



United States Army Training Center Public Affairs Fort Jackson, South Carolina 29207



High Melting Explosive (HMX) FACT SHEET

What is HMX?

HMX stands for High Melting Explosive. HMX is a man-made chemical that does not occur naturally in the environment. It is produced at military arsenals and is used as an explosive in military munitions. HMX may be found mixed with other explosives, specifically trinitrotoluene (TNT) and Royal Demolition Explosive (RDX). Historically, HMX has been used in artillery shells and mortars, mixed with RDX and TNT.

How might I be exposed to HMX?

HMX can enter the body through inhalation of contaminated dust or soil, absorption of contaminated water through the skin, or ingestion of contaminated water through drinking or using it for food preparation. Ingesting contaminated water would most likely introduce a higher amount of HMX into the body than through inhalation or absorption through the skin. Even then, HMX is poorly absorbed by the gastrointestinal tract.

NOTE: The U.S. Environmental Protection Agency (EPA) has set a Lifetime Health Advisory level of 400 parts per billion (ppb) for HMX. [1 ppb = 1 microgram/liter (ug/L)]. EPA defines the lifetime health risk advisory level as the concentration in drinking water that is not expected to cause any non-carcinogenic adverse health effects over a lifetime of exposure. Although the amounts of HMX detected in private well water samples taken to date are well below the amount expected to cause any negative health effects, the U.S. Army is committed to conducting a thorough assessment to protect the health of our Fort Jackson community members.

How may HMX affect my health?

There is very little information available about the potential negative health effects of HMX on humans. In one human study, no negative health effects were reported in workers who breathed HMX. However, the concentrations of HMX in the workplace air were not reported and the study was limited to a small number of workers. Studies in rats, mice, and rabbits indicate that HMX is poorly absorbed by the body following oral exposure, but may be harmful to the liver and the central nervous system if it is swallowed in very high doses. Studies done in animals suggest HMX is a mild skin irritant, but it is unlikely to cause any allergic reactions from skin contact and it is not irritating to the eyes. Currently there is no information available about whether or not HMX can negatively affect the ability to have children or cause birth defects. The EPA Lifetime Health Advisory level of 400 ppb was set as a protective measure in an abundance of caution since very little study of this explosive has been conducted, even though there are no known negative health effects to humans from exposure to HMX.

Will exposure to HMX cause cancer?

The EPA has concluded that there is not enough information to determine whether HMX is a potential human carcinogen. However, all studies to date investigating whether or not HMX has the ability to cause cell or gene mutations have been negative.

How can HMX affect children?

At this time there is no information available about potential negative health effects of HMX specific to children as there have been no known studies of children exposed to HMX. We do not know whether children are more susceptible to the effects of HMX than adults or whether HMX causes birth defects in humans.

I (my spouse, my child) have/has/had (insert medical condition or disease here). Could exposure to HMX have caused this?

At this time, we do not know what, if any, negative health effects humans might experience from exposure to HMX. Negative health effects related to HMX exposure would not be expected at the residences where private well samples indicated its presence because HMX was detected in amounts so far below the EPA Lifetime Health Advisory level. However, if you have any health concerns you are encouraged to discuss those concerns with your private physician. Most diseases and medical conditions do not have one cause, but result from multiple contributing factors. Therefore, your private physician is the best person to determine your personal risk factors, if any, for your medical condition.

How can I reduce my risk of exposure to HMX?

In homes where tap or well water has tested positive for the presence of HMX, exposure can be reduced by drinking and cooking with bottled water. Negative health effects would not be expected from bathing in water with low levels of HMX.

References:

1. ATSDR. 1997. Toxicological profile for HMX. Agency for Toxic Substances and Disease Registry. US Department of Health and Human Services, Public Health Service, Atlanta, GA.
2. Drinking Water Health Advisory: Munitions, edited by W.C Roberts and W.R. Heatley , 1992. US Environmental Protection Agency Office of Drinking Water Health– Advisories.
3. Dr. Mark Johnson and Dr. Larry Williams, U.S. Army Public Health Command (USAPHC) Toxicology