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Objective: To determine bioavailability of dioxin in Missouri soil samples.

Species: Guinea pigs, Hartley, male, 200-250 grams, 6 animals/group.

Experimental Groups:

1. 2,3,7,8-TCDD in corn oil, 1 $\mu$ g/kg bw, volume 0.1ml/100g bw
2. 2,3,7,8-TCDD in corn oil, 3 $\mu$ g/kg bw
3. Corn oil control - vol 0.1ml/100g bw
4. Times Beach contaminated soil - quantity to equal 1 $\mu$ g TCDD/kg bw
5. Times Beach contaminated soil - quantity to equal 3 $\mu$ g TCDD/kg bw
6. Times Beach contaminated soil - quantity to equal 10 $\mu$ g TCDD/kg bw
7. Minker site contaminated soil - quantity to equal 1 $\mu$ g TCDD/kg bw
8. Minker site contaminated soil - quantity to equal 3 $\mu$ g TCDD/kg bw
9. Minker site contaminated soil - quantity to equal 10 $\mu$ g TCDD/kg bw
10. Uncontaminated soil - weight equal to amount used in Group 6
11. Uncontaminated Missouri soil spiked with 2,3,7,8-TCDD, 0.8 $\mu$ g/gram soil, quantity administered to equal 10 $\mu$ g TCDD/kg bw, Group 6
12. Red clay soil sample spiked with 2,3,7,8-TCDD, 0.8 $\mu$ g/gram soil, quantity administered to equal 10 $\mu$ g TCDD/kg bw
13. Sandy soil sample spiked with 2,3,7,8-TCDD, 0.8 $\mu$ g/gram soil, quantity administered to equal 10 $\mu$ g TCDD/kg bw
14. Loam soil sample spiked with 2,3,7,8-TCDD 0.8 $\mu$ g/gram soil, quantity administered to equal 10 $\mu$ g TCDD/kg bw.

Experimental Design: Guinea pigs will be allowed to acclimate for 6-7 days after arrival at NIEHS. Guinea pigs will be individually housed in disposable cages (45x20x20cm) with food and water available ad libitum. One day prior to dosing, animals will be transferred to the high hazard animal facility, Room 1421. \*All animals will be lightly anesthetized with Metafane.

\* Guinea pigs will be weighed and randomly assigned to experimental groups. Food will be withheld for 24 hours prior to dosing.

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Those receiving TCDD in corn oil and corn oil alone will be gavaged using a 20 gauge 1 and 1/2 inch stainless steel needle. Guinea pigs receiving soil samples will be intubated using polyethylene tubing, PE190.

Animals will remain in high hazard room for a minimum of 48 hours before being transferred back to Bldg. 15 animal facility. Guinea pigs will be observed daily and weighed three times per week for 30 days.

Parameters Evaluated:      Body weight changes  
                                 Organ weights  
                                 Histopathology  
                                 Deaths

On day 30, guinea pigs will be weighed and euthanized using carbon dioxide. Animals will be observed for any gross changes with organs in situ. The following organs will be removed and weighed and fixed in NBF, 10%, for subsequent histopathologic evaluation: brain, thymus, spleen, right kidney, liver and right testicle. These organs will be removed and fixed in NBF, 10%, for subsequent histopathology: liver/gall bladder, thymus, spleen, left kidney, urinary bladder, stomach and left testicle.

Any animals becoming moribund or dying during the 30 day experimental period will be weighed and opened, observing organs in situ. Tissues listed above will be fixed in Neutral Buffered Formalin, 10%, for subsequent histopathology.

Preliminary analyses of Missouri soil samples by Analytical Chemistry Group indicate ~ 600ppb 2,3,7,8-TCDD in the Times Beach sample and ~ 800ppb 2,3,7,8-TCDD in the Minker site sample. Mean body weights of experimental groups will be used for calculating quantity of soil required for each group. The soil sample for each animal will be mixed with 5ml distilled water for administration.

#### Soil Samples:

Four soil samples collected from 4 areas in Missouri on March 1, 1983 and delivered to NIEHS on March 3, 1983 were stored in Special Handling Laboratory, NIEHS Warehouse. All manipulations of bulk soil samples were carried out in this laboratory. Samples, identified as AK8201, AK8202, AK8204 and AK8205, were spread on stainless steel trays and allowed to air dry for approximately 40 hours. Each sample, with the exception of AK8204, Minker site uncontaminated, was sieved through 1/4" stainless steel mesh screen to remove rocks and vegetable matter. Sample AK8204 was not sufficiently dry at this point for screening or mixing and was put aside for later processing. Each of the three sieved samples were mixed for 20 minutes in a P-K Twin Shell Laboratory Blender. The blended samples were stored in individual 24 quart stainless steel containers with tops in Special Handling Laboratory, NIEHS Warehouse. An aliquot of each blended soil sample was analyzed and results reported by Dr. J.R. Hass in a memorandum to Director, NIEHS dated April 26, 1983.

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Preparation of Soil Samples for Bioavailability Testing: Sample AK8202, Times Beach contaminated soil - analyzed TCDD concentration  $0.6\mu\text{g}/\text{lg}$  soil. 100 grams of sample AK8202, Times Beach contaminated, will be passed through a 60 mesh stainless steel standard testing sieve, collecting fines. Particles not passing through will be weighed and put into glass containers for subsequent disposal by Health and Safety Office personnel. Fines will be collected and put into glass vials with teflon-lined caps in quantity required for each guinea pig in the three groups (no. 4, 5, and 6) receiving this sample. Quantity required will be calculated using mean body weight of each group. An aliquot of fines will be submitted to Analytical Chemistry Group for analyses. Remaining fines will be stored in a solvent cleaned glass vial in Special Handling Laboratory, NIEHS.

Sample AK8205, Minker site contaminated soil - analyzed TCDD concentration,  $0.8\mu\text{g}/\text{lg}$  soil. Eighty fine grams of sample AK8205 will be processed in same manner as sample AK8202 and administered to Groups 7, 8 and 9 in quantities required.

Sample AK8201, Times Beach uncontaminated soil. One hundred fifty grams of this sample will be processed in same manner as samples AK8202 and AK8205. Fines will be placed in glass vials in quantities sufficient to equal that given guinea pigs in Group 6. A 30g sample of fines will be spiked with 2,3,7,8-TCDD at a level of  $0.8\mu\text{g}$  TCDD/gram soil by Dr. P. Albro and appropriate amounts of this sample will be given to each animal in Group 11. An aliquot of this sample will be submitted for analyses to Analytical Chemistry Group.

The clay, sand and loam samples will be sieved and spiked in the same manner as sample AK8201. Each animal in Groups 12, 13 and 14 will receive appropriate spiked sample in amounts calculated on mean body weights for each group.

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