Focus on Forage

Wisconsin TEAM Forage

Adding Urea to Corn Silage

by Patrick Hoffman

Introduction

Urea is a manmade feed ingredient containing 46% nitrogen or 287% crude protein equivalents. Urea is a source of dietary nitrogen for use in ruminent feeds. Ingested urea is degraded to ammonia, and the ruminal bacteria incorporate the ammonia into bacterial protein. This type of protein is then digested and becomes available to the ruminant in the lower digestive tract as a source of protein.

Urea can supply nitrogen to meet the needs of rumen bacteria in a broad range of diets. Urea is fed at low levels (0–6 oz per head per day) and requires proper mixing and feed delivery. Urea can be toxic if overfed or not properly mixed in the diet. Because corn silage is low in crude protein (8%), there has been continued interest in adding urea to corn silage to increase protein content.

Should I add urea to my corn silage?

In most situations, the answer to this question is no. If desired, urea can be easily added to the diet by other methods. Urea can easily be incorporated into grain mixes or protein mixes. Total mixed ration equipment also allows incorporation of urea into diets prior to feeding.

When urea is added to corn silage, urea is automatically forced into the diet whenever corn silage is fed. Adding urea to corn silage, therefore, decreases flexibility in feed management.

At what rate is urea added to corn silage?

Feed grade urea may be added to corn silage at a rate of 8-10 lb per wet ton (35% DM). Adding 8-10 lb per wet ton of corn silage will increase the protein content of corn silage from 8% to 11-12%.

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How do I apply urea to corn silage?

In tower silos, urea should be applied at the blower, using a granular applicator. Producers will need to weigh forage boxes and record unloading times. Dividing the weight (tons) of corn silage in the forage box by the time (minutes) to unload results in an unloading rate (tons/minute). Multiplying the unloading rate by the desired urea application rate (8-10 lb/ton) results in the granular application rate for urea (lb/minute). Adjust the applicator to achieve this rate.

Urea can be spread over the top of forage loads, but this method often results in uneven distribution and is labor intensive. It is extremely difficult to add urea to bunker silos and is usually too labor intensive.

Can I use fertilizer grade urea?

No. Feed grade urea is a high quality, micro-prilled product that is compatible with other ingredients and mixing processes. Fertililzer grade urea has a larger prill size and may contain contaminants. Use only feed grade urea when mixing and feeding to animals.

What about adding a commercial urea-based silage additive to corn silage?

Commercial nutrient-based silage additives may contain urea, slow release NPN (non-protein nitrogen), and true protein sources. Other nutrients such as minerals and vitamins are also commonly added to these products. Companies offering these products usually supply applicators, making application easier. The cost per unit of degradable protein is usually higher with these products when compared to feed grade urea. If desired, similar products can be added to TMR mixers prior to feeding which increases feed management flexibility.

What else should I know about adding urea to corn silage?

- Don't add to extremely wet corn silage (<30% DM). The NPN may concentrate in seepage.
- Don't add to extremely dry corn silage (>40% DM).
- Do not feed multiple NPN sources when feeding corn silage that had urea added to it.
- Do not feed corn silage with urea to young calves (less than 400 lb).
- Do not add urea to corn stalk silage or high moisture corn.
- Make sure urea is mixed well into any feed.

Urea is not recommended unless it reduces costs, simplifies feeding, or adds needed rumen degradable protein.