

Consumer Reports Protocol: Heavy Metals in Children’s Food
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The objectives of this study were: 1) to determine the levels of total arsenic, inorganic arsenic, cadmium, lead, and mercury in various foods intended for infants and toddlers; and 2) to assess any associated health risk. We tested 150 samples (3 unique samples each of 50 models), which included: 1) cereals (rice and oatmeal); 2) snacks (bars, biscuit, cookie, cracker, crunches, puffs, rice rusks, and wafers); 3) fruits and vegetables; and 4) meals/entrees. The models tested were selected based on marketing data and data from a shopper survey of stores in New York and New Jersey. Samples were purchased between June and August of 2017 from the New York and New Jersey area, from other regions in the U.S., as well as online. We made efforts to include nationally available models, and tried to get unique samples or lots of each model from different geographical regions of the U.S.

To be clear, Consumer Reports conducts its testing to provide consumers with advice to inform their decision-making. We do not perform compliance or regulatory testing, and our results are not meant to be viewed as such.

Sample Preparation

Unopened samples were masked, blind coded to preserve their identities, and shipped overnight to an independent, accredited laboratory. At the lab, sample preparation was performed in fume hoods verified to be free from trace metals contamination. Water, sample containers, and other materials used for the analyses were monitored for contamination to account for any biases in sample results.

Testing

All samples were prepared and analyzed in accordance with the most up-to-date industry standards and test methodologies. The testing conformed to the quality control criteria and performance requirements set in the Association of Official Analytical Chemists (AOAC) Method 2015.01 as well as to those in ISO 17025.

Risk Assessment

We estimated the daily consumption of the foods using the dietary intake measurements from the Centers for Diseases Control and Prevention (CDC), and determined the associated doses of the heavy metals from those estimates, our test results, and the average body weights of children 4 months to 2 years old.

To estimate the potential cancer risk from exposures to inorganic arsenic, we used the following equation: *Excess Cancer Risk = Lifetime Average Daily Dose (LADD) x Cancer Slope Factor*. We applied a cancer slope or potency factor (CSF) of inorganic arsenic that was derived by the Environmental Protection Agency (EPA IRIS 2010) for the combined incidence of bladder and lung cancer. Thereafter, we set our Tolerable Risk Level at no more than 1 excess cancer case in 10,000 people.

To assess the potential risks of non-cancer health effects from estimated exposures/doses of inorganic arsenic, cadmium, lead, and methyl mercury, we compared our exposure estimates to the health-based limits listed in Table 1 below.

Table 1. Selected Health-Based Exposure Limits

Heavy Metal	Source	Value (Unit)
Inorganic Arsenic	EPA (1991)	0.1-0.3 µg/kg bw/day
Cadmium	EFSA (2009)	0.36 µg/kg bw/day
Lead	OEHHA (2017); FDA (1993, CR-Modified)	0.5-2.0 µg/day
Methyl Mercury	EPA (2001)	0.1 µg/kg bw/day