FEEDING DROUGHT-STRESSED SILAGE
Mitigate risk of nitrate accumulation.

SITUATION
Severe drought can cause unsafe levels of nitrates to form in corn plants, especially in the lower stalks. Although precautions during silage harvest can reduce nitrate levels, dairy producers should be cautious when feeding drought-stressed corn silage.

FACTORS TO CONSIDER
- Length of fermentation
- Nitrate concentrations
- Amount of silage in ration
- Ration management

ACTION PLAN
1. UNDERSTAND HOW NITRATES AFFECT COWS. Excessive nitrates in feed interfere with blood hemoglobin, preventing normal oxygen uptake by the blood and leading to abortions in pregnant cattle. Symptoms of severe nitrate poisoning include rapid heartbeat, low body temperature, muscular weakness, staggering gait, muscular tremors, a blue coloration of mucus membranes and potentially death. Contact your veterinarian to help diagnose nitrate toxicity.

2. ENSURE PROPER FERMENTATION. Ensiling helps reduce nitrate levels by up to 50 percent by converting nitrates to safer compounds. Adding limestone during ensiling may slow the fermentation process and reduce nitrate levels. Allow adequate time, typically six to eight weeks, for silage fermentation to ensure potential nitrates are converted into other compounds. Avoid feeding green chop silage.

3. TEST FERMENTED SILAGE FOR NITRATES. Under severe drought conditions, test all corn silage to determine nitrate concentrations. Corn silage with nitrate ion (NO₃) levels under 0.44 percent dry matter is safe to feed, whereas levels of 1.76 percent or higher are toxic. Reference the table for feeding recommendations based on nitrate concentration.

4. ADJUST RATION BASED ON TEST RESULTS. If tests show high nitrate concentrations, work with your nutritionist to alter the ration accordingly. When feeding silage with high nitrate levels, follow these guidelines:
   - Balance the ration properly.
   - Introduce silage into the ration gradually, feeding frequently in small amounts.
   - Dilute high-nitrate corn silage with other feedstuffs. Generally, grains and legume forages are low in nitrates.
   - Increase grain processing to help metabolize the nitrates.
   - Increase vitamin A levels in the ration.
   - If possible, segregate the suspected silage in a separate bag or pile.
   - Beware the potential accumulation of deadly nitrogen oxide gas in the silo during fermentation.

Guidelines for Feeding Corn Silage Based on Nitrate Content

<table>
<thead>
<tr>
<th>% Nitrate Ion (NO₃) Dry Matter</th>
<th>Feeding Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 0.44</td>
<td>Safe</td>
</tr>
<tr>
<td>0.44 to 0.66</td>
<td>Safe for nonpregnant animals.</td>
</tr>
<tr>
<td></td>
<td>Limit to 50% of ration.</td>
</tr>
<tr>
<td>0.66 to 0.88</td>
<td>Limit to 35% to 40% of ration.</td>
</tr>
<tr>
<td>0.88 to 1.54</td>
<td>Limit to 25% of ration.</td>
</tr>
<tr>
<td>1.54 to 1.76</td>
<td>Do not feed to pregnant animals.</td>
</tr>
<tr>
<td>1.76 or more</td>
<td>Harmful to livestock. Do not feed.</td>
</tr>
</tbody>
</table>

Resource: The Ohio State University.

SUMMARY
Prolonged hot, dry weather affects more than corn silage yield. Nitrate accumulation in drought-stressed corn can send shockwaves beyond the field and into the feed bunk. Take steps to help mitigate your herd’s exposure to nitrates in corn silage. For more information, contact your local Mycogen Seeds commercial agronomist or trusted agronomic adviser.

Resources: