

# N-Nitrosodimethylamine (NDMA) - ToxFAQs™

## What is NDMA?

N-Nitrosodimethylamine (NDMA) is a chemical that is made by industry and by natural processes. At room temperature, it is a yellow liquid with no distinct odor. NDMA is currently made in small amounts for research purposes only. This chemical may also be unintentionally produced by chemical reactions involving other chemicals. For example, NDMA may be inadvertently formed in wastewater and drinking water supplies during the disinfection process. Finally, NDMA is made naturally in your body at low levels from chemicals found in your body and in the food you eat.



Prior to 1976, NDMA was used to make rocket fuel, but this use was stopped after high levels were found in the environment around a manufacturing plant. NDMA can be formed when certain chemicals come in contact with each other. These chemicals can be found in some industries including tanneries, pesticide manufacturing plants, rubber and tire manufacturers, chemical manufacture/use sites, fish processing industries, foundries, and dye manufacturers.

## What happens to NDMA in the environment?

NDMA is not expected to stay in the environment long. In the air, sunlight will rapidly break this chemical down (half will be removed in 5–30 minutes). In water, NDMA does not evaporate into the air, but will get broken down by sunlight and by other natural biological processes. NDMA can move through the soil and may enter groundwater. It is not thought to build up in animals.

## How can I be exposed to NDMA?

Your body makes low levels of NDMA from chemicals that are found naturally in foods. You may have more exposure if you eat certain foods that contain alkylamines (such as cured meats, fish, and cheese), which can cause NDMA to form in the stomach; drink water containing NDMA, or drink malted beverages (such as beer and whiskey). Bathing, showering, or swimming in water that contains NDMA will expose you to this chemical. Breathing in cigarette smoke and, to a lesser extent, using certain toiletry and cosmetic products such as shampoos and cleansers, rubber products, or pesticides that contain NDMA may expose you to this chemical.

If you work in certain industries such as tanneries, pesticide or dye manufacturing, fish processing industries, foundries, or rubber and tire plants, you may be exposed to NDMA.

## How can NDMA affect my health?

Health effects from NDMA exposure are not fully studied. When people were exposed to very high levels of NDMA, liver damage occurred.

Liver effects have also been seen in animals that ate food or drank water containing high levels of NDMA for both short and long periods of time. Rats and mice that were fed NDMA during pregnancy had offspring that were born dead or died shortly after birth.

**NDMA can be made inadvertently from natural chemical reactions. It can cause liver damage and it is classified as reasonably anticipated to be a human carcinogen.**

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## Can NDMA cause cancer?

Some studies show that workers exposed to NDMA may have a greater chance of developing liver, stomach, bladder, and prostate cancer. Ingesting high levels of NDMA may lead to stomach and colorectal cancer.

Animals that ate NDMA developed liver, lung, kidney, and testicular cancers.

The [U.S. Department of Health and Human Services \(DHHS\)](#) has classified NDMA as reasonably anticipated to be a human carcinogen.

The [U.S. Environmental Protection Agency \(EPA\)](#) has categorized NDMA as a probable human carcinogen (Group 2B).

The [International Agency for Research on Cancer \(IARC\)](#) has classified NDMA as probably carcinogenic to humans (Group 2A).

## Can I get a medical test to check for NDMA?

There are tests that can measure NDMA in the urine. These tests need to be done soon after exposure occurred. They cannot predict if you will experience any health effects.

## How can I protect myself and my family from NDMA?

Avoid smoking or coming in contact with secondhand smoke. Limit your consumption of foods containing high levels of nitrites or nitrates. Stay informed about medications that may contain NDMA or related chemicals by visiting the U.S. Food and Drug Administration website (<https://www.fda.gov/drugs/drug-safety-and-availability/information-about-nitrosamine-impurities-medications>).

## For more information:

Call **CDC-INFO** at 1-800-232-4636, or submit your question online at

<https://wwwn.cdc.gov/dcs/ContactUs/Form>

Go to ATSDR's Toxicological Profile for N-Nitrosodimethylamine (NDMA):

<https://wwwn.cdc.gov/TSP/ToxProfiles/ToxProfiles.aspx?id=884&tid=173>

Go to ATSDR's Toxic Substances Portal: <https://wwwn.cdc.gov/TSP/index.aspx>

Find & contact your ATSDR Regional Representative at [http://www.atsdr.cdc.gov/DRO/dro\\_org.html](http://www.atsdr.cdc.gov/DRO/dro_org.html)

