (USI) both helps to provide iodine for the general population and to achieve the necessary increased iodine requirement in gestation. There are now more than 100 countries worldwide with voluntary or mandatory iodised salt provision due to the associated efforts of WHO, UNICEF and IGN (Iodine Global Network) as well as UK government support via the Department for International Development (DFID). This results in positive effects on population IQ, yet the UK has still not achieved the appropriate standard (6). In fact, the UK is one of only around 10-15 iodine deficient countries in the world with no USI. Indeed, the UK and Russia are the only advanced economies with iodine deficiency not to have introduced USI.

Household consumption of salt, as the main source of salt intake, is reducing world-wide. In the UK, the main source of salt is from processed food, manufactured outside the home. In some countries (Australia and New Zealand) where USI has not been implemented, use of iodised salt in factory bread production has resulted in adequate iodine nutrition in all population groups. The authors however also understand the paradox of advocating USI at the same time as reducing salt intake in the general population. The associated concerns have been appropriately addressed by statements from WHO and other authorities (7). The introduction of USI is also not a barrier to achieving the reduction of salt consumption in the UK population from 8g/day to 6g/day.

Unfortunately, current knowledge of iodine requirements in pregnancy in the UK is very low (8). We urge that efforts should be made to raise awareness of the importance of adequate iodine nutrition, especially in pregnant women and women of childbearing age. If iodine supplements are consumed, a dose of 150 micrograms of Potassium Iodide and not more should be taken. Kelp, which has unreliable iodine concentrations, is not recommended. Supplementation should ideally be started some three months prior to conception and continued throughout pregnancy and breastfeeding.

As the consumption of processed food is increasing (9), introduction of iodised salt in manufactured food as well as adding iodine to household salt should be advised. We support that DFID is aiding salt-iodisation in some developing countries, but it is surely time the UK itself recognised international standards of iodisation to protect the IQ of our future generations. A one point IQ drop in the USA has been estimated to cost the economy 20 billion US dollars per year (10).

The Government's decision to recommend consultation on fortification of UK flour with folic acid was made in 2018, 27 years after the evidence of spina bifida in babies from folate deficient mothers was available. Despite this delay it seems that policymakers may relate more to the 'visible' problem of spina bifida rather than to the 'invisible' problem of a 1-2 point decrease in IQ due to iodine deficiency in the population. We continue to ignore the importance of iodine to the detriment of the future of the UK.

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