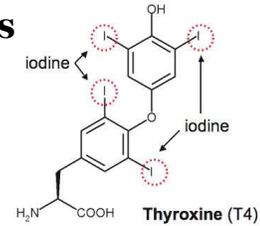


# Iodine Fact Sheet and References

## What is iodine?

- Essential trace mineral
- Only known function is synthesis of thyroid hormones
  - Function of thyroid gland is to take iodine and convert it into T<sub>3</sub> (triiodothyronine) and T<sub>4</sub> (thyroxine) hormones, which control metabolism throughout the body
- Excreted through urine



## Where do we find iodine?

- Table salt (iodized salt)
  - 1920's – introduction of iodized salt and addition of iodine to other foods to eliminate iodine deficiency
- Seafood and seaweed
- Dairy and grains
- Dietary sources of iodine in U.S. are difficult to identify, but the level of iodine in foods is not considered a significant public health problem in the U.S.

## Who's impacted?

- 2.2 billion people worldwide are at risk for Iodine Deficiency Disorders (IDDs)
  - Of these, 30-70% have goiter and 1-10% have cretinism
- Many people living in mountainous areas and some low-lying delta regions have inadequate iodine intakes because of low iodine in the soil used for farming crops.
- Due to iodination of salt, iodine deficiency in the U.S. and many Western nations has practically been eliminated. However:
  - 1970s-1990s - median U.S. urinary iodine (UI) excretion fell 50%, indicating that some subsets of population may be at an increased risk for moderate IDD.
    - Experts thought this might be attributed to a decreased salt and egg intake; removal of iodate conditioners in store-bought breads; and an increased use of noniodized salt in manufactured or premade convenience foods
  - NHANES 2001-2002 indicated that levels had stabilized
    - Even so, women of reproductive age consistently had the lowest UI levels
- Women of reproductive age are an important population subgroup to monitor
  - The initiation of iodine supplementation during pregnancy may be delayed due to woman being unaware of pregnancy during early weeks of gestation.

- Pregnant women are vulnerable to iodine deficiency due to an increased renal clearance of iodine and transfer of iodine to fetus.
- Breastfeeding women are also at risk for iodine deficiency due to loss of iodine in milk.

### What are some risks of iodine deficiency?

- Worldwide, iodine deficiency is one of the most frequent causes of preventable mental retardation in children
- Severe iodine deficiency – can cause cretinism and adversely affect cognitive development in children.
  - Wide spectrum of IDD in infants:
    - Includes mental retardation, speech and hearing deficits, motor skill impairments, and ADHD
  - In children, the severity of IDD depends on the developmental stage it occurred in and its severity
    - The earlier the deficiency occurs and the greater the severity, the more devastating the neurological damage – first half of pregnancy is *especially* critical

### What are some facts about iodine supplements?

- 49% of the different prenatal multivitamin brands marketed in the U.S. contain no iodine
- Potassium iodide contains 76% iodide
  - Most consistent form of supplemental iodine
- Iodine content of kelp varies
  - Some studies have found that actual levels are not always consistent with labeling

### What are some risks of too much iodine supplementation?

- Iodine intakes have a wide safety margin
- Tolerable ULs:
  - Adults: UL=1100 µg/day
  - Young children: UL=200-300 µg/day

### What are some WIC foods that contain iodine?

- Canned tuna and pink salmon
- Milk, eggs, cheese (iodine levels vary depending on brand)
- Whole wheat bread (iodine levels vary depending on brand)

## References

- Berbel, P., Mestre, J.L., Santamria, A., Palazon, I., Franco, A., Graells, M., Gonzalez-Torga, A., & Morreale de Escobar, G. (2009). Delayed Neurobehavioral Development in Children Born to Pregnant Women with Mild Hypothyroxinemia During the First Month of Gestation: The Importance of Early Iodine Supplementation. *Thyroid*, 19(5). doi: 10.1089=thy.2008.0341
- Berbel, P., Obregon, M.J., Bernal, J., Escobar del Rey, E., & Morreale de Escobar, G. (2007). Iodine Supplementation During Pregnancy: A Public Health Challenge. *Trends in Endocrinology and Metabolism*, 18(9). Retrieved from [www.sciencedirect.com](http://www.sciencedirect.com).
- Caldwell, K., Miller, G.A., Wang, R.Y., Jain, R.B., & Jones, R.L. (2008). Iodine Status of the U.S. Population, National Health and Nutrition Examination Survey 2003-2004. *Thyroid*, 18(11). Doi: 10.1089=thy.2008.0161.
- Columbia University. (Sept. 13, 2002). *Go Ask Alice!: What's up with iodized salt - Is it better for you than regular salt?*. Retrieved from <http://www.goaskalice.columbia.edu/2234.html>.
- Higdon, J. (2003, April). Linus Pauling Institute: Micronutrient Information Center: Iodine. Retrieved lkk <http://lpi.oregonstate.edu/infocenter/minerals/iodine/>.
- International Council for the Control of Iodine Deficiency Disorders (2010). *ICCIDD: We can prevent mental retardation from iodine deficiency*. Retrieved from <http://www.iccidd.org/index.php>.
- Lee, S.L., Ananthakrishnan, S., & Pearce, E. (2009). *Iodine Deficiency*. Retrieved from <http://emedicine.medscape.com/article/122714-overview>.
- Leung, A.M., Pearce, E.N., & Braverman, L.E. (2009). Iodine Content of Prenatal Multivitamins in the United States. *New England Journal of Medicine*, 360(9). Retrieved from [www.nejm.org](http://www.nejm.org).
- Mahan, L.K., & Escott-Stump, S. (2008). The Nutrients and Their Metabolism. *Krauses's Food & Nutrition Therapy* (39-143) (12<sup>th</sup> ed.). St. Louis, Missouri: Saunders, Elsevier.
- Pearce, E.N. (2009). What Do We Know About Iodine Supplementation in Pregnancy?. *The Journal of Clinical Endocrinology and Metabolism*, 94(9), 3188-3190. Retrieved from [jcem.endojournals.org](http://jcem.endojournals.org).
- Zimmerman, M.B. (2009). Iodine deficiency in pregnancy and the effects of maternal iodine supplementation on the offspring: a review. *American Journal of Clinical Nutrition*, 89, 668S-672S. Retrieved from [www.ajcn.org](http://www.ajcn.org).