Corn silage and beef cattle: Frequently asked questions

Recently, we have had a revival in the use of corn silage in Alabama. Corn silage is a high-quality feed that can be used extensively in beef cattle rations. This information sheet addresses commonly asked questions related to corn silage.

**Definition**

**What is corn silage?**
Corn silage is made by harvesting, chopping, and ensiling corn. It is high in energy and digestibility. Good quality corn silage should have a light, sweet, slightly acidic smell. The color ranges from dark green to slightly brown. A dark brown color may indicate that excessive heating or improper fermentation has occurred.

**Management considerations**

**When should I harvest corn for silage?**
Corn should be harvested for silage at the full dent stage or when the milk line is about 1/3 down the kernel. At this stage, corn should be around 30 to 45% dry matter (or 70 to 85% moisture). At this point, the corn ear has begun to fill in and achieve most of its nutritional value without significant leaf and stalk loss. Harvesting earlier than this may result in less desirable fermentation characteristics.

**What is the recommendation for chopping silage for beef cattle diets?**
The minimum particle length of corn silage should be ½ to ¾ inches in length. A ½ inch length is needed to meet the effective fiber requirement in beef cattle diets. This particle size will also pack more uniformly in a silo or bunk and can be very palatable for cattle. Pack silage as uniformly as possible to prevent exposure to oxygen and decrease the opportunity for spoilage.

**Feeding recommendations**

**What is the nutritional value of corn silage?**
The nutritional value of corn silage can vary significantly. When harvested at the dent stage of maturity, corn silage may contain on average 70% moisture, 8 to 9% crude protein, and 70 to 75% TDN.

**How much corn silage can my cattle consume per day?**
The amount of corn silage an animal will consume per day is based on 1) the stage of animal production, and 2) the amount of dry matter and moisture in the feed. Cattle need to consume more of a high-moisture feed than a low-moisture feed to meet their daily dry matter requirement. A higher moisture feed contains less dry matter on a per ton basis. The following example illustrates this point:
<table>
<thead>
<tr>
<th>Feeding hay (85% DM, 15% moisture) to 500 lb stocker</th>
<th>Feeding silage (35% DM, 65% moisture) to 500 lb stocker</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.5% body weight = 12.5 lb DM needed per day</td>
<td>2.5% body weight = 12.5 lb DM needed per day</td>
</tr>
<tr>
<td>Amount to feed = 12.5 lb DM/85% DM</td>
<td>Amount to feed = 12.5 lb DM/35% DM</td>
</tr>
<tr>
<td>Amount to feed = 14 lb hay needed per day</td>
<td>Amount to feed = 35 lb silage needed per day</td>
</tr>
</tbody>
</table>

†These calculations only account for dry matter requirements per day. A forage test can accurately determine if additional supplementation is needed when using stored forages as the main source of dry matter in the diet.

Moisture can also limit intake at a certain point, but is typically not a limiting factor in corn silage-based diets. For growing rations, a good rule of thumb is that calves will consume between 5 to 7 pounds of silage per 100 pounds of body weight.

**Does corn silage mix well with other feeds?**
Yes, corn silage can be mixed with other commodity feeds, byproducts, or roughage sources to make a total mixed ration. Commonly used supplements such as soybean meal, cottonseed meal, soybean hulls, cottonseed hulls, or citrus pulp can be mixed with corn silage. Minerals such as calcium and phosphorous can also be added at the time of ensiling. Grass or legume hay can also be incorporated into rations using a vertical mixer. An example mixture may contain 60% corn silage, 30% roughage from hay or a fibrous supplement, and 10% grain.

**Are nitrates a concern with corn silage?**
Under drought or stressful environmental conditions, nitrate accumulation can occur in well-fertilized corn silage. While ensiling chopped corn may reduce some of the nitrate concentration, it is crucial to conduct a forage test to determine nitrate levels before feeding to reduce risk. In general, silages with less than 1000 ppm nitrate-N are safe to feed.

**What about molds?**
Molds indicate spoilage and often occur in silage, especially in places exposed to air. White and gray molds often pose little threat to livestock, but when found in excess, these can reduce silage consumption. Blue and green molds are related to more problematic bacterial species like *Fusarium* and *Aspergillus*. When found in excess, these can lead to significant spoilage in corn silage and may pose a health risk to cattle.

**Should I invest in silage additives?**
The main goal of silage making is to preserve as much of the nutritional value of the crop as possible. Most commercial additives simply work to preserve the value of the forage that is there. Silage additives are not a substitute for good silage management, but can be used to help achieve maximum preservation of nutrients. The decision to use additives should weigh heavily on if an increased profit can be realized when using additives. Additives can be costly, and variable results have been observed in increasing animal production from systems involving additives. Many different additives are commercially available. They can be used to reduce storage loss, enhance fermentation, improve storage life, and improve nutritional composition to an extent. Molasses is often used to preserve high-moisture legumes and grasses, but no significant advantage has been seen with adding molasses to corn silage.

Prepared by Kim Mullenix, Extension Beef Cattle Systems Specialist, Auburn University, Auburn, AL. MKM-14-5.