

Lee County Health Department

Environmental Health Services

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NITRATES

Serious and occasionally fatal poisonings of infants have occurred following ingestion of water containing concentrations of nitrate which are greater than 10 mg/l. Nitrate is converted to nitrite in the stomach of an infant. In turn, the nitrite converts the hemoglobin of the blood to methemoglobin. The methemoglobin cannot transport oxygen and the infant, in effect, suffocates. The infant develops a "bluish" color from lack of oxygen, and the syndrome is frequently called "blue baby disease".

Usually, an infant is susceptible until about three months of age. The fluid intake of an infant, per body weight, is approximately three times that of an adult. The infant's incompletely developed capability to secrete gastric acid allows the gastric pH to become high enough to allow the nitrate-reducing bacteria to reside in the gastrointestinal tract. Also, the hemoglobin of the infant, hemoglobin F, is more susceptible to the formation of methemoglobin than is the adult form, hemoglobin A. Finally, the enzyme responsible for normal methemoglobin reduction is less active in the infant. Little is known, however, why some infants are far more susceptible than others. If an affected infant receives prompt treatment, the symptoms are readily reversible and no apparent permanent damage occurs.