

Forage, Feed and Water Nitrate Guidelines and Dietary Limits for Cattle

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Potentially Harmful Nitrate Levels (DM Basis)

- Feed and water nitrate (NO₃) is converted to nitrite (NO₂) which interacts within cattle to affect how oxygen is transported in blood
- Individual feed nitrate (NO₃-N) levels > 1150 ppm (DM) may be harmful (Cheeke, 1991) to cattle
- If one forage tests > 1000 ppm nitrate (NO₃-N), test all feeds and water to estimate total dietary intake (Adams et al., 1992)

Potentially Harmful Nitrate Levels (DM Basis)			
	Guidelines ¹		
	Safe	Caution	Danger
Nitrate-N Content in Water	20	20 - 100	100
Nitrate-N Content in Feed/TMR	1000	1000 - 4000	4000
² Nitrate-N Content in TMR + Water	400	400 - 1700	1700

To estimate total diet nitrate (NO₃-N, ppm) content, assuming no nitrates contributed by other feeds, multiply the nitrate amount in the feedstuff by the feedstuff % of total diet ratio using the following equation (keep in mind total nitrate intake determines toxicity level; other feeds may contribute nitrates):

$$\text{Total Diet Nitrate Level} = \text{Feedstuff Nitrate Level} \times (\text{Feedstuff (lbs. DM)} / \text{Total Diet (lbs. DM)})$$

e.g. Total Diet Nitrate 120 ppm = 250 ppm (Corn Silage Nitrate level) X (25 lbs. DM Corn Silage / 50 lbs. DM Total Diet)

Disclaimer: Many factors beyond dietary nitrate content and our control affect animal performance. Rock River Laboratory cannot be held responsible in any way for any management decisions, performance or actions taken following delivery of Rock River Laboratory nitrate results.

¹Safe and Danger Guidelines for total intake determined by summarizing recommendations from the references cited below.

²Total Diet Nitrate Content Estimator Tool is available at www.rockriverlab.com.

References

Adams, R.S., T.R. McCarty, and L.J. Hutchinson. 1992. Prevention and control of nitrate toxicity in cattle. Penn St. Extension Article DAS 92-107.

Cheeke, P.R. 1991. Chapter 5: Roughages. In Applied Animal Nutrition: Feeds and Feeding.

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