DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE
FOOD AND DRUG ADMINISTRATION

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This may be of interest

Date: July 16, 1970

Reply to Attn of: Dr. Kent J. Davis, BF-155

Subject: Histologic Examination of Livers from Rats Fed Aroclor 1254 and Aroclor 1260 for Ninety Days

To: Mr. Walter Hansen
Residue Toxicology Branch, BF-219

Thru: Dr. Clara H. Williams
Asst. Chief, Residue Toxicology Branch, BF-219

Thru: J. W. Cook, Acting Director
Division of Pesticide Chemistry and Toxicology, BF-210

Thru: Dr. Henry Fischbach, Director
Office of Pesticides, BF-200

Thru: Dr. Keith Lewis, Acting Director
Office of Foods and Nutritional Sciences, BF-100

Thru: Dr. Bert J. Vos, Acting Director Bert J. Vos 7-16-70
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Thru: Dr. Howard L. Richardson, Deputy Director (out of town. 16 July 70 KD.TIVE)
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Hematoxin-eosin stained paraffin sections of formalin fixed livers from rats fed Aroclor 1260 and other rats fed Aroclor 1254 at dose levels of 0, 25, 75, 150, 300, and 500 ppm for ninety days were examined by light microscopy. Replicate sections of some tissue blocks were stained with P.A.S. and P.T.A.H. stains.

No attempt was made to maintain individual animal identity on each section but instead livers were grouped by sex and dose level so that two or three liver sections were in each paraffin block. A total of 139 livers were examined and these represented four to eight animals of each sex at each dose level.

Livers from male rats fed 25 ppm. aroclor 1260 appeared slightly enlarged and microscopically there is zonal cellular hyperplasia with the larger cells located centro-lobularly. Occasional parenchymal cells show either more prominent cytoplasmic chromatin granulation or the margination of chromatin granules that has been referred to as the D.D.T. or chloronated hydrocarbon change. The significance of

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this type change is debatable. There is little progression or intensification of this "sick liver" appearance up through the 300 ppm. dose level rats, however, a couple of rats at the 300 ppm. level (and one at 300 ppm.) have the added degenerative change of isolated, greatly enlarged hepatic cells with multiple small fatty cytoplasmic vacuoles. Females fed aroclor 1260 appeared about one dose level more resistant than males, i.e. the 25 ppm. level livers show only slight zonal hyperplasia, and gross enlargement is first noted at the 75 ppm. levels. The 150 ppm. hepatic sections show the first pronounced "sick liver" appearance and only one of the 300 ppm. liver sections shows focal fatty infiltration. Again of the small vacuole type.

Liver sections from male rats fed 25 ppm. aroclor 1254 vary from essentially normal to slightly hyperplastic or enlarged due to increased cytoplasmic volume. Lobular zonal differences are minor and "chlorinated" hepatic cell changes are first noted in a couple of livers in the 75 ppm. dose level group. Males on the 300 ppm. level show definitely "sick livers" with focal fatty infiltration in at least three of seven sections examined. Similar changes are noted in the 500 ppm. male livers with little or no increase in severity over the 300 ppm. rats.

Females on the 25 ppm. aroclor 1254 study have liver sections essentially morphologically equivalent to controls. Abnormalities are minimal at the 75 ppm. dose level, and are definite at the 150 ppm. level. These changes are similar in type to those described previously for other groups at mid-dose levels. Liver sections from the 500 ppm. aroclor 1254 females show the most severe lesions of any of the test groups in this survey. There is moderate fatty metamorphis in three of five livers (sl. focal fatty infiltration in the other two) and slight hepatic fibrosis as well as the usual hyperplasia and "sick liver" appearance; however, cytoplasmic chromatin granularity or margination is not apparent in this group.

The hepatic lesions in many of the lower test level aroclor rats in this experiment are not impressive as isolated observations, and could be noted as "nothing of note," if not specifically looked for. In view of the type of hepatic cytoplasmic changes seen, I have suggested electron microscopy on future aroclor rats and understand that Dr. Brown and Mr. Hansen have discussed preliminary arrangements for such a study.

Kent J. Davis, D.V.M.

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