131I, 134Cs, and 137Cs in Austrian Milk

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Austria was among those countries having the highest depositions of radioactive materials following the Chernobyl disaster on April 26, 1986. Doses from ingestion arise mainly from 131I, 134Cs, and 137Cs. Although the hazards from consumption of contaminated food such as milk are almost certainly exceedingly small for adults, there may be some risk involved for the fetus and the rapidly growing infant. Therefore, we carefully monitored 131I, 134Cs, and 137Cs—the radioisotopes of greatest concern—in milk from April 28 to August 31, 1986.

One hundred eighty-eight samples of cow's milk, which were sold in supermarkets in the Vienna area, and 118 samples of pooled breast milk from

![Graph showing 131I in breast milk and cow's milk over time.](image)

FIG. 1. 131I in breast milk (○) and in cow's milk (+).
\[ 131I, 134Cs, \text{ AND } 137Cs \] IN AUSTRIAN MILK

the Department of Pediatrics were analyzed by a Na-I-scintillation detector. Detection limits for \(131I\), \(137Cs\), and \(134Cs\) were 5, 3, and 3 Bq, respectively.

Concentrations of \(131I\) in cow’s milk (Fig. 1) were greatest during the days after the event, and an exponential decrease occurred during subsequent weeks. This is related to the short half-life of this isotope. Only during the first 2 weeks was \(131I\) also elevated in pooled breast milk. Its concentration in pooled breast milk was only about one-tenth that in cow’s milk, which confirms observations made after the detonation of a nuclear device in 1959 in the United States.

Cesium concentrations in cow’s milk (Fig. 2) increased during the first week after the event and were highest during the first week of June. Four months after the event, concentrations were still in the range of 40 Bq, and a further increase during the winter months is expected when the cows are fed silage or hay that had been contaminated during May. Cesium in pooled breast milk with few exceptions was below 40 Bq.

Based on these observations and reports from other Austrian laboratories, our physicians recommended that pregnant women and breast-feeding mothers should reduce their milk intake in May and June. Mothers were advised to continue breast-feeding as long as possible. Infant formula manufacturers imported milk powder from areas that were not contaminated in order to avoid unnecessary Cs intake with infant formula.