Estimation of Iodine in Selected Commonly Consumed Philippine Vegetables and Aquatic Products

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Introduction

The main role of iodine in nutrition arises from the normal production of thyroid hormones to the growth, development and metabolism of humans. Excess iodine or inadequate iodine can lead to symptoms of hyperthyroidism or hypothyroidism. The need for additional iodine data in local foods is essential for accurate estimation of presence or absence of iodine deficiency or iodine excess of the Philippine population. It can also be the basis for the formulation of nutrition intervention programs to prevent or reduce the increasing incidence of iodine deficiency disorders. The study aimed to quantitatively estimate the iodine content of selected commonly consumed Philippine vegetables and aquatic food products using optimized, developed and validated extraction and spectrophotometric method for quantification of iodine in food.

Materials & Methods

Food samples (see Figure 1) were taken from three (3) collection points generally wet markets, supermarket or groceries located in Metro Manila. Approximately 1.5 to 3.0 kilograms of the sample were purchased from the selected markets depending on the estimated edible portion. All standards, chemicals and reagents used and purchased were analytical grade. SEAL Flow Auto Analyzer 3 (AA3) with AACE 6.07 Seal Analytical software was used for the detection of iodine. About 0.5 to 5.0 grams of homogenized samples underwent the following procedure as shown in Figure 2.

Figure 1: Selected commonly consumed vegetables & aquatic products.

Figure 2: Procedure conducted for the iodine analysis of samples.
Using the Sandell-Kolthoff reaction and the auto-analyzer, thirty-six (36) vegetable samples and thirty-four (34) aquatic products were analyzed for moisture and iodine. *Dilis Tuyo, Alamang Tuyo, Tamban Tuyo* obtained the highest iodine content among the processed aquatic products. *Salay Ginto, Tahong (large)* and *Lapu-Lapu (red)* obtained the highest iodine content among fresh aquatic products.
Among the analyzed vegetables, lettuce (green ice), bawang, and siling mahaba berde, obtained the highest iodine content, while arosep has the highest iodine content among seaweeds vegetables.

The levels of iodine in seaweeds, fishes and other aquatic products such as dried fish or shellfish can possibly be significant sources of dietary iodine.

The analyzed iodine concentration in vegetables were very low (0.00 to 24.60 mg/100g) compared with the seaweeds (300.00 to 2900.00 mg/100g). This was probably due to low concentration of this element in the soil.

The results of the analysis of iodine in selected vegetables and aquatic products can provide basis for dietary intake assessment and formulation of proper health and nutrition intervention programs for the reduction of the incidence of iodine deficiency disorder.

Method development and validation studies using inductively coupled plasma-mass spectrometry (ICP-MS) are recommended for determination of very low concentration of iodine in complex food matrices.

Further investigation on the concentration of iodine in food considering the factors such as the geographical location, seasonal variation and other environmental variables.

Expand the analysis of iodine in other food sources particularly in milk and milk products, cereals, fruits and other commonly-consumed processed foods.

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