A-27: Determination of iodide levels in iodized and non-iodized salts available in the local market and fate during boiling, washing and exposure to sunlight

J H Wimalasena, S P Deraniyagala, V M Thadhani
(Dept. of Chemistry, University of Sri Jayewardenepura, Nugegoda)

Iodized salt has been the most practical, effective and satisfactory means for correction of iodine deficiency disorders (IDD). This preliminary investigation was undertaken in the hope that it may contribute, at least in part, to assess the effectiveness of the iodization programme in Sri Lanka.

In this study, 12 brands of salt labelled iodised and 4 brands of salt not labelled iodized, available in the local market were chosen. Total of 5 samples were analysed from each brand collected from at least 2 different locations. Salt samples were dissolved in double distilled water and iodide levels determined colorimetrically at 420 nm based on the iodide catalyzed reduction of Ce(IV) by As (III) in acidic medium.

This study revealed that the iodide levels in non-iodized and iodized salts fall in the range 13-19 ppm and 40-55 ppm respectively. The recommended content of iodide in salt in Sri Lanka for human consumption is 50 ppm at the manufacture level and 25 ppm at the retail and household levels. Based on this information it is evident that a person consuming salt in the usual range (WHO recommends 6 g/day as precaution against hypertension), will not receive the daily requirement of iodide (150 μg/day) with non iodized salt. Hence part of the daily requirement has to be met by the intake of iodine rich food. In contrast, iodized salt will fulfil the daily requirement and together with food and water may well exceed the required level. Although the condition known as hyperthyroidism or thyrotoxicosis has been reported in a few adults (whose thyroids have become adapted to low iodide intake). Following the introduction of the iodization programme in several countries, intake upto 1000 μg/day is considered to be safe for adults.

A considerable loss of iodide has been observed when boiling (>90%, t=45 min) and washing (>60%) of iodized salt when compared to the effect of sunlight (~8%).

The successful implementation of the iodization programme will thus depend on the changing habits of the population (washing of granulated salt, adding salt before cooking of food etc.) and the role played by the salt industry.

Based on these findings it can be concluded that in Sri Lanka, optimum level of iodide in salt appears to be around 50 ppm. All salt for human consumption must be iodized The salt should be added to food after cooking without washing at room temperature. Hyperthyroidism in the present generation (in a very few) is the price that has to be paid for better mental and physical development of generations to come.