

Risk Assessment Study on Dietary Iodine Intake in Hong Kong Adults Frequently Asked Questions and Answers for the Public

I. About the study

1. Why was the study conducted?

The study was conducted because the World Health Organization (WHO) considered iodine deficiency a worldwide public health problem. Furthermore, locally the Expert Panel Group on Iodine Deficiency Disorders (IDD) in Hong Kong published a consensus statement in 2003, which stated that borderline iodine deficiency existed in the expectant mothers and urged for a comprehensive survey on iodine content of local food items.

2. What are EAR, RNI and UL?

The Estimated Average Requirement (EAR), the recommended nutrient intake (RNI) and the tolerable upper intake level (UL) are dietary reference intakes set by international or national authorities. EAR is the average daily nutrient intake value estimated to meet the needs of 50% healthy individuals in a given age and gender group. RNI is the daily intake (i.e. EAR plus 2 standard deviations) meeting the nutrient requirements of almost all (97.5%) apparently healthy individuals in an age- and gender-specific population group. UL is the maximum intake from food, water and supplements that is unlikely to pose risk of adverse health effects from excess in almost all apparently healthy individuals in an age- and gender-specific population group. The range of intakes between RNI and UL (i.e. safe range) is considered sufficient to prevent deficiency while avoiding toxicity. An UL is not a threshold of toxicity but may be exceeded for short periods without an appreciable risk to the health of the individual concerned.

3. What are the salient findings of the study?

The levels of iodine in the sampled foods varied from not detected to 2,900,000 μg per kg of food. Using the mean food intake of the 2 non-consecutive 24-hour dietary recalls (24-hr recall) from the Hong Kong Population-based Food Consumption Survey (FCS) 2005-2007 for the population aged 20-84 years, the median iodine dietary intake from the 11 food groups in adults was estimated to be 44 $\mu\text{g}/\text{day}$. Around 59% of the adult population had iodine intakes below 50 $\mu\text{g}/\text{day}$, the threshold for normal thyroid functioning. Only 5% adult population had iodine intake at the safe range, 93% had intake below RNI (150 $\mu\text{g}/\text{day}$) and 2% had intake above UL (1000 $\mu\text{g}/\text{day}$) established by the Chinese Nutrition Society for adults (excluding pregnant/ lactating women) 18 years and above.

4. What are the main sources of dietary iodine intake in the adult population?

The food groups with rich iodine content were seaweeds, condiments & sauces particularly iodised salt, crustaceans and molluscs, egg/ egg products, milk/milk products, fish, and sashimi & sushi. The top 5 iodine contributors were seaweeds (46%), sashimi & sushi (16%), non-alcoholic beverages & soups (11%), fish (8%) and crustaceans & molluscs (5%).

II. About iodine and health

1. What is the function of iodine in human body?

Iodine is an essential nutrient required for human. It is necessary for the synthesis of the thyroid hormones which play a key role in regulating various metabolic functions in the body. Iodine deficiency may lead to goitre, hypothyroidism, abnormalities in the growth and the development of the brain and central nervous system in infants and children.

2. How much iodine do we need from the diet?

Iodine is a trace mineral and only a very small amount is needed. However, the body needs iodine regularly because it cannot be stored in large amounts. Children need less iodine whereas pregnant/ lactating women need more to provide their baby's need. WHO recommends the intake of iodine for different age-groups as follows:

- preschool children (0 to 59 months) 90 μ g/day
- schoolchildren (6 to 12 years) 120 μ g/day
- adolescents (above 12 years) and adults 150 μ g/day
- pregnant and lactating women 250 μ g/day

3. What is IDD?

Iodine deficiency occurs when iodine intake falls below recommended levels. The thyroid may no longer be able to synthesize sufficient amounts of thyroid hormone. The resulting low level of thyroid hormones in the blood (hypothyroidism) is the principal factor responsible for damage to the developing brain and other harmful effects known collectively as "iodine deficiency disorders" (IDD). In all ages, goitre, hypothyroidism, and an increased susceptibility to nuclear radiation may happen. In addition, the spectrum of IDD differs in:

- foetus (e.g. congenital anomalies, perinatal mortality),
- neonate (e.g. endemic cretinism including mental deficiency),

- child/adolescent (e.g. impaired mental function, delayed physical development), and
- adult (e.g. impaired mental function, iodine-induced hyperthyroidism).

III. About food (including supplements, excluding salt) and iodine

1. Can you give some practical examples on the amount of seaweed/seaweed products one can eat so as to meet the daily iodine intake recommendations?

There are many types of seaweeds 藻類 and products, e.g. laver or nori 紫菜 used in nori sheet for sushi, seaweed snack 零食紫菜, and agar agar 大菜 in desserts. They could be eaten in MODERATION. For example, about 2 small bags (1.1g seaweed per bag) OR 1 medium packet (2.5-3.0g seaweed per packet) of seaweed snack 零食紫菜 is enough to meet the iodine requirement of 150µg/day.

However, some seaweeds contain very high levels of iodine, e.g. kelp 海帶, kombu 昆布, wakame 裙帶菜. Generally speaking, they are SAFE for adults if consumed in MODERATION, such as not more than once a week or so of one serving. The Food Standards Australia New Zealand advises the public not to over consume these items for a long time as they can adversely affect thyroid function.

2. Should supplements containing iodine be recommended to consumers?

Care needs to be taken when considering iodine supplementation as it may lead to an intake of iodine beyond the UL (1000 µg/day). For children and the general population, iodine supplements are generally not recommended unless consulted with the medical professionals. As iodine is especially important for the foetus and young children, besides eating foods which are important sources of iodine and using iodised salt in the diet, women who are pregnant, lactating or considering becoming pregnant should ask their doctor or dietitian for advice on their individual needs of iodine supplements.

IV. About salt (including iodised salt) and iodine

1. Will the consumption of iodised salt cause thyroid cancer?

Currently, there is no scientific evidence showing that iodised salt is a causative agent of thyroid cancer.

2. How to prevent the iodine loss in iodised salt during storage and cooking?

Iodine in the iodised salt will be lost due to moisture, humidity, exposure to heat and sunlight, and so on. To retain the maximum amount of iodine in salt,

- add iodised salt just before serving the food, and
- store iodised salt in a tight, coloured container at a cool, dry place.

3. What are the adverse effects of consuming too much salt?

Consuming 5-10 g/day iodised salt will add an extra 150-300 µg/day of iodine to one's diet, however excessive intake of salt is not recommended. Many studies revealed that excessive intake of salt could lead to hypertension (high blood pressure) and increased risk of cardiovascular disease. In order to prevent chronic diseases, WHO recommended that salt intake should not exceed 5g/day.

4. Is there any health concern on iodised salt?

Currently, there is no known adverse health concern on consuming iodised salt for the apparently healthy individuals, however people allergic/sensitive to iodine or with thyroid problems shall seek doctor advice prior to consuming iodised salt.