DAVID OTIS WILSON AND

DEBRA B. WILSON,

Plaintiffs,

vs.

THE ROE CHEMICAL COMPANY,

Defendant.

_____/

TRANSCRIPTION OF SWORN DEPOSITION

DANIEL BAKER TOWE, PH.D.

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P R O C E E D I N G S

Q. Dr. Towe, would you state your full name, please.

A. Dr. Daniel Baker Towe.

Q. Who is your employer?

A. Roe Chemical, working in the toxicology department, for five years.

Q. Would you give us a little bit of your educational background.

A. Four years of undergraduate study in the field of biology, four years of graduate study in toxicology.

Q. Do you have a doctorate in toxicology?

A. Ph.D.

Q. In your employment with the toxicology department with Roe Chemical, what is your main job?

A. I'm head of the department.

Q. Just what do you do?

A. I run experiments on design chemicals and recommend what should be put on labels.

Q. Are you familiar with the product Pre-merge Dinitro?

A. Yes. Through the experiments which I conducted at the labs here at Roe. We ran a series of several tests on different compounds for

alkyldinitro phenols. We ran a series of tests on three different lab animals, including rats, mice, and rabbits. We then published those results in an article I co-authored.

Q. What was the purpose of the tests?

A. The purpose of the test was to find out the toxic effects in relation to how it would affect man or how it would affect these animals, and to help write the warning labels.

Q. What different compounds did you test?

A. The different compounds of dinitrophenol that are structurally similar. We experimented with five of the chemicals: 2,4- dinitrophenol; 4, 6-dinitro-o-cresol; 2-sec buty1 4,6- dinitrophenol; 2-cyclohexy1 4,6-dinitrophenol; 2-cyclohexyl 4,6-dinitrophenol compound with dicyclohexylamine.

Q. Would you go into a little more detail on the tests that you performed and give us the results of some of the tests on the different lab animals?

A. The first experiment we did was on rabbits. Each chemical was tested on 20 rabbits. We exposed four groups of five rabbits to a different concentration. We also had five controls that were dosed with saline. We found no statistically significant differences between the exposed rabbits

and the control rabbits. This suggested that skin exposure to Dinitro would not produce harmful effects in humans.

Q. Were there any differences regardless of whether they were statistically significant?

A. Rabbits in three of the test groups exhibited symptoms consistent with a fever.

Q. Were any of those chemicals that produced this result 2-sec butyl 4,6-dinitrophenol?

A. Yes.

Q. What was the concentration of the Dinitro that produced the symptoms?

A. The rabbits reacted only to the highest concentration. The highest concentration was undiluted Dinitro.

Q. Was there any reason for using rabbits?

A. Yes. An animal is selected on the basis of its similar physiological comparative anatomy to man, and that's why we chose rabbits.

Q. There were two other lab animals that you mentioned, laboratory rats and mice, correct?

A. Yes.

Q. Would you explain the testing on those animals and the results?

A. The skin absorption testing on the rats was

done in the same manner as the rabbits. We also did two other experiments to determine the effects from ingestion. We created 5 groups of 20 rats. Each group was fed one of the 5 chemicals we tested; 4 rats in each group of 20 were fed a single dose of varying concentration. We also had 5 controls. The other experiment involved oral daily dosing 100 rats over a 6-month period with each of 5 groups being fed one of the chemicals.

Q. Was 2-sec butyl 4,6-dinitrophenol tested for six months?

A. Yes.

Q. What results did you get in your single dose experiment?

A. Some of the rats getting the highest dose developed high fevers. We found this reaction in response to three of the chemicals. One rat out of the 100 that we tested in the single dose experiment died at the highest dose.

Q. What chemical was fed to the rat that died?

A. The chemical was fed to the rats in their water and mixed with their food. The total daily amount fed to the rats was equal to .01 percent, .10 percent, 1 percent or 5 percent of their body weight. The average weight of the rats was 400

grams.

Q. What results did you find in the chronic testing?

A. Some rats at the two highest doses developed what appeared to be neurological deficits. However, the frequency of this result was only marginally statistically significant.

Q. Based upon the tests and the results, did you conclude that any of the compounds had any toxic effect in the rats?

A. Yes. The skin testing produced some pyretic effects. The one death from the single oral dose was not a statistically significant result. Only six rats died in the chronic testing.

Q. And what caused the pyretic effect that you mentioned?

A. The mechanism that caused the pyretic effect is not understood completely.

Q. Which chemicals produced the reactions you've mentioned?

A. 2-sec butyl 4,6-dinitrophenol, 4,6-dinitro-o-cresol, and 2,4- dinitrophenol.

Q. So three out of the five compounds had some toxicity, and Dinitro had a fatal effect in one rat in the single dose experiment and killed two rats in

three of the five groups tested?

A. Yes.

Q. Are 4,6-dinitro-o-cresol and 2,4-dinitrophenol structurally similar to 2-sec butyl 4,6- dinitrophenol?

A. Yes.

Q. Describe the testing that was done on the mice.

A. The mice were tested in much the same way as the rats except the long-term studies ran eighteen months. That was pretty much a lifetime study for mice.

Q. What results did you see in the testing that was done with skin application?

A. The mice had slightly greater toxic reactions to the chemicals than rats and rabbits. More mice developed fevers at lower concentrations with the skin absorption than the rats. In addition, two of the mice died from the skin absorption study done with Dinitro (2-sec butyl4,6-dinitrophenol).

Q. What results were seen in the single oral dose testing?

A. Five of the mice fed the two highest concentrations of Dinitro died within seven days of

being dosed.

Q. This means that 50 percent of the mice fed the two highest quantities of Dinitro died?

A. Yes.

Q. What results did you achieve with the chronic feeding study in the mice?

A. Among the one hundred exposed mice, we were surprised to find two that died from liver cancer. We had not seen this in the rats. Approximately 20 percent of the mice exposed to Dinitro became ataxic. Some of those had begun to drag their hind legs before they were sacrificed and autopsied.

Q. What were the findings on autopsy?

A. Some of the animals exhibited muscle wasting and loss of nerve axons.

Q. Were any of the rabbits or rats autopsied?

A. No.

Q. How much was fed to the mice that became ataxic?

A. Mice exhibiting this symptom had received the three highest concentrations.

Q. What is the average weight of the mice that were used?

A. Approximately thirty grams.

Q. Of the three compounds that you described

had a toxic effect, which, in your opinion, was the most toxic?

A. 2-sec butyl 4,6-dinitrophenol. It proved to be the most toxic when applied both to the skin and by ingestion.

Q. Going back to the skin absorption studies for a moment, how long was the chemical allowed to stay on the skin of the animals?

A. We followed the animals for two weeks after the single application. That excludes, of course, the few that died within two weeks of the chemical being applied to the skin.

Q. What precautions were taken by the lab technicians to prevent any contact with these compounds?

A. The only precautions taken to handle the chemicals were extreme care, plus gloves, of course.

Q. You didn't handle these chemicals under a hood or in an enclosed environment?

A. No.

Q. Your chemists are trained to be safe and careful in handling dangerous chemicals, aren't they?

A. Yes.

Q. So it was your opinion that there was no

danger to the lab technicians as long as they handled the compounds with care?

A. Yes, and wore gloves.

Q. And there was no reason to worry about any type of accident, any type of spill of the compounds?

A. No. Even a spill of the compounds on the skin would not have caused any reaction from the body. All that needed to be done was immediate washing. That's what we put on the label.

Q. Did you see any reason to put directions on the label about how a person should pour or get the chemicals out of the container?

A. No. I was only interested in the effect of the compounds, which were safe when properly used.

Q. If the laboratory animals had been washed immediately after application of these compounds, would there have been any toxic effect to them?

A. If we had done those tests and left the chemical on for only a short period, 15 minutes, there would be no fatalities.

Q. So in other words, some applications were left on for an appreciable amount of time?

A. Yes.

Q. Could you tell us when the first animal

died after application of the 2-sec butyl 4,6-dinitrophenol?

A. Twenty-four hours after application of the 2-sec butyl 4,6-dinitrophenol, a death occurred among the mice.

Q. Dinitrophenols, as a group, have been in use for how long or since when?

A. Dinitrophenols were first used approximately 100 years ago.

Q. But you don't know if that is a commercial use?

A. It has been in commercial use over that period of time. It is used extensively in sprays for control of pests, insects, mites, et cetera.

Q. Is the compound 2-sec butyl 4,6-dinitrophenol included in your answer?

A. Yes.

Q. In your opinion, Dr. Towe, would contact with skin by this chemical have any harmful effects or toxic effects on a human being regardless of the concentration?

A. Obviously, any compound if used in heavy concentration may cause problems, but if used properly, it will not produce toxic reactions.

Q. What, in your opinion, is a concentration

of Dinitro that will not cause a problem if spilled on skin?

A. We can't foresee that someone would take a bath in the stuff. We can't be blamed for that. If so, aspirin would be considered abnormally dangerous. Weed killers have to be toxic to work, period.

Q. And what, in your opinion, would be a safe concentration of Dinitro?

A. Providing that it wasn't put on the skin and held on for a prolonged period of time, I believe that a heavy concentration of the chemical would not be harmful.

Q. Could you narrow down approximately what a heavy concentration might be? 50 percent?

A. Even if a 100 percent application of this compound were applied to your skin, and was washed off within, say, 20 or 30 minutes, the effects of the chemical would most likely not be absorbed into the skin, perhaps a little irritation, but nothing to the extent that it would be fatal.

Our tests indicated what the symptoms of poisoning would be, and we put it on the label. I have heard Mr. Wilson admit that he suffered none of those symptoms.

Q. Do you think it could have any permanent, harmful effects?

A. Nothing permanent if it was washed off in a reasonable amount of time.

Q. Did you ever do any studies on humans using Dinitro?

A. Not personally.

Q. Doesn't the mortality in the lab animals suggest Dinitro can cause serious illness or death in humans?

A. No. The animal mortality is explained by the dose given to small animals. It would take a much larger dose to yield the same effects on a human being.

Q. If a human being were 10 times larger than a rabbit or rat, are you saying it would take 10 times more concentration of the chemical to have the same effect?

A. Yes.

Q. In your opinion, are these chemicals toxic?

A. Yes.

Q. In your opinion, are these chemicals hazardous if used in a reasonable manner?

A. No.

Q. Would you have advocated against the

marketing Dinitro if you found it to be hazardous or an ultra-hazardous chemical?

A. Yes. I've stopped Roe in the past from putting products on the market that were too toxic or dangerous. We err on the side of caution. Of course, the government also plays a role.

Q. What is Roe's procedure after tests are made?

A. We confer with other specialists in the field, our marketing department, and suggest language to adequately warn users. We carefully consult federal law, write the label, and then submit it and all tests to the government.

In the case of Pre-merge Dinitro, the government approved the label and warnings. They were clear, concise, and informative. We put skull and crossbones, indicated that it could be fatal, put "absorbed through the skin," "do not get on skin," even medical instructions.

We at Roe feel a double obligation to the farmer, to provide him with chemicals that will work and to properly warn him. Accidents happen, but we cannot be blamed. As a part of my job, I receive all medical reports when any of our chemicals cause any injury. Despite hundreds of thousands of

applications, there are only a handful of unsubstantiated adverse reaction reports. This product has an extremely low incident rate.

(Deposition concluded)