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GUIDELINES FOR NITRATES IN FEED

Nitrate toxicity may occur in cattle if the concentration of nitrate-N (NO₃-N) in feed exceeds 2,100 mg/kg (see Nitrates in Livestock Feeding. 1988. [University](#) of Nebraska-Lincoln. G74-170). The value of 2,100 mg/kg NO₃-N applies to feed that is being consumed as the entire diet for cattle. Variation from this value is dependent on 1) individual animal tolerances of nitrate, 2) adaptation of animals to feed with high nitrates, 3) amount of nitrate in the water consumed by cattle, 4) concentration of nitrates in feed mixed with the high nitrate feed, and 5) age of animal. The producer is usually concerned with the nitrate concentration in feed being fed to pregnant cows. When cattle consume feed that is high in nitrate, the potential for abortion is greater for pregnant cows than for causing death to calves, yearlings, and feeders.

The guidelines used by American Agricultural Laboratory for using feed high in nitrates are as follows:

0 - 1500 mg/kg: Risk is low. No restrictions if fed to cattle.

1500 - 2100 mg/kg: Risk is moderate. Usually no restrictions if fed to cattle.

2100 plus mg/kg: Risk is high. Do not feed to cattle unless properly mixed with feed low in nitrate. Contact the laboratory for mixing instructions.

To eliminate possibilities of nitrate toxicity to cattle, mix a feed (such as alfalfa, silage, or grain) that has a low nitrate-N concentration with feed that has a nitrate-N concentration greater than 1500 mg/kg. The following equation can be used to calculate the quantity (or parts) of low nitrate-N feed that should be mixed with one part of high nitrate-N feed to reduce to overall nitrate-N concentration in the mixture to less than 1500 mg/kg.

$$a = \frac{b(1) + c(x)}{(x + 1)}$$

a = 1500 mg/kg NO₃-N (considered very low risk when fed to cattle)

b = NO₃-N concentration of high nitrate feed (e.g. cane, millet)

c = NO₃-N concentration of low nitrate feed (e.g. alfalfa, silage, grain)

x = Number of parts of low nitrate feed that must be mixed with 1 part of high nitrate feed to lower the overall concentration of NO₃-N in the mixture to 1500 mg/kg

EXAMPLE: Cane = 3000 mg/kg NO₃-N Alfalfa = 400 mg/kg NO₃-N

$$1500 = \frac{3000(1) + 400(x)}{(x + 1)} \quad x = 1.36 \text{ parts alfalfa}$$

Therefore, 1.36 parts of alfalfa with a nitrate-N concentration of 400 mg/kg is required to be mixed with 1 part of cane with a nitrate-N concentration of 3000 mg/kg to obtain a mixture of feed with a nitrate-N concentration of 1500 mg/kg.