

Chlorinated Pesticides: FACTS, AFFECTS & SOURCES

Hexachlorobenzene (HCB)

- Is a by-product of chemical solvents, other compounds containing chlorine, & pesticide manufacturers
- Small amounts can be produced by combustion of waste & other compounds
- Industrial by-product of the Chlor-Alkali & Wood Preservation Industry
- Formerly used as a pesticide until 1965 but is no longer used
- Also formerly used as a fungicide to kill mold and fungi in cereal grains, especially wheat
- ANY level of HCB is considered abnormal and calls for action
- Can cause serious health affects including:
 - o Increased risk for Diabetes
 - o Increased risk for childhood obesity with maternal levels of HCB
 - o Testicular cancer rates are higher in men whose mothers had a high HCB rate
 - o Reduced total T4
 - o Increased rates of soft-tissue sarcomas and thyroid cancers occur in people living close to an industry emitting HCB
 - o Porphyria with neurological manifestations
 - o Increased risk for childhood Otitis Media when HCB is present with DDE
 - o Increased risk for Epstein Barr (early antigen) and Non-Hodgkin's Lymphoma
 - o MAY be related to increased risk of Autoimmunity
 - o Increased chronic fatigue syndrome in people with high levels of HCB and/or DDE
 - o Can suppress gamma-interferon production
- Sources for HCB include:
 - o 25% of ground beef
 - o 66% non-organic butter
 - o 18% American cheese samples
 - o 41% of lamb chops
 - o 50% farmed Atlantic salmon
 - o Living close to a waste facility

Heptachlor Epoxide (HCE)

- Is a chlordane (chlorinated compounds used agriculturally until 1974 & termiticides until 1988)
- Bacteria in soil and human/animal liver can transform heptachlor into a more toxic and biologically persistent epoxide
- *Approved for treatment of fire ants in underground transformers
- Can cause these health affects:
 - Pro-oxidant, difficult to clear through normal detoxification processes
 - Increased cryptorchidism in males whose mother had high levels of HCE
 - Initiator, promoter, and progressor of breast cancer
 - Increased risk of Non-Hodgkin's Lymphoma
 - MAY lead to increased risk of Parkinsonism
 - Increased risk of atherosclerosis when present at high levels with other Chlorinate Pesticides

- Sources for HCE include:
 - Dust (once a house has been treated with a chlordane, it can be found in the dust for the life span of THAT house)
 - Homes built before 1988 (chlordanes were applied in crawlspaces where furnace/air conditioning ducts now exist)
 - Soil being tracked from old farm or vineyard areas that were farmed before 1974 when heptachlor was used on the land
 - Poultry
 - 50% of non-organic butter samples
 - 34% of cream cheese
 - 34% of farmed Atlantic salmon
 - 32% of ground beef
 - 30% of Swiss and cheddar cheese samples
 - 25% of hubbard squash
 - Breast milk of an affected mother

Oxychlordane

- Major metabolite of chlordane and nonachlor compounds used agriculturally until 1974 and residentially until 1988
- Has not been found in food since it is produced by the liver after being exposed to chlordanes and nonachlors from air, water, food
- 8 times more toxic than its parent compounds and is more bioaccumulative
- Can cause these health affects:
 - Increased risk of Diabetes
 - Increased risk of Non-Hodgskin's Lymphoma
 - Increased risk of seminoma (testicular germ cell tumor)
 - Increased risk of prostate cancer
 - In vitro evidence of immunosuppression of cell-mediated immune response to pathogens
 - Decreased natural-killer cell ability to lyse tumor cells
- Sources for Oxychlordane include:
 - The same as listed for HCE (above) as they were mixed together both agriculturally and residentially

Trans-Nonachlor

- Major chlordane compound used agriculturally from 1953-1974 and as a termiticide until 1988
- Can cause these health affects:
 - Very similar in ALL chlordanes (cancer, etc) but at varying rates
 - Increased risk of diabetes and obesity
 - Highest odds for diabetes in organochlorine compounds
- Sources for Trans-Nonachlor include:
 - The same as listed for the above two Chlorinated Pesticides with dirt and dust being among the most common
 - 25% of sweet cucumber pickles

DDE

- Is a metabolite of DDT
- Most abundant
- When in the human body DDT breaks down into DDE in about 6 months
- First synthesized in 1874
- Pesticide ability discovered in 1939 and was used during the war to control typhus and malaria
- Used in agriculture from 1945 to 1972
- Although banned from use in the US was still made there to be shipped out
- Stored in fatty tissue, liver and brain
- Can cause these health affects:
 - Ongoing neurological problems (cognitive difficulties, depression, heaches)
 - Hyporeflexia, attention problems, mental delays, psychomotor delays, impairment of cognitive skills in infants
 - Otitis media and recurrent otitis media when exposed prenatally
 - Increased rate of asthma in children
 - Increased risk of mast-cell degeneration, allergy, asthma
 - Significantly reduces mitogen-induced lymphocyte proliferation response causing cell-mediated immune deficiency and possible risk of herpes zoster
 - Higher levels found in persons with Parkinson's disease
 - In vitro have been found to disrupt the transportation of dopamine in the brain
 - Chronic fatigue syndrome
 - Higher rates of type 2 Diabetes
 - 71% increased risk of developing testicular germ cell tumors
 - Increased risk of developing pancreatic cancer & significantly shorter survival time
 - Almost double the risk for endometrial cancer
 - Increased risk of precocious puberty
 - Pre-term births and small-for-gestational-age babies
 - Most commonly found chlorinated pesticide in a study of infertile women and their partners
 - Multiple abnormalities in semen indices and sperm count, mortality and quality
 - Early menopause
 - Increased risk of endometriosis and reduced functioning natural-killer cells
 - Exposure in utero can lead to altered levels of thyroid hormone
- Sources for DDE include:
 - Farm-raised catfish
 - Non-organic butter
 - Non-organic spinach
 - Farm-raised Atlantic salmon
 - American cheese
 - Lamb chops
 - Non-organic collard greens
 - Non-organic cream cheese

- Quarter-pound cheeseburger
- Non-organic cheddar cheese
- Dirt
- Air
- Sport fishing (if you eat what you catch)

DDT

- Review above information regarding DDE
- Increased risk for liver cancer

Dieldrin

- Used extensively on crops as an insecticide from 1950's-1970
- 1972 approved for killing termites until 1987
- Attaches strongly to soil, sediment and dust particles
- Can be taken up by plants and stored in their leaves and roots
- Any human/animal that eats another animal/plant containing Dieldrin will have higher levels due to bioaccumulation
- Can cause these health affects:
 - Disrupts dopamine transport in the brain
 - Increases oxidative damage in the brain and can cause Parkinsonism
 - Increased hyperthyroidism
 - Affects leydig cells, reduces their testosterone production, can aid in infertility
 - Increased risk of lung cancer, breast cancer, Non-Hodgkin's Lymphoma
 - Increased risk of pancreatic cancer
 - Increases superoxide production and causes neutrophil inflammation
- Sources of Dieldrin include:
 - Summer squash
 - Hubbard squash
 - Dill cucumber pickles
 - Sweet cucumber pickles
 - Raw, peeled cucumbers
 - Pumpkin pie
 - Atlantic salmon
 - Cream cheese
 - Creamy peanut butter
 - Cheddar cheese

Mirex

- Used as a pesticide to control fire ants until 1978
- Used as flame retardant additive under the name Dechlorane in plastics, rubber, paint, paper and electrical goods from 1959 to 1972
- Attaches to soil and dust
- Stored mainly in fat

- Can cause these health affects:
 - In rodents Mirex can cause liver, adrenal, and blood cancer
 - In humans it causes trembling, tiredness, weakness, increased oxidative damage, and neurological and immunological problems
- Sources of Mire include:
 - Primarily eating fish taken from contaminated waters (Most recently reported banned fish in Ohio, New York and Pennsylvania) from Lake Ontario
 - Other contaminated foods as well