



State University of New York
Health Science Center
Syracuse

Clinical Campus

P.O. Box 1000
Binghamton, NY 13902

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Dr. William Farland, Director
Dioxin Reassessment Project
U.S. Environmental Protection Agency
Room 3700 WSM (RD-689)

Dear Dr. Farland:

As a public health physician specialist and a professor of preventive medicine at a SUNY medical school, working exclusively in dioxin health-related areas, I have prepared this letter in the hope that it may be of use to EPA in your current reassessment of (1) Exposure to, and (2) Health Assessments of, dioxins. In addition to the comments, I am enclosing a bibliography of relevant articles which my colleagues and I have published (all numbers referenced below are from my bibliography), and one copy each of some of our key reprints referenced in this letter, in the hope that they will be of assistance to you and your colleagues in this important matter.

Introduction

Dioxins and closely related compounds, such as the halogenated dibenzofurans and PCBs, are highly toxic with a multitude of toxic endpoints in a variety of animal species, including humans. I share EPA's interpretation of the scientific literature concerning dioxin's etiologic role in the following areas: increased rates of cancers; adverse reproductive and developmental toxic effects; immune deficiency; central and peripheral nervous system damage; liver damage; increase in blood lipid levels, consistent with increase in adverse cardiovascular outcome such as atherosclerosis and coronary artery occlusion and myocardial infarction (heart attack) and cerebrovascular occlusion (stroke), as well as hypertension; liver damage; skin damage; endocrine disruption, including diabetes mellitus, altered testosterone and thyroid hormone levels; and perhaps altered sexual structure and behavior in offspring of females exposed to dioxins.

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Dioxins are highly persistent, almost always have an industrial source and, therefore, are historically recent. They are currently found in characteristic but different amounts and patterns in human tissues from industrial and also from non-industrial countries. The levels are higher in humans from industrial countries and lower in non-industrial countries (123, 164). As we have observed recently, dioxin-like PCBs seem to double the total dioxin-like toxicity found in tissues of Americans at this time (130, 131, 148, 151, 156, 164). Our research over the past few years demonstrated that Americans and persons from other industrialized countries have a much higher level of dioxins in their bodies in fat, milk and blood than do persons from less industrialized countries, such as China, Vietnam, Cambodia, Thailand, India, Pakistan, Africa, Russia and other countries (82, 92, 97, 100, 103, 109, 113, 121, 123, 156-158, 164, 166). We also find measurable amounts of dioxins in stillborn and placental tissue (116, 136), and even fetal tissue ("Chlorinated Dioxin and Dibenzofuran Levels in U.S. Human Placentas and Fetal Tissue in Comparison with U.S. Adult Population Dioxin Levels," by A.J. Schecter, O. Päpke, A. Lis and M. Ball, presented at Dioxin '94, Kyoto, Japan, November 21-25, 1994), documenting transplacental, and hence unavoidable, dioxin intake from the point of conception so long as dioxin contamination of the environment persists. In my judgement, this points out the need for strict, enforced, national and international environmental regulations.

The highest daily intake of dioxins is currently found in nursing infants from the United States and other industrial countries, where daily intake by far exceeds levels considered acceptable for the much-less-sensitive adults, based on cancer risk estimates (74, 79).

The peer-reviewed literature seems to support the conclusion that cancer is a relatively insensitive outcome following dioxin exposure, and that smaller amounts of dioxins may lead to increases in adverse reproductive, developmental, and immunological consequences. The literature also supports the findings that humans appear to be an intermediate species, as compared to sensitive laboratory rodents, for sensitivity to dioxins and that human tissue, for certain biochemical endpoints, has not always demonstrated a threshold. Wildlife appear to be most sensitive to dioxins and dioxin-like chemicals, and government regulations should, it seems to me, consider protection of the most sensitive species, which will also then protect the public health of humans and other species. Thus, if government regulations do err, they will err on the side of protecting the health of humans and the environment. Dioxins and dioxin-like chemicals usually work through a common mechanism of action, through the Ah receptor in the cytoplasm as a first step, in many species and for many toxic endpoints.

Other Issues

1. EPA should be highly commended for its openness during the review. It was a first-rate effort and although unusual, very commendable for a government agency to attempt to be so open. This should help to increase the scientific quality of the final version of the EPA dioxin reassessment. To make this even more the case, I hope you will invite those members of the scientific community who are involved in dioxin research, and environmental and community groups which have key information or points of view, to participate, hopefully at EPA expense, to increase the number of qualified persons who will be able to participate, in further presentations, meetings, or consultations as the process moves from a draft to a final stage.

2. I believe there are major references which should be cited and used in order to avoid duplication of work previously done or omission of important scientific data. The frequency of important omitted references, for example in 9.11 of volume III of the Health Assessment document, Overall Conclusions regarding the impact of dioxin and related compounds on human health,, is the biggest problem I have encountered in a number of areas in the draft documents. Although the various groups, editors, scientists or agencies that prepared the following documents may not agree with all aspects of the EPA assessment, they contain what is regarded by many as important dioxin research, and should be cited, discussed, and evaluated in the EPA review. Some organized sources include, but are not limited to:

A. The book, "Dioxins and Health", Arnold Schecter, Editor, Plenum Press, NYC 1994.

B. The yearly proceedings issues of Chemosphere, for the yearly international dioxin symposia.

C. The draft and final versions of the ATSDR-CDC Toxicological Profiles for

- a. Dioxins,
- b. Dibenzofurans,
- c. PCBs.

D. The Institute of Medicine of the National Academy of Science's report, "Veterans and Agent Orange: Health Effects of Herbicides Used in Vietnam", report 1993, book 1994.

E. Fukuoka Acta Medica, Yusho volumes, issues on alternate years since the Yusho rice oil poisoning incident (involving PCBs, dioxins and dibenzofurans) of 1968.