



QUESTIONS AND ANSWERS: MEN'S REPRODUCTIVE HEALTH STUDY DRINKING WATER CONTAMINANTS AND SEMEN QUALITY

October 2003

In 2003, the California Department of Health Services (CDHS) completed a study that looked at the relationship between semen quality and chemicals in drinking water. This study, called the Men's Reproductive Health Study, was done in partnership with the U.S. Environmental Protection Agency (EPA). Researchers looked at the amount of trihalomethanes (THMs) in drinking water in relation to the quality of semen. Semen quality is measured by count, concentration, movement, and shape of the sperm. This fact sheet was created to answer questions you might have about this study.

Where does my drinking water come from?

Drinking water comes from both "surface water" sources (such as lakes, rivers, and reservoirs) and "ground water" sources (water pumped from wells). Most people's water is a combination of surface and ground water. All surface waters and many ground waters must be disinfected by water companies to remove bacteria and other germs. Chlorination is the most common way to disinfect drinking water. Because water comes from different sources, some water companies need to use more chlorine to disinfect their water than others.

What are THMs?

THMs are a group of chemicals that are created when water is chlorinated. When drinking water is disinfected with chlorine, over time the chlorine mixes with organic matter in the water (such as leaf debris) and creates other chemicals called "by-products." THMs are one of the by-products of chlorinating water. There are four different trihalomethanes: bromoform, chloroform, bromodichloromethane, and chlorodibromomethane. Together they are called "total trihalomethanes" or TTHMs. The amount of TTHMs in drinking water can change over time, depending on the season, water temperature, amount of chlorine needed to disinfect the water, and other factors.

How was the study done?

CDHS enrolled 157 men in this study. The men were the husbands of women who participated in a companion study of TTHMs and menstrual cycles¹. Between May 1990 and June 1991, the men completed an interview, which included questions on how much tap water they drank at home and provided two semen samples. During this time, CDHS collected information on the level of TTHMs in the water that the men drank at home. Researchers then examined the quality of the men's semen in relation to the estimated amount of TTHMs they had consumed.

What did the study find?

The amount of TTHMs in water did not lower the men's sperm count or concentration. However, men who were exposed to higher levels of TTHMs had a slightly greater number of abnormally shaped sperm in one test. This increase was not as obvious when the sperm was studied using a different method. Researchers also saw a slight change in the movement of sperm from men who were exposed to higher amounts of the THM, *bromodichloromethane* (BDCM). The sperm from men with higher levels of BDCM tended to have slightly more side-to-side motion, and slightly less forward motion.

Because this is the first study of TTHMs and semen quality that has been conducted, further study is needed. Other by-products of chlorination may also have been responsible for the changes we saw in the men's semen.

What does this mean for me?

If you drink a lot of water with moderate or high levels of TTHMs, your semen quality may be affected. CDHS does not believe that the very small changes we saw are harmful, or will lower men's ability to have children. While some investigations have found that decreased movement and an increase in abnormally shaped sperm can decrease fer-

¹ Information on the Women's Reproductive Health Study can be found on the internet at: <http://www.dhs.ca.gov/ehib>

tility, it is important to remember that the change in sperm quality in those other studies was much greater than what we saw in our study. CDHS and other groups are continuing to investigate the possible health effects of TTHMs in drinking water.

What can I do to protect my health?

Drinking water is an important part of a healthy diet. Drinking water helps the heart, kidneys, and other organs function properly. Adults should consume at least eight glasses of water a day. Keep in mind that you don't have to limit yourself to water. You can drink fruit juice, decaffeinated tea, sparkling water, sports drinks, or other liquids. All of these liquids count toward your eight glasses of water a day.

Information about TTHM levels in your water is sent to you every year by your water utility. It is also available upon request. If your drinking water has high levels of TTHMs and you are concerned, you can protect your health by using a home water filtration system that has been certified by the state of California. Letting water sit in a pitcher overnight or boiling water for one or two minutes before drinking it may also lower the levels of TTHMs in your water. If you are worried about your health, CDHS recommends that you talk to your health care provider.

What is being done to prevent the risks from THMs?

The EPA regulates the amount of TTHMs allowed in drinking water. Federal TTHM standards have been in place since 1979. EPA has a stage-by-stage plan for reducing the amount of TTHMs and other contaminants in drinking water, at the same time making sure that bacteria and other germs are removed so the water is safe to drink. The current rule requires water utility companies to test their water every few months. The rule sets the maximum level for the utility to a yearly average of 80 parts per billion (ppb). Large water utilities serving at least 10,000 people, have been following that rule since 2002, and smaller water utilities will have to follow the rule by the end of 2004. A new

rule will be proposed by EPA later this year to regulate the yearly average TTHMs at each test location at 80 ppb instead of looking at the average of all measurements for the water utility. The new rule also makes sure that test sites include locations known to have the highest TTHM levels, so the rule should further reduce the levels of TTHMs allowed in home tap water.

Where can I get more information about this study?

For information about the Men's Reproductive Health Study contact:

California Department of Health Services
Environmental Health Investigations Branch
1515 Clay St., Suite 1700
Oakland, CA 94612
(510) 622-4500

You can find additional information about the Environmental Health Investigations Branch online at:

<http://www.dhs.ca.gov/ehib>

The full study (Trihalomethane Levels in Home Tap Water and Semen Quality. Fenster L, Waller K, Windham GC, Henneman T, Anderson M, Mendola P, Overstreet JW, Swan SH) can be found in *Epidemiology*, 2003; in press.

For information about THMs regulation, call the EPA Safe Drinking Water hotline at (800) 426-4791.

For information about your drinking water in California, contact your local utility or:

California Department of Health Services
Division of Drinking Water and
Environmental Management
(916) 322-2308

Information about which home water filtration systems have been certified by the State of California, a full list can be found on the Internet at:

<http://www.dhs.ca.gov/ps/ddwem/technical/certification/device/table.htm>