

# Nitrate Poisoning in Dairy Cattle

Nitrate poisoning occurs when susceptible cattle are turned out onto pasture that contains high levels of nitrate. Nitrate is consumed by cattle and converted in the rumen to nitrite. Nitrite prevents the blood from carrying adequate levels of oxygen to the brain, leading to rapid deaths.

## Signs of poisoning

- Sudden death (can be large numbers very quickly)
- Staggering of cattle and muscle tremors
- Rapid, fast breathing
- Frothing at the mouth
- Bluish/brown discolouration of the mouth, eyes and vulva

## What causes high nitrate levels in pasture?

Nitrate is absorbed from the soil by plants and converted to protein for growth through the process of photosynthesis. If nitrate uptake from soil is greater than the rate of utilisation by the plant, however, levels can accumulate to dangerous levels. This may be observed in the following circumstances:

- Low sunlight levels or overcast weather
- Low moisture resulting in plant stunting
- Plant stress and loss of leaf area (insect damage/frost)
- Low temperatures
- Rapid nitrate uptake due to first rain following drought conditions

- New grasses or crops (levels reduce as the plant matures)
- Using high levels of nitrogen fertiliser later in the season
- High acidity soils, increase in soil nitrogen due to white clover, sulfur or phosphorus soil deficiencies and low molybdenum can also predispose

## Cattle risk factors

Cattle may be more susceptible to nitrate toxicity if hungry when exposed to the high risk pasture, i.e. hungry cattle are more likely to eat a large amount in a short period. Cattle who have a higher physiological demand (e.g. late stage pregnant, diseased or lactating) are also more at risk.

## Monitoring pasture nitrate levels

Affordable on-farm nitrate test kits can be purchased from Global Veterinary Services to monitor at risk pasture. Alternatively you can bring us a forage sample for us to test in house or through a laboratory.

## **FACT SHEET**

### **Additional prevention methods**

- Avoid putting hungry stock onto risk feed. You can give hay or silage prior to moving animals to prevent rapid consumption of risk feed.
- It is important to check animals for signs of toxicity 1-2 hours after putting on a new break. Make sure to check animals after each new break of the paddock!
- Feed at risk crop in the late afternoon - this will give the pasture time to reduce nitrate levels with daytime sunshine.
- Do not allow hard grazing of kale, rape or ryegrass - stems close to the soil contain the highest proportion of nitrate.

### **What to do if you suspect nitrate poisoning**

- Call Global Veterinary Services immediately and explain the situation
- Let us know how many animals are affected or showing signs of toxicity (we will likely need to bring a team to help treat and assess the mob)
- Move any animals that can walk off affected pasture
- Vets will treat the worst affected (recumbent) animals first, then move onto those less affected. The treatment is injection of methylene blue into a vein.