In this review, we present an update on maternal exposure to nitrates in drinking water in relation to possible adverse reproductive and developmental effects, and discuss nitrates in drinking water in the United States. The current standard for nitrates in drinking water is based on retrospective studies and approximates a level that protects infants from methemoglobinemia, but no safety factor is built into the standard. The current standard applies only to public water systems. Animal studies have found adverse reproductive effects resulting from higher doses of nitrate or nitrite. The epidemiologic evidence of a direct exposure-response relationship between drinking water nitrate level and adverse reproductive effect is still not clear. However, some reports have suggested an association between exposure to nitrates in drinking water and spontaneous abortions, intrauterine growth restriction, and various birth defects. Uncertainties in epidemiologic studies include the lack of individual exposure assessment that would rule out confounding of the exposure with some other cause. We conclude that the current literature does not provide sufficient evidence of a causal relationship between exposure to nitrates in drinking water and adverse reproductive effects.