PESTICIDE HEALTH EFFECTS ON HUMANS

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CHEMICAL FAMILY: ORGANOPHOSPHATES

- **Action on Human System:** Degrade acetylcholinesterase (an enzyme) in the tissues.
- **Internal Exposure:** Headache, dizziness, weakness, shaking, nausea, stomach cramps, diarrhea, sweating.
- **External Exposure:** Minimal rashes but readily absorbed through the skin.
- **Chronic Exposure:** Loss of appetite, weakness, weight loss, and general feeling of sickness.
- **Type of Pesticide:** Insecticides, acaricides.

CHEMICAL FAMILY: CARBAMATES

- **Action on Human System:** Reversible changes in acetylcholinesterase enzyme of tissues.
- **Internal Exposure:** Headache, dizziness, weakness, shaking, nausea, stomach cramps, diarrhea, sweating.
• **External Exposure:** Minimal rashes but readily absorbed through the skin.
• **Chronic Exposure:** Loss of appetite, weakness, weight loss, and general feeling of sickness.
• **Type of Pesticide:** Insecticides, acaricides.

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**CHEMICAL FAMILY: ORGANOCHLORINES (CHLORINATED HYDROCARBONS)**

• **Action on Human System:** Disrupt function of nervous system, mainly the brain.
• **Internal Exposure:** Headache, dizziness, weakness, shaking, nausea, excitability, disorientation.
• **External Exposure:** Minimal rashes but readily absorbed through the skin.
• **Chronic Exposure:** Some buildup in the fat tissues. May cause nervousness, weakness, and shaking.
• **Type of Pesticide:** Insecticides and acaricides (HCB is a fungicide).

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**CHEMICAL FAMILY: NITROPHENOLIC AND NITROCRESOLIC PESTICIDES**

• **Action on Human System:** Toxic to liver, kidneys, and nervous system.
• **Internal Exposure:** Headache, weakness, thirst, excessive sweating, feeling of overall illness. Yellow stain of skin, hair and urine is characteristic.
• **External Exposure:** Moderately irritating sensations to skin, eyes, nose, and throat.
• **Chronic Exposure:** Weight loss.
• **Type of Pesticide:** Herbicides.

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**CHEMICAL FAMILY: CHLOROPHENOXY PESTICIDES**

• **Action on Human System:** Irritant to lung, stomach and intestinal linings. Injure liver, kidney, and nervous system.
• **Internal Exposure:** Prompt vomiting, burning sensation in stomach, diarrhea, muscle twitching.
• **External Exposure:** Moderately irritating to eyes, skin, and lungs. Chronic Exposure: Do not remain in body; passed out within hours or days.
• **Type of Pesticide:** Herbicides.

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**CHEMICAL FAMILY: PARAQUAT AND DIQUAT**

• **Action on Human System:** Injure skin, nails, cornea, liver, kidney, linings of stomach and intestine, and respiratory system.
• **Internal Exposure:** Burning pain, nausea, vomiting, and diarrhea. External Exposure: Irritates and injures skin and nails.
• **Type of Pesticide:** Herbicides.

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**CHEMICAL FAMILY: THIOCARBAMATES AND DITHIOCARBAMATES**
- **Action on Human System:** Low human toxicity.
- **Internal Exposure:** Nausea, vomiting, diarrhea, weakness, and nasal stuffiness.
- **External Exposure:** Irritating to skin, eyes, nose, and throat.
- **Type of Pesticide:** Fungicides.

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### CHEMICAL FAMILY: PYRETHRINS AND PYRETHROIDS

- **Action on Human System:** Very low human toxicity.
- **Internal Exposure:** Slight toxic reaction.
- **External Exposure:** Swelling of mouth and throat, irritating to nose, throat, eyes.
- **Type of Pesticide:** Insecticides, acaricides.

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### CHEMICAL FAMILY: ARSENICAL PESTICIDES

- **Action on Human System:** Toxic to liver, kidney, brain, bone marrow, and nervous system.
- **Internal Exposure:** Headache, burning stomach pain, vomiting, diarrhea, dizziness. Garlic odor on breath and feces.
- **External Exposure:** Minimal.
- **Chronic Exposure:** Accumulates in body. Chronic headaches, dizziness, stomachaches, salivation, low fever, garlic breath.
- **Type of Pesticide:** Rodenticides, insecticides, acaricides, marine antifouling compounds, desiccants, herbicides, fungicides.

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### CHEMICAL FAMILY: COUMARINS, INDANDIONES, AND OTHER ANTICOAGULANTS

- **Action on Human System:** Prevents blood from clotting.
- **Internal Exposure:** Usually no reaction if low accidental dose ingested.
- **External Exposure:** Minimal.
- **Type of Pesticide:** Rodenticides.

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### CHEMICAL FAMILY: SODIUM FLUOROACETATE

- **Action on Human System:** Extremely toxic. Affects heart tissue and brain.
- **Internal Exposure:** Stomach pain, vomiting, hallucination, nervousness.
- **External Exposure:** Minimal.
- **Type of Pesticide:** Rodenticides.

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### CHEMICAL FAMILY: ZINC PHOSPHIDE

- **Action on Human System:** Highly toxic: severe intestinal irritation; severe injury to liver,
kidneys, nervous system, and heart.
- **Internal Exposure:** Intense nausea, stomach pain, excitement, chills, cough.
- **External Exposure:** Minimal
- **Type of Pesticide:** Rodenticides.

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**CHEMICAL FAMILY: STRYCHNINE AND CRIMIDINE**

- **Action on Human System:** Acts directly on cells in the brain and spinal cord to cause convulsions.
- **Internal Exposure:** Blue skin color; violent convulsions.
- **External Exposure:** Minimal
- **Type of Pesticide:** Rodenticides.

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**CHEMICAL FAMILY: VACOR DLP-787**

- **Action on Human System:** Very toxic; injures nervous system, brain, and area around the heart.
- **Internal Exposure:** Nausea, vomiting, diarrhea, stomach cramps, chills, confusion, weakness, chest pains.
- **External Exposure:** Minimal.
- **Type of Pesticide:** Rodenticides.

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**CHEMICAL FAMILY: RED SQUILL**

- **Action on Human System:** Low toxicity.
- **Internal Exposure:** Prompt vomiting and nausea.
- **External Exposure:** Minimal
- **Chronic Exposure:** Excreted rapidly; not retained in body.
- **Type of Pesticide:** Rodenticides.

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**CHEMICAL FAMILY: ANTU AND NORBORMIDE**

- **Action on Human System:** Selectively toxic to rats; toxic to humans only in huge suicidal doses.
- **Internal Exposure:** Blue skin, labored breathing.
- **External Exposure:** Minimal
- **Chronic Exposure:** Excreted rapidly; not retained in body.
- **Type of Pesticide:** Rodenticides.

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**CHEMICAL FAMILY: SULFUR DIOXIDE, FORMALDEHYDE, CHLOROPICRIN, ANDACROLEIN**
- **Action on Human System**: Strong irritant of lungs and throat.
- **Internal Exposure**: Headache, dizziness, nausea, wheezing, cough.
- **External Exposure**: Severe irritation of eyes, nose, throat. Blisters on skin.
- **Type of Pesticide**: Fumigants.

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**CHEMICAL FAMILY: METHYL BROMIDE, ETHYLENE OXIDE AND PROPYLENE OXIDE**

- **Action on Human System**: Serious injury to lungs; injures nervous system.
- **Internal Exposure**: Coughing of frothy fluid; severe shortness of breath, drowsiness, shaking, weakness.
- **External Exposure**: Irritates eyes, nose, and throat.
- **Chronic Exposure**: Lack of coordination.
- **Type of Pesticide**: Fumigants.

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**CHEMICAL FAMILY: HALOCARBONS**

- **Action on Human System**: Injures heart muscles; also injures lungs, brain, liver, and kidney.
- **Internal Exposure**: Shock, drowsiness, shaking, weakness.
- **External Exposure**: Irritates eyes, nose, and throat. Blisters and redness on skin.
- **Chronic Exposure**: Liver damage, weight loss, and jaundice.
- **Type of Pesticide**: Fumigants.

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**CHEMICAL FAMILY: HYDROGEN CYANIDE ACRYLONITRILE, AND SODIUM CYANIDE**

- **Action on Human System**: Injury to brain and heart tissues.
- **Internal Exposure**: Headache, nausea, constriction of throat, dizziness, nervousness. Sudden unconsciousness.
- **External Exposure**: Irritant.
- **Type of Pesticide**: Fumigants, rodenticides.

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**CHEMICAL FAMILY: 4-AMINO-PYRIDINE PYRIDINE**

- **Action on Human System**: Disrupts nervous system functions.
- **Internal Exposure**: Thirst, nausea, dizziness, weakness, excessive sweating.
- **Type of Pesticide**: Avicides.

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**CHEMICAL FAMILY: CHLORDIMEFORM**
• **Action on Human System:** Bladder injury.
• **Internal Exposure:** Abdominal and back pain; painful urination; blood in urine.
• **External Exposure:** Skin rash; sweet taste in mouth.
• **Type of Pesticide:** Insecticides, miticides.

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**CHEMICAL FAMILY: COPPER SALTS AND ORGANIC COMPLEXES**

• **Action on Human System:** Injured intestinal lining, brain, liver, kidneys, and blood.
• **Internal Exposure:** Prompt vomiting; burning pain in chest; diarrhea, headache, sweating.
• **External Exposure:** Irritates skin and eyes; damages mucous membranes.
• **Type of Pesticide:** Fungicides.

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**CHEMICAL FAMILY: CYCLOHEXIMIDE**

• **Action on Human System:** Irritates stomach and intestine; injury to kidneys, brain lining, and nervous system.
• **Internal exposure:** Excitement, tremors, salivation, diarrhea.
• **External Exposure:** Minimal
• **Type of Pesticide:** Fungicides.

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**CHEMICAL FAMILY: ENDOThALL**

• **Action on Human System:** Damages heart, blood vessels, nervous system, and intestinal lining.
• **Internal Exposure:** Convulsions, shock, lack of coordination.
• **External Exposure:** Irritating to eyes, skin, and mucous membranes.
• **Type of Pesticide:** Herbicides, algicides.

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**CHEMICAL FAMILY: NICOTINE SULFATE**

• **Action on Human System:** Injures nervous system.
• **Internal Exposure:** Nausea, headache, diarrhea, dizziness, shaking, abdominal pain, lack of coordination, sweating, salivation.
• **External Exposure:** Minimal but readily absorbed through the skin.
• **Type of Pesticide:** Insecticides.

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**CHEMICAL FAMILY: ACETAMIDES**

• **Action on Human System:** Irritants.
• **External Exposure:** Moderately irritating to skin and eyes.
• **Type of Pesticide:** Herbicides.
CHEMICAL FAMILY: ACETANILIDES

- **Action on Human System:** Irritants.
- **External Exposure:** Mild irritants; propachlor is a skin irritant and sensitizer.
- **Type of Pesticide:** Herbicides.

CHEMICAL FAMILY: Aliphatic Acids

- **Action on Human System:** Irritant
- **External Exposure:** Skin and eye irritants.
- **Type of Pesticide:** Herbicides.

CHEMICAL FAMILY: Benzonitriles LES

- **Action on Human System:** Irritant
- **Internal Exposure:** Moderately irritating to lungs.
- **External Exposure:** Moderately irritating to skin.
- **Type of Pesticide:** Fungicides, herbicides.

CHEMICAL FAMILY: Carbamates

- **Action on Human System:** Do not inhibit cholinesterase; mild irritants.
- **External Exposure:** Mild irritant to skin, eyes, nose, and throat.
- **Type of Pesticide:** Herbicides, fungicides.

CHEMICAL FAMILY: Carbamates

- **Action on Human System:** Irritant.
- **External Exposure:** Irritant and skin sensitizer.
- **Type of Pesticide:** Herbicides.

CHEMICAL FAMILY: Dicarboximides

- **Action on Human System:** Irritant.
- **External exposure:** Skin irritant.
- **Type of Pesticide:** Fungicides.
CHEMICAL FAMILY: DINITROTOLUOIDINE COMPOUNDS

- **Action on Human System:** Irritant.
- **External Exposure:** Slightly to moderately irritating to skin, eyes, nose, and throat.
- **Type of Pesticide:** Herbicides.

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CHEMICAL FAMILY: OXADIAZOLINONE

- **Action on Human System:** Irritant.
- **External Exposure:** Irritating to skin and eyes.
- **Type of Pesticide:** Herbicides.

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CHEMICAL FAMILY: PHTHALATE

- **Action on Human System:** Irritant.
- **External Exposure:** Mild irritant.
- **Type of Pesticide:** Herbicides.

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CHEMICAL FAMILY: PYRIDAZINONE

- **Action on Human System:** Irritant.
- **External Exposure:** Slightly irritating.
- **Type of Pesticide:** Growth Retardant.

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CHEMICAL FAMILY: PHOSPHONOMETHYL GLYCINE

- **Action on Human System:** Irritant.
- **Internal Exposure:** Irritates lungs.
- **External Exposure:** Irritates eyes.
- **Type of Pesticide:** Herbicide.

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CHEMICAL FAMILY: THIADIAZIN(OL)

- **Action on Human System:** Irritant.
- **Internal Exposure:** Vomiting, diarrhea, shaking, and weakness caused by bentazon herbicides.
- **External Exposure:** Moderately irritating to skin, eyes, nose, and throat.
- **Type of Pesticide:** Herbicides, fungicides.
CHEMICAL FAMILY: TRIAZINES

- **Action on Human System:** Irritant.
- **External Exposure:** Mildly irritating to skin, eyes, nose, and throat.
- **Type of Pesticide:** Herbicides.

CHEMICAL FAMILY: URACILS

- **Action on Human System:** Irritant.
- **Internal Exposure:** Irritating to lungs.
- **External Exposure:** Irritating to skin, eyes, nose, and throat.
- **Type of Pesticide:** Herbicides.

CHEMICAL FAMILY: UREA DERIVATIVES

- **Action on Human System:** Irritant.
- **External Exposure:** Moderately irritating to skin, eyes, nose, and throat.
- **Type of Pesticide:** Herbicides, insecticides.

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For more information relative to pesticides and their use, please contact the PMEP staff at:

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