

Using Urea Feeding in Dairy Animals

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Introduction

Urea has been fed in ruminant rations for more than 100 yr. Urea can be used to supplement the diet of cattle and other ruminants. It helps maximize the benefits of poor-quality grazing by optimizing digestion – particularly in the dry season. Urea can help stem weight loss through improved rumen function in cattle when grazing feed quality is poor. Its use in dairy cattle rations has fluctuated with protein and urea prices, with various values used in different formulation systems, and with mixed to negative experiences in experiments and field situations.

Synchronizing rumen N available with carbohydrate fermentation has a theoretical benefit, but a recent review found this did not occur, most likely because of N recycling and because of the adaptability of rumen microorganisms to asynchronous N and energy supply.

The objective of urea adding to feed

- Urea adding in ensiled forages has increased final N content and reduced protein degradation of the silage.
- When urea was also added to the concentrate, no negative effects were seen if total supplemental NPN was less than 20% of total dietary N. Classic ammonia toxicity from too much dietary urea being provided in a short period is most closely related to rumen pH because urea hydrolysis elevates rumen pH, which then allows more rapid absorption of the now greater levels of rumen ammonia into the blood.

Method of urea feeding in dairy animals

Urea in concentrate mixtures

Concentrate mixtures containing 12 to 20 per cent crude protein, designed for direct feeding to dairy cattle, usually contain 1.0 to 2.0 per cent urea to replace an equal amount of nitrogen from oilseed meals or protein-rich by-product feeds. These mixtures usually contain large

amounts of cereal grains or by-products rich in starch. When as much as 3 per cent urea has been incorporated into meal mixtures of cereal grains.

Urea in high-protein supplements

High protein supplements contain urea which is fed to animals so that they do not cause toxicity. Mixtures containing as much as 80 per cent or more crude protein but with a high urea content should be fed at a level not exceeding 0.3 to 0.5 kilogram daily to cattle weighing 350 kilograms or more and they should be fed along with other concentrates.

Additions to silage and hay

Urea has been added in silage and hay time of ensiling to green maize at the rate of 0.5 per cent of the weight of the fresh forage. Dairy cows consumed less silage when more than 0.5 per cent urea was added.

Precautions when using urea

- Use urea to provide no more than one-third of the total protein requirement in the ration.
 - Feed the ration at least twice daily to prevent an ammonia overload.
 - Weigh all feed components precisely and make sure the urea is mixed completely and uniformly in the ration.
- Urea may cause toxicity and even death in ruminants if it is fed inadequately mixed with other feeds or in too large a dose. The toxic signs can easily be recognized.
- Animals should never be permitted access to urea not mixed with other feeds.

Recommendations

Traditional recommendations for feeding urea to dairy cows have been excessive. More reasonable recommendations would be for not more than 1% in the concentrate, approximately 135 g/cow daily, and not more than 20% of total dietary CP coming from added urea-NPN sources Kertz (2010).

Reference

1. Kertz, A.F. (2010). Urea Feeding to Dairy Cattle: A Historical Perspective and Review. *The Professional Animal Scientist*, **26**(3), 257–272.