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Mercury in the California Environment

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Mercury seems to be rapidly replacing DDT as the center of attraction for environmentalists. When someone finally thought about examining some dead Bald Eagles from the Midwest, government laboratories found levels over 100 ppm of mercury in organs of half of the dead birds. Sweden reported Peregrine falcons with high mercury levels doing strange things to their own eggs.

The National Wildlife Federation recently told of mercury contamination in game birds in Montana, and there have been reports of low levels of mercury in California pheasants.

Fishing was banned or warnings of mercury residues in fish were issued in 20 states, including California, according to the Federation. Recent releases from state and federal water quality agencies suggest more concern for sewage and phosphate contamination than for mercury residues.

The problems of mercury in California are under study by a Governor's task force of experts, under the direction of Dr. Ephrian Kahn of the State Health Department. In early August, Dr. Kahn reported the evidence of fish contamination was inconclusive.

FISH RESIDUES

An interesting survey of fish in Northern California, including the San Francisco Bay Delta and some ocean fish, was released in late July. Ninety-seven samples of fish were analyzed, and all had detectable mercury residues in the edible flesh. Five of the 97 exceeded the level of 1 ppm, which is the level Sweden had used to restrict fishing. The U. S. Federal action level

of 0.5 ppm would include 19 of the 97 samples, yet not even a temporary ban of fish eating in California has been ordered.

Many of the fresh-water fish samples are from areas where the mercury residues are natural, and people have been eating these fish for years.

Sea water usually contains about 0.03 ppb and ocean plankton about 0.03 ppm of mercury. The plants apparently can concentrate the natural sea water level 1000 times. This shows that mercury residues in ocean fish are also apparently natural.

If the World Health Organization suggested tolerance level of 0.05 ppm of mercury is used as a proper safety standard, 83 of 87 fresh-water fish samples, and all 10 ocean fish samples would be declared unfit for human consumption. The 0.05 ppm tolerance is the same amount allowed for DDT in cow's milk from chance contamination. DDT is so much safer than mercury that there is actually no comparison in hazards.

Mercury lost during gold mining operations such as practiced on the Feather and Yuba Rivers has been estimated at 40 to 80 million pounds. This exceeds any other type of mercury loss in the state. The available evidence for California points to natural mercury as a much more important pollution source than industrial mining or any other use of mercury. Northern California has many deposits of red cinnabar, which is an oxide of mercury, and fish from these areas show high residues. Many areas with high residues in fish have no history of mercury use.

MERCURY HAZARDS

Use of mercury for seed treatment was curtailed because it was thought that this use was causing residues in California pheasants, yet the risks from natural mercury residues seem much more important.

Small amounts of mercury can also be picked up from the soil and moved through the plant to the seeds of grain. It is obvious that these small amounts can be derived from treated seed or from natural soil deposits of mercury.

In Minamata, Japan, there were 22 cases of poisoning of unborn infants, where the poison was passed from the mother to the embryo. In other experiments, mercury has been shown to cause changes similar to gene mutation. Mercury causes irreversible brain and nervous system damage if the concentration exceeds a critical level in animals.

The Federal Food and Drug Administration has established that fish with 0.5 ppm residue levels should not be eaten more often than once a week.

LEAD

Lead may well follow mercury in receiving a critical examination. For example, it may prove to be the real cause for the thin pelican eggs on the islands off Southern California. The anchovies in this area show an average of 7 ppm of lead residue.

In a recent analysis, fish from Clear Lake showed three times as much lead as DDT-like residues. Neither the lead nor the DDT was high enough for concern. Salmon from the hatchery at Redding are reported to have 7 ppm of lead.

Lead poisoning in ducks is common. The ducks pick up the lead shotgun pellets while feeding.

A DILEMMA

Residues on foods can be caused by natural contamination as well as purposeful treatment. From a public safety viewpoint, the source of a residue really makes no difference. If mercury from some small agricultural use is restricted under the banner of human health protection, then natural residues should get equal treatment to protect the public. It is popular today to blame somebody for residues, but when they are natural, there seems to be hesitation to protect the public health with equal vigor. Condemning nature is unpopular.

Pesticide residue safety factors usually must exceed a safe level by 100 to 1000 times before a tolerance in food will be granted. With natural mercury, safety factors as small as 10 are proposed as adequate to protect the public health. Since 1955, the Food & Drug Administration has had a tolerance of zero for mercury-containing compounds in food.

If the same rules of human safety were applied to natural mercury as are applied to much safer synthetic chemicals, there would be no fish to eat. It has been said that no level of a carcinogen in food should be considered safe, yet the hazards of natural mercury are apparent.

The whole concept of pesticide safety and hazards of food additives, whether natural or not, should be calmly re-evaluated. Cyclamates offer weight watchers a chance to enjoy their food, yet the government ordered cyclamate sweetened foods destroyed. Cyclamates are *supposed* to cause cancer in rats at high doses; mercury effects on people are proven and deadly. Dr. Phillip Handler, president of the National Academy of Science is credited with saying that the cyclamate cancer tests were the worst designed study he had ever seen.

A person eating cyclamate sweetened food is no different than a person

eating fish with mercury in it. We can control both, yet cyclamate-sweetened diet foods are ordered destroyed, and fish with apparent equal or higher risk of harm are overlooked. Equal concern for human safety would seem to dictate either availability of cyclamate diet foods or restriction of fish eating.