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PCB, PBB rules mean millions to Michigan

This is the third in a four-part series on how science stubbed its toe on two related groups of chemical pollutants known as PCB's and PBB's and now is trying feverishly to find out whether the ominous risks are real.

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The U.S. Food and Drug Administration (FDA) is not reviewing its standard of safety for PCB contamination of fish and other foods even though it may have been set too high because of a misreading of a Japanese poisoning incident, The Detroit News has learned.

PCB — the industrial pollutant threatening Great Lakes game fish — in turn became the basis on which the FDA set tough standards for PBB, a family of sister chemicals which has poisoned tens of thousands of Michigan cattle.

New evidence from the Japanese incident indicates that a contaminant of the PCB was responsible for some of the poisonous effects which killed five people and caused mild to serious illness among another 1,000.

This suggests that the American standard is too high if only PCB's are considered.

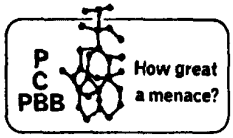
But on a completely separate issue, there is a growing body of scientific opinion that the poisonous effects of PCB and PBB may be additive — one building on the impact of the other — which could become evidence favoring a tightening of the standards.

Dr. Gary Flamm, the National Cancer Institute's assistant director of cancer cause and prevention, said:

"We've got to look at PBB and PCB together. The situation we're saddled with is that the Michigan population is the most exposed to both."

The push me-pull me situation on PCB and PBB standards does not necessarily mean the standards are too high or too low. The government has done too little research to know.

What it does mean, according to scientists outside the FDA, is that the Food and



Drug's rationale behind the standards is eroding.

"Still, there's always a need to set standards," said Dr. Clark Heath of the federal Center for Disease Control. "But what you end up with is a best informed guess."

The quality of that guess is of vital importance to Michigan because the standards affect the state's multimillion dollar sport fishing industry, as well as a share of its farm income.

The FDA's current interim standards allow up to 5 parts per million PCB and three-tenths of 1 part per million PBB in foods. The agency's guideline for building

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Standards critical for Michigan

Millions at stake in PCB, PBB rules

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PCB is the short name for a family of chemicals called polychlorinated biphenyl, manufactured in the U.S. by Monsanto Chemical Co. and used in electrical transformers and scores of other products.

PCB's have contaminated all the lake trout and coho salmon tested by the U.S. Fish and Wildlife Service in Lake Michigan and are threatening the $178-million, federal-state Great Lakes fish restocking program, according to the Department of Interior.

Moreover, a not-yet-released survey of Lake Michigan trout recently run by the state Department of Public Health spurred low levels of PCB in the blood of a significant a margin of safety into such standards as that they should be 100 times below the level which causes poisoning in lab animals or 10 times below what causes ill effects in man.

The scientific controversy surrounding both chemicals is being studied by a special subcommittee of the U.S. Department of Health, Education and Welfare Interagency Coordinating Committee on Toxicological Problems. The subcommittee is headed by Dr. Albert Kolbye, the FDA's associate director of science.

Despite the concern about the possible additive effects of the two families of chemicals, both epidemiologist Dr. Pirooz Cordle — Kolbye's assistant — and Dr. David P. Rall — who is both head of the parent committee and director of the National Institutes for Environmental Health Sciences — said they were not aware of any research into that potential threat.

Moreover, Cordle said the FDA would not consider whether to begin a formal review of the safety standards for either PCB or PBB until it received an "information" report from Rall's parent committee.

Rall is also waiting.

"I must confess I was waiting for Kolbye's subcommittee to report to pull together my thoughts on PBB," he told The News.

"I do think a lot of research needs to be done. But I don't think there is any question that the effects of PCB and PBB will be additive. It is almost a given. they are very, very similar compounds.

Another area of scientific concern and near total ignorance is whether PCB and PBB might interact with any of the scores of other environmental contaminants in our bodies.

PBB is the short name for a mixture of chemicals called polybrominated biphenyls which are manufactured by the Michigan Chemical Co., St. Louis. Mich., for use as a fire retardant.

Three years ago, an estimated 780 pounds of the Michigan Chemical product were accidentally sent to the Michigan Farm Bureau where it was mixed with livestock feed and sold to hundreds of farmers, mainly in the western part of the state.

An estimated 32,000 cattle were condemned because more fat tissue contained more than three-tenths of 1 part per million PBB — the FDA standard.

Most of the more than 500 persons tested for PBB by the Michigan Health Department have some of the chemical in their systems, but the department's epidemiologists have been unable to show any specific sudden diseases resulting from the chemical.

number of people, The News has learned.

Those are people from the same part of the state experiencing the severest PBB exposure.

The FDA's standard of 5 parts per million PCB in fish fat was based in part on the Japanese PCB poisoning incident in 1968. In addition to the deaths, some 1,000 others suffered such conditions as severely inflamed scrotums, discoloration of the skin and nails, toothless, numbness, headaches, liver damage and some apparent nerve damage.

But the Michigan Public Health Department's Dr. Harold Humphrey, an environmental epidemiologist who is studying the human effects of both PCB and PBB, said:

"It hasn't come out until nearly 10 years after the fact, but the Japanese version of PCB was contaminated with chemicals known as chlorinated dibenzofurans, which we know are highly poisonous."

Dr. John Liddle, assistant chief of the federal Center for Disease Control's toxicology branch, agreed that "a great deal" of the Japanese illness could have been caused by the furan chemicals.

"The furans are preferentially absorbed into the liver over PCB by close to 1,000 times. Abnormally high levels have been reported in liver biopsies of the Japanese."

Environmental Health Sciences chief Dorrel Rall said the PCB produced by Monsanto in the U.S. is "much cleaner" than the Japanese counterpart, but added that even a pure PCB may degenerate over time and eventually contain a variety of furans.

His institute wants to find out whether the PCB's in the American environment also contain furans, but has been unable to set up the right test conditions.

The FDA's Cordle, disagreeing with his fellow scientists, said:

"From what we know about them now, the PCB contaminants will not have an effect on the guidelines unless we see some new information about something extraordinary."

Nevertheless, the contamination of the Japanese PCB's has led researchers across the country to wonder whether the PBB's produced by Michigan Chemical might also be contaminated.

Michigan Chemical's PBB is not all that well tested — even in the same sample — and their quality control does not exist to a real homogenized material," said the Cancer Institute's Flamm.

Added Michigan Health Department chemist Dr. Harold Price:

"We're waiting for contaminants, but the quality control was bad. One might find something entirely different in another sample."

Attorneys for a group of farmers suing both Michigan Chemical and the Farm Bureau for damages did send a PBB sample to Harvard University research biologist Dr. Patrick O'Keefe.

O'Keefe told The News his sample contained about 25 parts per million of a contaminant called brominated naphthylene — a poisonous chemical about which very little is known.

The Harvard scientist said he had other questionable findings" that he was not willing to discuss at this time.

University of Michigan researcher Dr. Thomas Corbett, who has reported that high doses of PBB causes malformations at his test mice and rats, said chlorinated naphthylene — a sister compound — had damaged some cattle in a poisoning incident in the 1940's.

He said the symptoms from what farmers then called "X disease" were similar to what Michigan cattle involved in the PBB incident experienced.

Dr. Rall, however, suggested that only 25 parts per million contaminated naphthylene was unlikely to have human health consequences.

It was pointed out that a person eating beef containing the FDA maximum of three-tenths of 1 part per million PBB would be exposed to only 7.5 parts per trillion of the naphthylene — many times below the level which can be measured.

But the possibility that PBB may be contaminated by brominated dibenzofurans — a parallel chemical to the chlorinated dibenzofurans in the Japanese PCB — could be significant.

The theory behind that — and researchers concede it is only a theory — is that the human liver might have a thousandfold preference for the bromine version of the chemical just as it does for the chlorine version.

Dr. Renate Kimbrough, the Center for Disease Control's medical officer in toxicology, said her division's chemists have begun to look for such contaminants in PBB samples from Michigan but have not yet started any.

However, she pointed PBB samples from several different sources on the shaved ears of rabbits, got a rash on some — indicating contaminants — but not on others.

The rash, she said, suggests that at least some of the PBB is contaminated either with a furan or some other poisonous triple chemical. But she emphasized that no firm conclusions can be drawn without confirmation from her chemists.

After reviewing the lack of hard scientific information on PCB and PBB and the almost untrusted connections the researchers seem to be uncovering, Dr. Rall was asked:

Aren't we making public policy decisions by piling an inference upon an inference upon a suggestion?"

Responded the government's top toxicologist:

"That's where it is."

TOMORROW: Cancer and birth defect fears.

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