

Hydrogen Sulfide (H₂S) Health Hazards

Hydrogen sulfide is a colorless, flammable, extremely hazardous gas with a “rotten egg” smell. It is produced by the breakdown of animal wastes or manure. It is heavier than air and can collect in low-lying and enclosed, poorly ventilated areas such as reception pits, ditches, or manholes.

Concentration (ppm)	Short Term Symptoms/Effects
0.00011-0.00033	Typical background concentrations
0.01-1.5	Odor threshold (when rotten egg smell is first noticeable to some). Odor becomes more offensive at 3-5 ppm. Above 30 ppm, odor described as sweet or sickeningly sweet.
2-5	Prolonged exposure may cause nausea, tearing of the eyes, headaches or loss of sleep. Airway problems (bronchial constriction) in some asthma patients.
20	Possible fatigue, loss of appetite, headache, irritability, poor memory, dizziness.
50-100	Slight conjunctivitis (eye irritation and redness). Respiratory tract irritation after 1 hour. May cause digestive upset and loss of appetite.
100	IDLH – Immediately Dangerous to Life and Health Leave area and get to your safety zone Coughing, eye irritation, loss of sense of smell Altered breathing, drowsiness after 15-30 minutes Throat irritation after 1 hour Gradual increase in severity of symptoms over several hours. Death may occur after 48 hours.
200-300	Marked conjunctivitis and respiratory tract irritation after 1 hour. Pulmonary edema (fluids in lungs) may occur from prolonged exposure.
500-700	Staggering, collapse in 5 minutes. Serious damage to the eyes in 30 minutes. Death after 30-60 minutes.
700-1000	Rapid unconsciousness, "knockdown" or immediate collapse within 1 to 2 breaths, breathing stops. Death within minutes.
1000-2000	Nearly instant death

What about longer term health effects? Some people who breathed in levels of hydrogen sulfide high enough to become unconscious continue to have headaches and poor attention span, memory, and motor function after waking up. Problems with the cardiovascular system have also been reported at exposures above permissible exposure limits. People who have asthma may be more sensitive to hydrogen sulfide exposure. That is, they may have difficulty breathing at levels lower than people without asthma.

Source: <https://www.osha.gov/SLTC/hydrogensulfide/hazards.html> Accessed. November 2, 2016.



For further information on Manure Gas Safety, visit <http://fyi.uwex.edu/agsafety>.

Information provided by **UW- Madison/Extension Center for Agricultural Safety and Health**,
460 Henry Mall, Madison WI 53706.



**Biological Systems
Engineering**
UNIVERSITY OF WISCONSIN-MADISON