

COMMITTEE ON TOXICITY OF CHEMICALS IN FOOD, CONSUMER PRODUCTS AND THE ENVIRONMENT

COT statement on the potential risks from lead in the diet of infants and young children: lay summary

1. The Committee on Toxicity (COT) were asked by the Scientific Advisory Committee on Nutrition (SACN) to review the risks of toxicity from chemicals in the diet of infants (aged 0-12 months) and young children (aged 1-5 years). The COT issued a statement in 2013 on the potential risks from lead in the infant diet [<http://cot.food.gov.uk/pdfs/cotstatlead.pdf>]. In 2016, the COT issued an addendum to its 2013 statement, which extended the assessment to young children and updated the assessment for infants, based on the most recent data on exposure [<https://admin.food.gov.uk/sites/default/files/finaladdendumonlead.pdf>]. This lay summary has been updated to provide an overview of the information in the two COT documents.
2. People are exposed to lead through food, drinking water, air, soil and dust. Food and water are the major sources of exposure to lead, although in infants and young children, ingestion of soil and dust can also contribute importantly. In addition, lead can be transferred to the infant from the mother in breast milk. Exposure to lead in the UK has decreased substantially over recent decades.
3. The proportion of ingested lead which is absorbed into the body is higher in children than in adults. Inadequate intakes of calcium, iron and zinc have been shown to increase lead absorption, and higher levels of fat in the diet may lead to higher blood levels of lead.
4. Absorbed lead is transported in the blood, and then deposited in soft tissues and bone, where it tends to accumulate with age. During pregnancy and breastfeeding, calcium in the mother's bones is released to meet the needs of her baby, and this results also in the release of lead from the bone.
5. Concerns about adverse effects from lead in the diet and environment relate principally to long-term cumulative exposures. The kidney and cardiovascular systems can be adversely affected by lead exposure in adults. However, epidemiological studies have demonstrated effects on the brain at lower levels of exposure, and the developing brain is more vulnerable than the mature brain. In particular, there is strong evidence that lead can impair intelligence (as measured by IQ). It has not been possible to demonstrate a threshold level of exposure below which adverse effects on the infant brain are absent.
6. The Committee concluded that assessment of the potential risks from exposure of infants and young children to lead should be made by reference to an

exposure value of 0.5 micrograms per kilogram body weight per day, which the European Food Safety Authority (EFSA) had estimated would produce less than a 1 point decrement in IQ. Exposure below this value indicates that the health risk is small.

7. The Committee calculated estimates of exposure of UK infants and young children to lead from different sources and compared them to the exposure value identified by EFSA. For infants aged 0 to 6 months old who are fed breast milk, ready to feed drinks and powder formula made with water containing typical lead concentrations, any risk would be small. A small risk cannot be ruled out for infants of this age exclusively fed on infant formula prepared with water containing lead at the upper end of the concentration range of lead in public water supplies. It was not possible to estimate likely exposure in those relying on private water supply.

8. For older infants, and for young children, any risk from diet alone will also be small. However, the effects of lead will depend on total exposure to lead from all sources so it is important to consider combined exposures from food, water, and also non-dietary sources. When the possible contribution from soil and dust is taken into account, a risk at the population level and to some infants and young children cannot be ruled out. Exposures from air are negligible.

9. There are a number of uncertainties in the assessment of risks to from lead exposure and generally conservative assumptions have been made in estimating risk. The COT previously noted the decreasing trends in dietary exposure to lead and blood lead levels in recent decades. Nevertheless, the absence of an identified threshold for neurodevelopmental effects of lead and the exposures identified in this assessment emphasise the need for continued efforts to control lead in the environment

The 2013 COT statement can be found at: <http://cot.food.gov.uk/pdfs/cotstatlead.pdf>

The 2016 addendum can be found at:

<https://admin.food.gov.uk/sites/default/files/finaladdendumonlead.pdf>

Lay Summary to COT Statement 2013/02 and COT addendum 2016/03

August 2016