

## **Nitrate in groundwater and excretion of nitrate and nitrosamines in urine: a review**

### **Abstract**

Nitrate is harmful to humans as it can form endogenous nitrosamines which can cause cancer. The major contribution of nitrate contamination in well water is largely from agricultural activities (e.g.; fertilizers and pesticide), wastewater treatment plant discharge, animal yard and manure storage lagoons. Biomarkers such as urine and saliva can be used to determine the occurrence and formation of nitrosamines in the human body. This paper provides an overview of nitrate occurrence in groundwater and the mechanism of nitrosamines formation and its excretion from human body via urine and saliva. The suitability of urine and saliva as biomarkers of endogenous nitrosamines formation were also discussed in this review.

**Keyword:** Groundwater; Nitrate; Nitrosamines; Urine; Saliva