

Thank you for giving us the opportunity to submit a comment for review by the Dietary Guidelines for Americans Committee (DGAC). The following comment is being submitted jointly from the following five organizations: the American Association of Clinical Endocrinologists (AACE), the American Thyroid Association (ATA), the Endocrine Society (ES), the International Council for the Control of Iodine Deficiency Disorders Global Network (ICCIDD), and the Teratology Society (TS).

Our comment focuses on the importance of adequate iodine intake during pregnancy and breastfeeding to ensure adequate neurocognitive development in the fetus and developing infant. Over the last four decades there has been a marked decline in dietary iodine intake in the U.S., resulting in iodine deficiency (ID) among pregnant women in recent national surveys. Currently, many women of childbearing age do not meet the recommended intake for iodine.

1) Importance of iodine

- iodine is an essential trace mineral in humans required for production of thyroid hormone
- dietary and supplemental iodine intake are the sole sources of iodine
- severe ID results in goiter, hypothyroidism, intellectual impairment, growth retardation, pregnancy loss, and increased infant mortality (1)
- mild-to-moderate ID has been linked to increased thyroid disorders and impaired cognitive function (2)

2) Assessment of iodine status

- Urinary iodine concentration is the recommended biomarker for iodine intake, and median thresholds have been identified for classifying population iodine status. However, urinary iodine cannot be used clinically to determine the iodine status of an individual.
- Median urinary iodine concentrations of 100-199 μ g/L in nonpregnant women and 150-249 μ g/L during pregnancy

3) Iodine epidemiology

- ID impacts 1.92 billion people worldwide (3)
- until the advent of voluntary salt iodization in the 1920s, ID was endemic in many regions of the U.S.
- median U.S. urinary iodine concentrations in the National Health and Nutrition Examination Surveys (NHANES) decreased from 320 μ g/L in the 1970's to 144 μ g/L in 2009-2010
- median urinary iodine concentrations are lowest among women of childbearing age
- the median urinary iodine concentration in pregnant women from NHANES 2005-2010 was 129 μ g/L, consistent with mild ID (4)

4) Impact of Pregnancy and Breast Feeding on Iodine Needs

- Pregnant and breastfeeding women need a 50% increase in iodine intake due to:
 - a) thyroid hormone production which increases by 50% during pregnancy
 - b) increased renal loss of iodine during pregnancy
 - c) secretion of iodine into breastmilk

- d) fetal and neonatal need for iodine to produce thyroid hormone
- The RDA for iodine is 220 µg daily for pregnancy and 290 µg daily for lactation. The RDA for non-pregnant and non-breastfeeding adults is 150 µg iodine daily

5) Dietary and Supplemental Sources of Iodine

- iodine content of food sources (fish, dairy, bread) varies dramatically and is not listed on most U.S. package labels
- salt iodization is the mainstay of most global ID public health efforts, but salt iodization is not mandated in the U.S. and most commercial food processors use noniodized salt
- dairy foods are the primary source of U.S. iodine nutrition. Iodine content of milk results from iodine supplementation of cattle feed and use of iodophor cleansers
- only half of prenatal vitamin brands marketed in the US contain iodine (5)
- iodine supplementation at 150 µg daily has been determined to be safe, including in pregnancy

In summary, due to the critical nature of adequate iodine intake during pregnancy and lactation for optimal neurocognitive development, decreasing levels of median urinary iodine in the US over the last four decades, the need for increased iodine during pregnancy and lactation, and the lack of iodine in 50% of U.S. prenatal vitamins, the AACE, ATA, ES, ICCIDD respectfully request that the DGAC recommend the following for these vulnerable groups:

- Women of childbearing age, in order to achieve intakes of 150 µg iodine daily, should consume a varied diet rich in iodine-containing foods, such as fish and milk, and should choose iodized salt over non-iodized salt.
- Pregnant and breast-feeding women, in order to achieve intakes of 250 µg iodine daily, should consume a varied diet rich in iodine-containing foods, such as fish and milk, and should choose iodized salt over non-iodized salt. In addition, to ensure that increased requirements for iodine are met, our organizations have recommended that preconception, pregnant, and lactating U.S. women take a daily prenatal vitamin that contains 150 µg of iodine as potassium iodide.

We thank the DGA committee for the opportunity to share with you our perspective on the importance of adequate iodine nutrition.