

Table 5. Example of Nitrate Intake Worksheet for Ruminants

| | <i>A</i> <i>Daily</i> <i>Intake</i> <i>As Fed</i> | <i>B</i> <i>%</i> <i>Moisture</i> | <i>C</i> <i>% Dry</i> <i>Matter</i> | <i>D</i> <i>Lb DM</i> <i>Intake</i> <i>Daily</i> | <i>E</i> <i>Lb</i> <i>Feed</i> <i>Water</i> | <i>F</i> <i>Feed</i> <i>NO₃-N</i> <i>Content</i> | <i>G</i> <i>Content</i> <i>Factor</i> | <i>H</i> <i>mg of</i> <i>NO₃-N</i> <i>Intake</i> |
|---------------------------------|--|---|---|---|--|--|---|--|
| <i>Calculation:</i> | <i>Lb</i> | <i>Test</i> | <i>100-B</i> | <i>AxC/100</i> | <i>AxB/100</i> | <i>PPM</i> | <i>Given</i> | <i>DxFxG</i> |
| A. Feed Item^a | | | | | | | | |
| Corn silage | 28.6 | 65 | 35 | 10.0 | 18.5 | 1700 ^b | .454 | 7718 |
| MML haylage | 26.8 | 50 | 50 | 13.4 | 13.4 | 460 | .454 | 2798 |
| Grain mix | 20.0 | 12 | 88 | 17.6 | 2.4 | 48 | .454 | 384 |
| _____ | | | | | | | .454 | |
| _____ | | | | | | | .454 | |
| _____ | | | | | | | .454 | |
| _____ | | | | | | | .454 | |
| _____ | | | | | | | .454 | |
| _____ | | | | | | | .454 | |
| _____ | | | | | | | .454 | |
| Feed Total | | | | 41.0 | 34.3 | | | 10900 |

^aInclude expected pasture intake in all diets using such

^bAmount in a single meal must be limited due to a content of 1100 ppm or higher. See Table 4 for details.

B. Drinking water contribution (for average cow at 1300 lb BW and producing 60 lb of 3.7% milk)

| | | |
|--|------------|----------------|
| Expected total water intake ^a | <u>270</u> | (I) [60 x 4.5] |
| Feed water (Total E) | <u>34</u> | (J) |
| Drinking water (I-J) | <u>236</u> | (K) |
| Mg NO ₃ -N from drinking water: | | (L) |
| K x Water NO ₃ -N as ppm or mg/l | | |
| Example: <u>236</u> x <u>8</u> x .454 = <u>857</u> | | (L) |

C. Total mg NO₃-N intake daily (M)

Total H + L
 Example: 10900 + 857 = 11757 (M)

D. NO₃-N content of total diet as % DM^b (N)

[(M/454,000) ÷ Total D] x 100
 Example: .0259 ÷ 41 x 100 = .063 (N)

^aSee Table 7 for expected water intakes.

^bSee Table 8 and the text for interpretation

(continued on next page)

Table 5. Example of Nitrate Intake Worksheet for Ruminants (continued)

E. Adjustment of ration to control NO₃-N content of diet^b

Desired level in TRDM, including water: _____% (P) —see Table 8 for guide

Assumed desired level in this example .05% (P)

Current content (N) .063% (Q)

Content to be reduced (R)

$$Q - P = R$$

Example: $.063 - .050 = .013\%$ (R)

Amount to be reduced (S)

$$D \times R/100 = S$$

Example: $41 \times .00013 = .00533$ (S)

Difference in content of NO₃-N of high and low forage (T)

High forage (F) - Low forage (F) / 10,000

Example: $(1700 - 460) / 10,000 = .1240$ (T)

Lb forage dry matter to be exchanged (U)

$$S \div T/100 = U$$

Example: $.00533 \div .00124 = 4.3$

New high NO₃-N forage DMI (V)

$$(Old) D - U = V$$

Example: $10 - 4.3 = 5.7$

New as fed amount of high forage

$$V \div C/100$$

Example: $5.7 \div .35 = 16.3$ for corn silage

New low NO₃-N forage DMI (W)

$$(Old) D + U = W$$

Example: $13.4 + 4.3 = 17.7$ (W)

New as fed amount of low forage

$$W \div C/100$$

Example: $17.7 \div .50 = 35.4$

Restriction on single meal dry matter intake for high NO₃-N forage^c:

Corn silage @ 1700 ppm content

Maximum intake = .67 ÷ cwt BW (X) —from Table 4

Single meal max in lb FDMI (Y)

$$\text{Max} \times \text{cwt BW} = Y$$

Example: $.67 \times 13 = 8.7$ (Y)

Comparison

Y vs V

8.7 max is larger than V (5.7) — Thus, corn silage could be fed in one meal.

If daily amount V is greater than Y, then corn silage should be fed in more than one meal.

Choose a desired risk level of NO₃-N in total ration dry matter that enables removal of silages or haylages at a rate that prevents molding and heating in the silo. When this is not feasible, it may not be possible to feed the high nitrate forage.

^aSee Table 7 for expected water intakes

^bSee Table 8 and the text for interpretation

^cSee Table 4 for possible need for maximum single meal intakes for forages containing 1100 ppm NO₃-N or higher