# **IODINE**: *Why Supplementation in Pre-natal Vitamins is Necessary*

*By Rachel Reid, Dietetic Intern 2010*

## Function of Iodine:

Iodine is an essential part of the thyroid hormones thyroxine (T4) and triiodothyronine (T3). During both the prenatal and postnatal periods, these hormones regulate the development of tissues, particularly those in the nervous system. Therefore, Iodine is essential for the neurocognitive development of a child. Thyroid hormones maintain regular metabolic processes in adults.

## History:

In the 1920s, iodine deficiency was common and widespread throughout the United States (1). Those living in landlocked areas who did not consume seafood or farm on iodine rich soil suffered from iodine deficiency. Areas where iodine deficiency was most prevalent were named "a goiter belt". To treat and prevent further iodine deficiency in the US, iodine was added to salt. Since this modification, symptoms of this deficiency are no longer seen in the United States; therefore, it has been assumed iodine intake is sufficient.

## Deficiencies in Iodine:

According to researchers, iodine deficiency affects 2.2 billion people worldwide, and is the leading cause of mental retardation. Though the United States rarely sees severe cases of iodine deficiency, mild deficiency can lead to low intelligence in children.

## Recommendations for Iodine:

The Institute of Medicine recommends an intake of 150 mcg of iodine per day for adult men and women (1). Due to the higher demand for iodine during pregnancy and lactation, the recommendation is 220 mcg per day for pregnant women and 250 mcg per day for breastfeeding women.

Urinary iodine excretion is recognized as a valid way to determine iodine intake, as most iodine that is absorbed into the body is excreted into urine. Urinary iodine concentrations of 150 – 249 ng/ml would represent adequate iodine intake.

## Iodine Deficiency in America:

According to the 2003 – 2004 NHANES Survey, iodine consumption has significantly decreased since the NHANES Survey I conducted from 1973 – 1974 (2). Median urinary excretion for women of reproductive age decreased from 300 ng/ml in 1973 -74 to 139 ng/ml in 2003 - 04. This indicates that in the US, the median intake in iodine of women of reproductive age is less than what is recommended to be adequate for pregnant women.

The average sodium intake for Americans is about 4800 mg, which is double the Recommended Daily Allowance (RDA) of 2400 mg. It has been estimated that 1 teaspoon of salt (2400 mg of sodium) contains about 400 mcg of iodine, which provides an individual with more iodine than the RDA (150 mg). Since the salt intake in America is high, the decrease in intake of iodine is puzzling.

## A Closer Look at the Salt Used in America:

A recent study determined that iodine content of salt may not be as high as it claims to be on the label (3). This study determined that 53.5% of salt samples from 88 randomly chosen packages contained below the US FDA lower limit for recommended iodine content. Each sample contained highly variable amounts of iodine, indicating that quality control of the amount of iodine are not sufficient to produce a standard product.

Also, American's high salt intake largely results from high consumption of processed foods. These processed foods have been determined to use un-iodized salt. The use of sea salt (usually un-iodized) has also been on the rise. Therefore, even if a person's salt intake is high, their iodine intake may not always be sufficient.

These findings suggest that 1 teaspoon of salt per day may no longer provide adequate iodine for pregnant and lactating women.

**Status of Iodine in Pre-Natal Vitamins:**

Iodine content of prenatal vitamins is not mandated by the United States government. The New England Journal of Medicine determined that out of the 233 varieties of prenatal vitamins sold, only 51% contained a sufficient amount of iodine (150 mcg). According to a recent study (4), it was determined that the actual amount of iodine in these vitamins is highly variable. In this particular study, the average iodine concentration of 60 randomly selected vitamins claiming to contain 150 mcg of iodine, was 119 mcg/vitamin.

**Conclusion:**

Though one would assume iodine intake would be adequate due America's high salt intake, it has been determined that quite the opposite is true. Iodine intake has dropped in the past three decades due to the increased consumption of processed foods and lack of regulation in the production of iodized salt. Due to iodine's important role in neurocognitive development of infants, it is essential that women take pre-natal vitamins containing at least 150 mcg of iodine.

**References**: (1) American Thyroid Association www.thyroid.org (2) K.L. Caldwell, G.A. Miller et al., "Iodine status of the U. S.Population, National Health and Nutrition Examination Survey 2003-2004", *Thyroid*, 18, pp. 1207-1214 (2008). (3) P.K. Dasgupta, Y. Liu et al., "Iodine nutrition: Iodine content of iodized salt in the United States", *Environ Sci Technol*. 42, p. 1315 – 1323 (2008). (4) ht tp: / /www. thy roid.org/profes s ional s /publ icat ions /news/09_02_25_pearce.html: site visited September 15, 2009.