Monsanto

Dept. of Medicine & Environmental Health P.L. Wright, G2WF (4-8810)

DATE: January 15,1981

SUBJECT: PCB's in Human Milk

REFERENCE:

FROM: G.L. Levinskas, G2WF
J.H. Senger, G2WE

TO G. Roush, G2WG

John Craddock's attached summary of PCB content in human milk was prepared in response to a specific inquiry about a statement in the Ralph Nader, edited book, "Who's Poisoning America."

I have prepared a modification to reflect a wider range of human milk fat concentrations, PCB concentrations and to restate the conclusions reached by NIOSH.

John indicated, that a modification of this statement be prepared to use as a general reply to questions relating to PCB content in human milk. A modification of the original statement is also attached.

P.L. Wright

PLW:w5/1

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IN-10M (REV. 2/78)

Response to general inquiries on PCB content in human milk.

Analysis of tissues and biological fluids obtained from individuals from several geographical locations have shown that PCB's are present at low levels in specimens from some people. It is well known that since PCB's are fat soluble, they will be present in the highest concentrations in those tissues or fluids containing the highest amount of fat. Human milk contains approximately 2.8 to 3.8 percent fat. Thus, if PCB's are present in the body, some will be secreted into the milk. Not all human milk samples that have been analyzed, have been found to contain PCB's. In those samples with detectable PCB's, the approximate concentration on a whole milk basis was 50 parts per billion (ppb)[1,2]. This would be equivalent to approximately 1.3 to 1.8 parts per million (ppm) expressed on a milk fat basis.

Currently the Food and Drug Administration (FDA) has established a PCB tolerance of 1.5 ppm, on a fat basis, in milk and manufactured dairy products. This tolerance is almost identical to those concentrations that may be present in human milk.

While preparing a PCB criteria document[2] the National Institute for Occupational Safety and Health (NIOSH), reviewed the available information on PCB concentrations in tissues and biological fluids and the available health status of the populations reported on. Relative to the concentrations observed, NIOSH concluded "...no adverse effects have been associated with PCB's at the concentrations found in adipose tissue, blood, or milk of individuals whose only known exposures were from general environmental contamination...".

1. Final Report of the Subcommittee on the Health Effects of Polychlorinated Biphenyls and Polybrominated Biphenyls. Department of Health, Education and Welfare, Washington, D.C., July, 1976

2. Criteria For A Recommended Standard - Occupational Exposure To Polychlorinated Biphenyls (PCBs). U.S. Department of Health, Education and Welfare. Public Health Service, Center for Disease Control, National Institute for Occupational Safety and Health Washington, D.C., September, 1977

Response to inquiry relative to Nader comment on PCB content in human milk.

The statement regarding PCBs in mothers' milk as it appears in the book "Who's Poisoning America," edited by Nader, et al, Page 178, is misleading. The author creates confusion by failing to specify whether the PCB concentrations are based upon fat content or whole milk content. Tbis distinction is extremely important in evaluating potential PCB exposure.

NADER STATES:

> "The average level (of PCBs) found in the mothers' milk --1.8 parts per million (ppm) -- is seven times greater than the amount permitted by the Food and Drug Administration in milk for sale. One nursing mother in Michigan bad 10.6 ppm of PCBs in her milk --"

Numerous other studies dealing with the concentrations of PCB's in human milk have been reported[1,2]. Not all samples contained PCB's. In those samples with detectable PCB's, the approximate concentration on a whole milk basis was 50 parts per billion (ppb). Human milk contains a range of 2.8 to 3.8 percent fat; thus, the concentration of PCB's on a fat basis would be 1.3 to 1.8 parts per million. No reports of concentrations of PCB's approaching the part per million level in whole milk exist. Therefore, the data present in the Nader book should have stated 1.8 ppm on a fat basis. This concentration is similar to those in other reports and is approximately the same as the current Food and Drug Administration (FDA) tolerance of 1.5 ppm, on a fat bases in milk and manufactured dairy products. The highest level Nader reports would be equivalent to approximately 300 ppb in whole milk.

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"Mothers' Milk"
Inquiry/Response

The statement regarding PCBs in mothers' milk as it appears in the book "Who's Poisoning America," edited by Nader, et al, Page 178, is misleading. The author, by omission, misstates the scientific basis for expressing the concentration level of PCBs in the mothers' milk samples cited --

> "The average level (of PCBs) found in the mothers' milk -- 1.8 parts per million (ppm) -- is seven times greater than the amount permitted by the Food and Drug Administration in milk for sale. One nursing mother in Michigan had 10.6 ppm of PCBs in her milk --"

In fact, PCBs have been found in mothers' milk as well as human adipose tissue at very low levels. It is well-known that PCBs are fat soluble and thus collect in body fats -- including milk fat and tissue (adipose) fat. However, the scientific basis for expressing the concentration of PCBs in any sample, including human fluids, and tissue must be known and stated before a meaningful conclusion can be reached as to the significance of the measurements.

Human milk contains on an average about 2.8% fat. Thus the data presented in the Nader book should have stated 1.8 ppm on a "fat basis," which is equivalent to about 50 ppb (parts per billion) or 0.05 ppm on a whole milk basis. This is essentially the same level within experimental error allowed by FDA (1.8 ppm vs. 1.5 ppm FDA level -- fat basis) for milk products, not a factor seven-fold higher as stated in the Nader book.

The National Institute for Occupational Safety and Health has done several studies on PCBs in humans, including mothers from 40 states who had PCBs in their milk. No adverse health effects were observed in any of these studies or, to the best of our knowledge, in any other study involving groups of people exposed to PCBs in this country.

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