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Determination of Strontium-90 Levels in White-Tailed Deer in Relation to the Clinton Nuclear Power Plant

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Poster Presentation P45

DETERMINATION OF STRONTIUM-90 LEVELS IN WHITE-TAILED DEER IN RELATION TO THE CLINTON NUCLEAR POWER PLANT

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Strontium-90 is only one of a number of radionuclides (i.e., radioactive isotopes) that are released into the atmosphere by nuclear power reactors. Strontium-90, which has a half life of approximately 29 years, is of particular interest because it is a calcium analogue that accumulates in the bones and teeth of organisms after it is ingested. Upon deposition, strontium-90 decays, releasing two high energy beta particles. Energy from these particles has the potential to cause damage to cells and tissues. Previous studies have suggested that human infant mortality rates and cancer rates increased when nuclear power plants were online compared to when they were offline. Despite the fact that Illinois has more operational nuclear power plants than any other state, radionuclides are monitored and publicly reported by the U.S. Environmental Protection Agency only from the Chicago area. The purpose of our study was to determine if strontium-90 was present in 60 adult (> 1.5 yrs), female white-tailed deer (*Odocoileus virginianus*) harvested by hunters during the 2004 firearm hunting season in counties upwind and downwind from the Clinton nuclear power plant. The teeth were extracted from the deer and were sent to REMS, Inc., a radiochemistry lab in Waterloo, Ontario. The teeth were processed according to standard procedures and Strontium-90 levels were determined via a scintillation counter. Thus far we have preliminary results from teeth extracted from six deer. Five of the six deer contained Strontium-90 at levels higher than naturally occurring background levels of radiation (3-5 picocuries (pCi/L of air)). Mean ($\pm$ SD pCi/g of Ca) Strontium-90 levels in five deer harvested from DeWitt County, Illinois (the site of the Clinton nuclear plant) ranged from 6.54 ± 0.67 to 48.14 ± 3.41 pCi/g Ca; the overall mean level was 28.18 ± 3.43. The mean Strontium-90 level from one deer from McLean County, Illinois was 26.88 ± 3.23 pCi/g Ca. Statistical analyses will be performed when additional data are available.