

## Nitrate toxicity

Drought, combined with mild winter conditions and the use of nitrogen fertiliser can produce an unusually high incidence of nitrate toxicity. Both beef and dairy cattle are involved. Nitrate toxicity effect interferes with the ability of haemoglobin in blood to carry oxygen. Symptoms range from sudden death through to increased heart and respiration rate, trembling and weakness, uncoordination, recumbancy and discoloured brown to blue mucous membranes.

Abortion can follow if the animal recovers. Clinical cases have been seen in stock grazing greenfeed oats, brassicas and ryegrass pastures.

Veterinary treatment with intravenous methylene blue will prevent fatalities if administered early. Nitrates accumulate in the stem and stalk of plants when factors interfere with normal plant processes. Stress conditions that result in the accumulation of nitrate include shading or low light intensity, detrimental weather – drought, frost, hail and low temperatures. Herbicide application and disease have a similar effect. The amount of nitrate in plant tissue will also depend on plant species, stage of maturity, part of the plant and nitrogen fertiliser application.

When a plant grows it uses stored nitrate to produce plant protein. If the plant is not growing the nitrate is not used. For a one percent decrease in nitrate concentration the biomass of the crop needs to increase by 50 percent.

To determine the nitrate level in your pasture or crop, submit a sample to your veterinarian who will send it to the laboratory for analysis and provide advice when the results are received. A grocery bag full of the plant material is all that is required, and a paper bag is preferable to plastic. A nitrate level greater than two percent is considered toxic and levels between one percent and two percent should be fed with caution.

A number of management practices can reduce the risk of livestock losses to nitrate toxicity:

- Do not allow hungry stock unlimited access to potentially toxic feed.
- Avoid overstocking suspected pastures or crops – nitrate levels are greater in the parts closest to ground level.
- Feed hay or safe pasture before allowing stock access to potentially toxic crops as this will limit the amount they can ingest.
- Frequent intake of small amounts of high nitrate feed increases the total amount of nitrate that can be consumed daily by livestock without adverse effects, and helps livestock adjust to high nitrate feeds.
- Levels are higher in young plants and decrease as the plant matures, so feeding mature pasture or crop should lessen the risk.
- Observe stock frequently when first introduced to potentially toxic feed.

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