

INTERPRETATION OF NITRATE VALUES IN RATIONS

Considerations taken from literature and direct experiences

Physiological average of forages (excluding extreme climatic situations)	about 50-200 mg/kg DM
Average of fodder grown in areas with high zootechnical intensity	c.ca 400-800 mg/kg DM
Values of forage grown with incorrect agronomic practices	higher than 1500 mg/kg DM

Correlation found between NITRATE contents on the TOTAL RATION and problems present in stable.

NITRATES (NO ₃) mg/kg (ppm)	PROBLEMS
50-500 (about 8000mg per head/day)	Security levels
400-1000 (about. 8000-20000mg per head/day)	Levels of attention, presence of NO ₃ higher than normal: the uneven distribution of nitrates in the field can determine a fluctuating trend in the ration with each new bale. In corn silage the variability may be lower.
1.000-2.000 (approximately 20,000-40,000 mg per head/day)	Subclinical forms identifiable in: digestive disturbances (slow rumination, dysentery), reduced production, forms of intoxication, birth problems (difficulty in feeding, slow starts, blockages), . Possible cumulative action with other causes (e.g. use of silage with high ammoniacal nitrogen, mycotoxins, rancidity, poisoning and rumen imbalances of food origin).
2.000-4.000 (about 40-80 grams per head/day)	Clinical forms of fetal toxicity, poor rumen activity with blockages, soft and indigestible faeces, mastitis, lameness
4.000-10.000 (about 80-200 grams per head/day)	Full-blown clinical forms such as abortions, abdominal pain, diarrhea, ruminal blocks
Over 10.000	Death from cyanosis

Note:

- At levels between 400 and 1000 in unifeeds, we recommend monitoring the hays present on the farm, even with semi-quantitative methods, in order to combine them to obtain the minimum quantity of administration. The distribution of nitrates in fields, and consequently in hays, is very irregular; the use of a sampler capable of sampling the successive layers of the bale is recommended, monitoring several bales (it is available in the laboratory). The correlations between the problems and the reported NO₃ contents are highly variable from herd to herd, especially in relation to the level of ingestion, the method of administration, the efficiency and speed of ruminal transit, the composition of the ration (presence of easily fermentable). A reduced ruminoactivity amplifies the problem, just as a rumen in perfect efficiency could, potentially and at medium levels of contamination, eliminate it. Great attention must be paid to the use of highly contaminated forage in dry rations/heifers where the dilution of about 50% with concentrates does not take place.
- Situations of high concentration of NO₃ are reported in forage coming from soils little or not at all fertilized with sewage/manure, as well as, sometimes, successive cuts from the same plot provide forage with concentrations that do not respond to the principle of progressive depletion of the land endowment : presumably, in these cases, the vegetative stage and the climatic trend (prolonged drought) play a major role with respect to the soil endowment.
- A contribution to the overall nitrate content can come (rarely) from the water: every 10 mg/l of NO₃ contamination of the drinking water corresponds to an increase of 50 mg/kg to be added to the unifeed (1000 mg per item/day).
Ex: if I detect a NO₃ content of 800 mg/kg in a unifeed and 50 mg/l in water, I have to count them as if I had 1050 mg/kg in the ration.