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These later Japanese investigations linked the disease to the PCDF content of the rice oil. This conclusion is consistent with PCDF activity in animal tests and with the observation that body burdens of electrical-grade PCB's (from inhalation and skin contact) larger than the PCB doses ingested by Yusho victims have not induced Yusho illness in capacitor workers.

The Japanese Yusho investigators also reported that the minimum dose for induction of the disease was about 0.5 gm of the thermally decomposed heat exchange fluid (the PCB-PCQ-PCDF mixture) (51). Using a range of reported PCDF analyses (52), the PCDF toxicity threshold dose might therefore be estimated at 1.0 - 1.5 mg.* A similar threshold dose (1.26 mg) has been estimated from data on the amount of PCDF consumed by patients before the onset of the symptoms in the recent episode in Taiwan (60).

3. Effects of Eating Fish Containing PCB's The Michigan Department of Public Health, under the sponsorship of FDA, conducted a study of 182 adults, 105 of whom consumed over 26 pounds of Great Lakes fish per year. A significant correlation between blood PCB levels and quantity of fish eaten was observed. The mean blood PCB value for the exposed group was 73 ppb, while that of the comparison group was 20 ppb. Individual blood PCB levels ranged from 7 ppb for a person who ate no fish to 366 ppb for one who ate 132 pounds per year (11,12).

Evaluation of health histories and current medical problems of the study subjects failed to identify a significant difference between the exposed and comparison groups. Symptoms characteristic of reported PCB toxicity (Yusho symptoms) were not found nor did those with the highest PCB levels have a consistent pattern of complaints or conditions. Although the data demonstrate an association between fish consumption and PCB levels in humans, no toxic manifestations from this exposure have been identified to date (12). The question of PCB accumulation over time and the effects of long-term exposure are being evaluated in a continuation of this study.

A recent study (61) of 458 persons who had significant exposure to DDT from eating fish also reported PCB blood levels (arithmetic mean, 22 µg/L; range 3.2 to 158 µg/L). The authors report that the following significant correlates of log diastolic blood pressure might account for 24.1% of its variation in this cohort: body mass index, 6.8%; sex, 8.3%; log PCB level, 6.3%; age, 1.5%; Hollingshead index, 1.1%.

4. Clinical Studies of Capacitor Workers The most extensive long-term exposure of humans to PCB's has probably occurred in capacitor plants around the world. (There were 17 capacitor plants using PCB's in

A recent reanalysis of YUSHO patient data puts this figure at 0.6 mg. (26 p. 291)

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