Lead Content of Pet Foods

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Animals fed lead in test diets accumulate this element in their organs, as shown by the feeding of waste paper containing lead to beef cattle (DINIUS and OLTJEN, 1971). Lead was not detected in edible muscle tissue but measurable quantities were found in liver and kidney. These organ meats are the main ingredients of some pet foods. Since increasing evidence suggests that subtoxic levels of dietary lead might be detrimental to animals (e.g. KOLLER, 1973), we examined canned dog and cat food for their lead content.

Methods

Pet foods were purchased at local food markets. Analysis for lead was made with a Perkin Elmer Model 303 Atomic Absorption Spectrophotometer. Samples were prepared as detailed by DALTON and MALANOSKI (1969).

Results and Discussion

The concentration of lead found in dog and cat food ranged from 0.9 to 7.0 ppm (Table 1). It was expected that products with liver and kidney would have been among the highest in lead content, but this was not always observed. However, we had no way of determining the percentage composition of each component in the product.

Calculation of the daily ingestion of the products reveals their possible toxicity to an animal (Table 1). For the cat the amount of food consumed per day was estimated at 6 ounces (170 g) and for the dog, 15 ounces (425 g). Thus the daily consumption of lead for a cat would range from 0.15 to 1.2 mg per day and for the dog 0.43 to 2.4 mg per day.

Although the dietary level of lead that causes biochemical changes but not overt toxicity for a cat or dog is not clear, more than 0.3 mg per day is considered hazardous for a child (KING, 1971). For illustrative purposes we assume that the potentially toxic level of lead for a cat or dog is similar to that for a child. Thus, ingestion of 0.15 to 2.4 mg per day is 0.5 to 8 times the potentially toxic dose of lead suggested for children.

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TABLE 1.

Lead Content of Canned Pet Foods.

Sample No.	Major ingredients	Lead content (ppm)	mg Lead/serving[a]
Canned Cat Food			
1.	meat by-products, liver	0.9	0.15
2.	turkey, kidney	0.9	0.15
3.	fish, chicken parts, kidney liver, heart	1.4	0.24
4.	beef by-products, liver, kidney	1.6	0.27
5.	liver, chicken	2.0	0.34
6.	kidney	2.2	0.37
7.	kidney	2.2	0.37
8.	chicken, kidney	2.4	0.41
9.	tuna	3.2	0.54
10.	chicken parts, liver	3.6	0.61
11.	fish, chicken and meat by products	4.0	0.68
12.	meat by-products, liver, beef	4.4	0.75
13.	poultry by-products, chicken	7.0	1.19
Canned Dog Food			
14.	chicken, liver	1.0	0.43
15.	meat by-products, pork liver	2.0	0.85
16.	chicken, liver	2.0	0.85
17.	liver, meat by-products	2.4	1.02
18.	meat by-products, horsemeat	5.6	2.38

[a]Daily serving for the cat estimated at 170 gm (6 ounces) and for the dog, 425 gm (15 ounces).

Two dry cat foods were also tested and found to contain 3.5 ppm and 6.0 ppm lead. Based on consumption of 120 g per day, the cat would ingest 0.42 and 0.72 mg lead, or 1.4 and 2.4 times the 0.3 mg level considered unsafe for a child.

Evidence is accumulating to suggest that subtoxic levels of dietary lead are detrimental to animals. For example, regular ingestion of lead decreased antibody formation in mice (KOLLER and KOVACIC, 1974), and suppressed the immune response to pseudorabies virus in rabbits (KOLLER, 1973). Furthermore subtoxic doses of lead increased the susceptibility of rats to

bacterial endotoxins (SELYE et al., 1966), and of mice to Salmonella typhimurium (HEMPHILL et al., 1971). Clearly, the potential risk to pets ingesting low levels of lead from pet foods merits further attention. These results may also have relevance to human nutrition because of the recent report that pet foods are allegedly consumed by people (National Nutrition Policy Study, 1974).

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