STUDIES ON RISK ASSESSMENT FOR DIOXINS IN BREAST MILK AND BABY FOOD

Yasuto Matsui and Iwao Uchiyama

Department of Urban and Environmental Engineering Graduate School of Engineering, Kyoto Univ., Sakyoku, Kyoto, Japan

We used a one-compartment model to predict the body burden of dioxin and dioxin related compounds (dioxins) all through life on human. We have investigated intake of dioxins in childhood in Japan. We recognized eight stages of growth: 5-6 months, 7-8 months, 9-11 months, 12-15 months, 1 year, 2 years, 3 years, and 4-6 years. First, we carried out a questionnaire survey to typical menu of each stage which consisted of commercial baby food and powdered milk etc.. Then we determined the amount of dioxins in its menu by total diet study. The values of dioxins in food taken after 7 years and breast milk taken before 5 months were available in the report of Ministry of Health, Labour and Welfare in Japan. We estimated body burden on the basis of the results of the survey and prevailing data of body weight and intake of food.

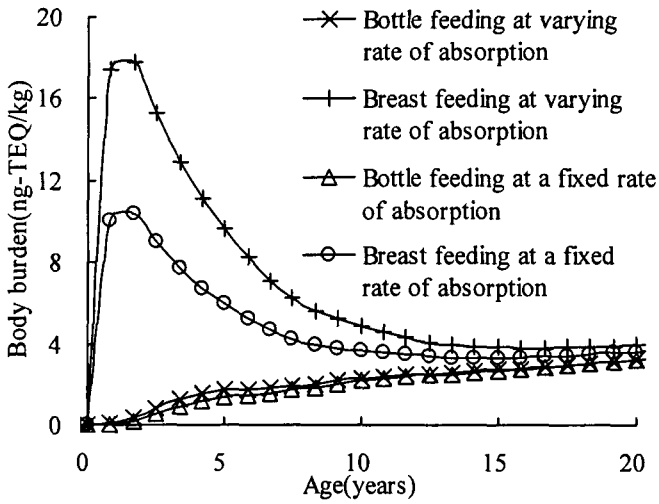

Fig. 1; Simulation of body burden of dioxins during the first 20 years and comparison of bottle feeding with breast feeding. Fixed rate is 50% absorption (○, □), and the others (+, ×) are varying by ages.

The graph in Fig.1 illustrated that body burden become less than 4.0 ng-TEQ/kg by the time mid to late teens regardless of absorption rate, whereas breast feeding is 4.3 times bottle feeding at 5 years at fixed rate of absorption. In the case of varying absorption rate according to age is about 18 ng-TEQ/kg at 2 years. Admittedly body burden become much the same between bottle feeding and breast feeding over a lifetime, although health effects of dioxins are uncertain on the early period growing at fast rate.