

POLYCHLORINATED BIPHENYLS (PCB) IN FOODS

I. PESTICIDE PROGRAM

Since November, 1969, the Food and Drug Administration has analyzed all food commodities sampled in the Pesticide Program for polychlorinated biphenyls (PCB). More than 15,000 samples representing 59 food commodity classes of both domestic and foreign origin have been collected and analyzed during this period. As of June 30, 1971 PCB were detected in 475 of the samples examined. This includes some reported residues which would be considered below the sensitivity of the analytical methodology. Of the total 475 samples in which PCB were detected, 279 can be classed as objective (surveillance) samples (i.e., samples collected where no prior knowledge of a problem existed) and the remaining 194 can be classed as selective (compliance) samples (i.e., samples collected as a follow-up to a known problem).

The following is a summary of the findings. "Trace" in normal analyses would be less than approximately 0.1 ppm in fish; 1-15 ppm in milk or cheese fat; 0.2 ppm in eggs; 0.2 ppm in fruits and vegetables.

Commodity Class	No. of Positive Samples			PCB (ppm)		
	Total	Objective	Selective	Low	High	Average
Fish	312	195	117	Trace	35.29	2.13
Cheese	43	1	42	Trace	1.00	0.20
Fluid Whole Milk	60	39	21	Trace	13.00	2.05
Shell Eggs	18	8	10	Trace	0.50	-
Shellfish	14	13	1	Trace	0.24	-
Fish & Marine By-Products	5	5	-	0.20	5.00	2.10
Vegetable By-Products	5	3	2	0.10	1.73	0.76
Processed Vegetables & Vegetable Products	5	5	-	0.60	4.20	1.71

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Commodity Class	No. of Positive Samples			PCB (ppm)		
	Total	Objective	Selective	Low	High	Average
Miscellaneous Animal Feeds	4	2	2	0.43	6.49	2.89
Silage	3	3	-	0.15	1.12	0.70
Miscellaneous Processed Foods	2	2	-	0.20	0.70	0.45
Hay (Naturally Cured)	1	1	-	0.30	0.30	0.30
Frog Legs	1	1	-	0.90	0.90	0.90
Grains	1	1	-	0.32	0.32	0.32
Fruit by-Products	1	-	1	Trace	Trace	Trace

PCB were encountered most frequently in fish; 312 of the 475 samples in which PCB were detected were of this commodity class.

2. TOTAL DIET STUDIES

The FDA Total Diet Studies for 60 market baskets representing a total of 720 composite samples during FY '70 and FY '71 show 22 composite samples to contain PCB residues ranging from a trace to 0.36 ppm. Seventeen of these composites represented the meat, fish, and poultry composite. Other positive findings were in the dairy and the grain and cereal composites. PCB residues in two of the grain and cereal composites from the April-May, 1971 market baskets were traced to product contamination by PCB migration from the packaging material which had been fabricated from recycled paper (for additional information see below).

3. PCB IN PAPERBOARD AND PACKAGED PRODUCTS

In early 1971, a follow-up to a finding of PCB contamination of poultry disclosed that the poultry feed fed the flock apparently was contaminated by chopping and grinding stale bread, including wrappers that contained PCB.

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PCB residues at levels of approximately 27 ppm were detected in a sample of shredded wheat collected and examined as part of the April-May, 1971 market basket survey. Samples of raw materials, packaging materials, and finished products were collected during a follow-up inspection at the manufacturer. Analyses of samples of raw materials (shredded wheat from the production line and cleaned wheat and cuttings from bag) revealed no PCB contamination. PCB residues were detected in samples of bleached manila lined chipboard and boxes used for packaging shredded wheat at levels of 5.3 ppm and 17.6 ppm respectively. Examination of a sample of the finished product packaged on the day of the inspection disclosed that PCB, if present, were less than confirmation levels. Analyses of five samples from previous production lots showed PCB contamination of the shredded wheat in all five samples ranging from 0.3 to 1.9 ppm. Follow-up inspections of the plants fabricating the packaging materials showed that recycled paper was being used to make the boxes and dividers.

In August 1971, Cincinnati District analyzed samples of various packaging materials. PCB residues ranged from 1.9 to 433 ppm. The highest level was detected in a box intended to be used in packaging softlines.

4. PCB CONTAMINATION DUE TO LEAKAGE OF HEAT EXCHANGE FLUID

Heat exchange fluids containing PCB are used in certain pasteurization equipment. Problems to date have involved direct PCB contamination of animal by-products intended for animal feed purposes.

Leakage of the heat exchanger fluid from equipment at the East Coast Terminal, Wilmington, N. C. caused the PCB contamination of fish meal which was then used as a component of animal feed. Analyses of 166 samples of shell eggs from chickens fed the contaminated feed showed 117 samples with PCB levels ranging from a trace to 4.2 ppm. PCB residues in 55 samples were above 0.5 ppm. Fourteen of 29 samples of catfish fed PCB contaminated fish meal were found to contain PCB residues ranging from a trace to 3.1 ppm.

Since the incident at East Coast Terminal, suspected leakage of PCB from equipment has allegedly caused contamination of animal by-products and animal feeds at three other plants. Investigations at these other plants are continuing.

5. PCB IN PAINT AND SEALANT

In 1970 dairy silos treated with paint and sealant containing PCB resulted in extensive contamination of dairy herds and raw milk in Ohio and Kentucky. Reportedly, paint and sealant with PCB has since been removed from the market.

6. PCB IN HERBICIDE SPRAY

In 1969 PCB ranging as high as 13.0 ppm were detected in samples of milk in West Virginia. Follow-up investigation disclosed that discarded transformer fluid containing PCB was being used as a solvent for spraying herbicides on power company right-of-ways. This resulted in PCB contamination of grazing areas and subsequent contamination of milk.

7. PCB IN POTATO PRODUCTS AND BY-PRODUCTS

Seattle District has encountered PCB contamination in potato products and potato by-products for animal feed. Investigation has been unable to trace the source of the contamination. Based on available information it appears that PCB contamination occurs sporadically during the processing of potatoes. PCB contamination has been detected more frequently in by-products for animal feed than in in-process or finished potato products.

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