

Dioxins, Dibenzofurans, and PCB's in Meat Containing Baby Food

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Introduction.

Baby foods were previously tested for pesticides but not for the dioxin-like compounds. Meats sold for general consumption have been tested for dioxins, but not meat containing baby foods. We determined the concentrations of dioxin-like compounds in widely sold meat containing baby foods and calculated their concentrations of dioxin toxic equivalents (TEQs).

Methods

There are three major brands of baby food in the United States. Professional shoppers employed by Consumers Union bought jars of commercial meat baby foods in several cities in different regions of the United States, according to a balanced sampling design (matrix of meat-type vs brand). Types of meat included chicken, turkey, beef, lamb, and ham. Not all types of meat were available in all three brands. Twelve different brand/types were available. A total of 24 jars of each brand/meat type was purchased, four-to-six in each city and each jar from a different product lot. Only one brand is sold nationally; two are regional.

The contents of all jars of the same brand and meat type were composited. The full description of the extraction method appears in ref. 1 and analytical procedures, ref. 2. The 2,3,7,8 PCDDs and PCDFs and co-planar PCBs were measured. Results, reported in TEQs (toxic equivalencies compared to 2,3,7,8 TCDD), were calculated with the EPA and WHO values (3).

Results

The total TEQs calculated for all the brand/models fell within a rather narrow range of about 30 pg/kg of food to about 200 pg/kg (Table 1). Because only one composited sample of each of the twelve brand/types was analyzed, concentration differences would have to be large to be statistically significant. We did not find statistical differences. We did find that the lipid content was statistically associated with the pgs TEQ/kg baby food.

Table 2 displays the concentrations of TEQs found in meat sold in supermarkets and butcher shops in the United States in 1995 (4). These concentrations ranged from 74 to 636 pg TEQ/kg of meat (wet weight).

Discussion

The concentrations of TEQs found in meat-containing baby foods are generally lower than those found in meats sold in groceries and butcher shops. Meat-containing baby foods must be pureed and thus contain some water as well as other ingredients.

Most babies under a year do not eat meat regularly. The USDA 1995 Food Intake Survey reported that only 34% of the infants under a year ate meat the day before the telephone interview (an average intake of 28 grams among those who did indulge) (5). In the much larger Gerber 1995 survey (6), less than five percent of the babies ate any meat before age five months. Beyond that age, the percent of meat-eaters increased rapidly to about 40% at 9 months and about 70% at 12 months. The great majority of these meat-eaters consumed table meats, not meat baby foods. Only about 20% of the babies ate meat baby foods between ages 7 and 12 months with a peak consumption of 24 grams at 8 months.

Although only about 30% of babies by nine months of age eat meat, by one year of age, over 70% eat table meat, an average of 35 grams per day (Gerber 1995 Survey). By weight, meat never accounts for more than 5% of the diet of a baby under one year of age.

With all three brands of chicken as the only consistent exception, most of the TEQs in the meat baby foods were from the co-planar PCBs. PCBs have not been manufactured since the 1970's. PCDDs and PCDFs are being continually created during manufacture of certain chlorinated synthetics, manufacture of bleached pulp and paper, and burning of chlorinated plastics and solvents in hospital, municipal, solid waste, and hazardous waste incinerators (7). PCDDs and PCDFs are also generated in other combustion processes such as accidental fires.

The health consequences of dioxins in meat containing baby foods are unknown.

References

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Table 1. TEQs (pg/kg) in Baby Food Meats

	TEQs, PCDD/PCDF	TEQs, co-planar PCBs	Total	% fat (wet-wt. basis)
Chicken				
Brand A	64.7	69.8	134.5	6.2
Brand B	42.6	27.1	69.7	1.7
Brand C	131.1	70.4	201.5	8.7
Turkey				
Brand A	30.1	66.9	97	4.8
Brand B	49.8	51.9	101.7	5.6
Brand C	37.6	75.2	112.8	5.6
Beef				
Brand A	12.2	65.5	77.7	5.5
Brand B	46.9	95.3	142.2	6.3
Brand C	12.7	66.7	79.4	5.5
Lamb				
Brand A	10.7	17.4	28.1	3.4
Brand B	7.8	21.6	29.4	2.9
Ham				
Brand A	16	21.1	37.1	2.8

Table 2. TEQs (pg/kg) in Meat from Stores

meat	TEQs, PCDDs/Fs		TEQs, PCBs		total	
	low	high	low	high	low	high
beef	127	398	64	238	191	636
pork	74	405	0	221	74	626
poultry	84	224	84	224	168	448

Taken from ref. 4