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Introduction

Fluoride is a cumulative poison, in that the body excretes little, so slight excesses in time produce toxic symptoms in old animals. Too much too quickly, as when grazing pasture with phosphate fertiliser adhered to it, will adversely affect some animals within days and even cause deaths. On the other hand, it has been used to calm prisoners.

Animal Requirements

1 mg/kg in feed is sufficient so deficiencies are unlikely because pastures usually have more than this.

Animal Deficiencies

Unlikely.

Animal Excesses

So-called phosphate poisoning from grazing phosphate fertilised pasture before about 50 mm of rain washes it off, results mostly from the F in phosphates.

Excesses lower the animal's ability to retain phosphorus, magnesium and calcium. Calcium and Boron reduce or neutralise F effects. Symptoms include restlessness, sweating, anorexia, muscle weakness, salivation, convulsions, lameness, respiratory and cardiac failures. Teeth become mottled, stained and pitted. Bones become brittle, knee joints disintegrate, but this hardly ever happens, possibly because few cows are kept for more than ten years.

Bone levels of above 200 mg/kg can cause slow poisoning. Levels of 600 to 800 for over 18 months killed cattle in Australia.

Feeding some gypsums as a supplement and allowing animals access to fertiliser bins or dumps have adversely affected animals because of the F content. Animals with optimum mineral levels are far less inclined to lick other minerals and mostly stop doing so completely, but access to all unsafe minerals (fertilisers, some gypsums, ash, etc.) should be avoided.

High levels of F reduce the absorption of iodine.

Soil & Pasture Deficiencies

These deficiencies are highly unlikely, especially when fertilising with phosphate which usually also has F.

Soil & Pasture Excesses

Very little F is taken up by pasture, so most of it stays in the soil, but water can have more than is desirable. Above 4 mg/kg is dangerous.

Adequate lime reduces plant uptake of F.

Sources

Most phosphate fertilisers have 3 to 4% F. According to BOP Fertiliser Co in March 1991, fluorine is gassed off while making Superphosphate, captured and then reinjected into the rock, because of its acid attributes, to help acidify the phosphate. The result is that the amount of F in Superphosphate is now the same as in the rock from which it is made, although some is sold to local bodies to add to drinking water at about one part per million. Its addition is claimed to have improved New Zealand children's teeth, but comparative trials in NZ between two towns (Napier and Hastings) showed no benefit.

Reports from USA indicate that elderly people, where F is added to water, are more inclined to suffer hip fractures. The increasing number of knee and hip problems in NZ indicate to me that they are

from the large number of councils adding fluoride to their water and the use of fluoridated toothpaste.

In June 2003 pain occurred in my right knee when walking up stairs. The internet said it was possibly too much fluoride which is in Hamilton's town water which I drank a lot of, so we changed to spring water and three months later my knee got better. We're still on spring water with no knee problems, and we drink more because it is so nice.

In March 2005 I heard a few clicks in my bones and had a bone scan for osteoporosis (the figures were not good) and showed Dr Gorrington. He immediately suspected low B and tested for it. Sure enough I was very low so he put Auriel and I on boron tablets. After three months the clicking stopped and both our old age (born 1931) joint problems decreased.

We also increased magnesium consumption.

A scan in 2008 showed a big improvement compared with three years earlier.

In a town in China where most peoples' knees clicked (grated) B was low, while in another town with ample B in the water, joints didn't click.