



New Zealand College of Midwives

TE KĀRETI O NGA KAIWHAKAWHANAU KI AOTEAROA

Member advisory: 27th May 2021

Nitrate levels in drinking water: risks for pregnant women and formula-fed babies

Through land uses such as farming and sewage disposal systems, nitrate, a highly soluble compound, is released into the soil and easily transported through into groundwater.

Exposure to high nitrate levels in drinking water may prevent the blood from delivering oxygen throughout the body. High nitrates in drinking water have been associated with methaemoglobinaemia (blue baby syndrome) in infants who are formula fed and two recent international studies published in 2021 have also linked antenatal nitrate exposure in pregnant women to low birth weight (1) and preterm birth (2).

Currently, New Zealand Drinking Water Standards give a Maximum Acceptable Value (MAV) of 50mg/L for nitrate, which is equivalent to 11.3mg/L nitrate-N. This MAV is based on reducing the risk of methaemoglobinaemia (blue baby syndrome). However the two recent international studies have linked nitrate exposure above 5 mg/L during pregnancy to pre-term birth (20-31 weeks) and low birth weight. This finding is consistent with other studies looking at preterm and low birth weights (3-7).

[Nitrate contamination in drinking water and adverse birth outcomes: emerging evidence is concerning for NZ – Public Health Expert, University of Otago, New Zealand](#)

Nitrate levels do vary over the year. They are often highest in spring, and in areas where there is extensive irrigation, high nitrate levels can be found in late summer.

Advice

- Public / council-managed water supplies in New Zealand are monitored for nitrate levels and are generally considered safe to drink.
- Women and families who have a private water supply, such as drinking-well water should have their water regularly tested for nitrate levels. Regional councils may publish information which identify rural areas where nitrate levels in drinking water may be a concern.
- It is important to use a laboratory that has been approved by the Ministry of Health to carry out the analysis required.
- Although the current MAV for nitrates in drinking water supplies is equivalent to 11.3mg/L, it is prudent to take a precautionary approach and consider the lower threshold of 5mg/L (or lower) as safer for pregnant women.
- If drinking water exceeds this threshold, pregnant women should consider accessing an alternative water source such as bottled water, or investigate effective treatment options.

- The current recommendation is to use an alternative safe water supply (for example bottled water) to make up infant formula if the nitrate level is ≥ 11.3 mg/L
- Nitrate is difficult to remove from water. Household cartridge / carbon filters, chemical treatment and boiling will not remove nitrate. Reverse osmosis and ion exchange can remove nitrate however these are expensive options.
- Breastfed babies are exposed to nitrates in the breast milk of their mothers, but they are protected against negative effects because the predominant organism (*Lactobacillus* species) in breastfed infants' gastrointestinal tracts does not convert nitrate to nitrite. It is nitrite that combines with fetal haemoglobin to prevent oxygen binding.

Further resources

<https://www.cph.co.nz/health-risks-of-nitrates-in-drinking-water/>

<https://www.health.govt.nz/our-work/environmental-health/drinking-water>

References

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