

# Iodized salt in China provides 2/3rds of dietary iodine and ensures iodine nutrition in the population

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China was formerly severely affected by iodine deficiency, with 720 million people at risk. In the early 1970s, surveys identified 35 million individuals with IDD manifesting as goiter, and an additional 250,000 with typical cretinism. A meta-analysis of 36 studies from the affected locations showed a mean deficit in intelligence quotient of 11 points. China introduced a USI policy in 1995 with all edible salt (including table, food, and animal salt) iodized according to a national standard, most recently 35 mg/kg. This proved very effective; a national survey in 2002 found the virtual elimination of IDD. In 2010, household coverage of adequately iodized salt exceeded 95% and was <80% in only 33 of China's 2831 counties, most of them in western provinces with large salt lakes. However, coverage <90% prevails in 55 counties, including 23 in coastal areas.

In recent years, changes in the reported spectrum and incidence of thyroid diseases have been linked to the increased iodine intake resulting from USI. One recognized consequence of introducing USI is a transient increase in iodine-induced hyperthyroidism (IIH). More recent research in China's Liaoning province inferred that high iodine intake may drive thyroid function from a state of potential autoimmune impairment to overt hypothyroidism



*Millions of Chinese children learn better at school because of iodized salt*

and that iodine intake should be reduced. Danish scholars also demonstrated that iodine intake either below or above the recommended levels is associated with an increased population risk of thyroid disease. All researchers recommend careful monitoring of population iodine status.

In China, iodized salt is the main vehicle for iodine supplementation. Salt production is tightly controlled and the sale of non-

iodized salt is restricted. However, China was described by WHO as "at risk of IIH in susceptible groups" based on median UIE of 246 µg/L among children in 2005 and more recent assessments found higher levels of UIE in some surveyed areas. In addition, concerns about the thyroid health of populations in coastal provinces in the context of USI have circulated in the local media and international medical literature.

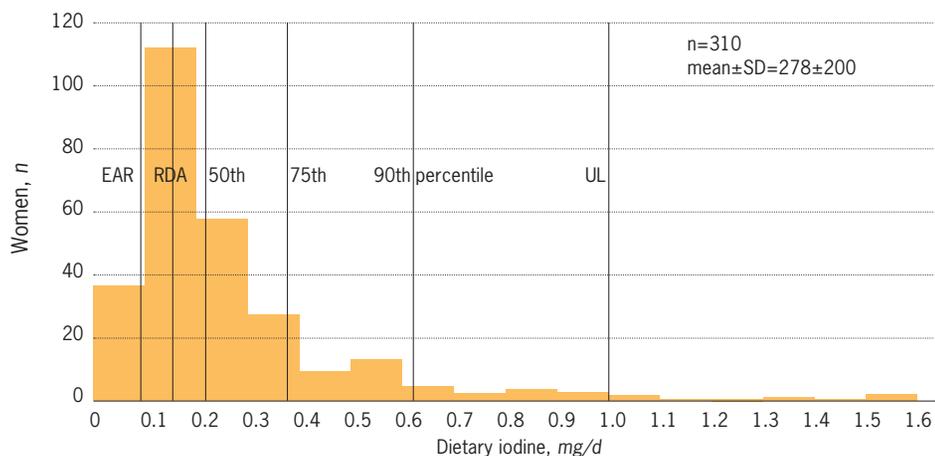
Some coastal cities have been unofficially allowing the sale of uniodized salt that formerly required a prescription and there were calls for liberalizing provincial control of such sales. Threats to USI in China raise the specter of recrudescence of IDD in a nation admired for its “world’s best achievements” in this area and might influence USI in many nations at risk of IDD. On the other hand, excess iodine consumption may also have adverse public health impacts. Given these threats, and in the absence of national, population-representative, and age-disaggregated data on UIE, China’s dietary iodine intake is thus highly relevant to policy on USI. Therefore, the aim of this paper is to report dietary iodine intake and the contribution from iodized salt among Chinese residents, including by age and sex among coastal populations, after more than a decade of USI.

The calculated iodine intake of a standard male in China averaged 425 µg/d in 2007 and 325 mg/d in coastal areas in 2009, well below the upper limit (UL) in all provinces. In 2009, iodine intake was above the UL in only 1–7% of age-sex groups, except among children (18–19%).

Importantly, a significant number of individuals consumed less than the WHO-recommended daily intake, including 31.5% of adult women (Figure 1). Salt contributed 63.5% of food iodine, and 24.6% of salt iodine was lost in cooking. Overall salt consumption declined between the surveys in 2007 and 2009.

The authors concluded that salt iodization assures iodine nutrition in China, where environmental iodine is widely lacking. The risk of iodine excess is low, but plan-

**Figure 1: Dietary iodine intakes by women aged 18–50 y in 4 coastal provinces in China in 2009 by percentile and relative to 3 intake standards.**



To document iodine intake and the contribution from iodized salt in China, the authors surveyed dietary iodine intake during China’s nationally representative 2007 total diet study (TDS) and during an additional TDS in 4 coastal provinces and Beijing in 2009. Iodine intake was broken down by age and sex in 2009. Mean daily iodine and salt intake and the contribution from different food and beverage groups (and in 2009, individual items) were measured. The iodine in food cooked with iodized and noniodized salt was also assessed.

ned decreases in salt iodization levels may increase the existing risk of inadequate intake. Regular monitoring of urinary iodine and more research on the impact of excess iodine intake is recommended.