

## Urea in cattle feed

**CATTLE**, like other ruminants, have the ability to utilize dietary non-protein nitrogen (NPN) to meet part of their protein requirements. The rumen of cattle (the largest of the four compartments which make up the stomach) is inhabited by billions of bacteria, fungi and protozoa.

These microorganisms enable the animals to utilize dietary NPN. In the rumen, the NPN is broken down (hydrolyzed) into ammonia nitrogen. The microorganisms use this to build their own bodies, which in turn produce (synthesize) microbial protein. Eventually, the microbes pass from the rumen into the lower gastrointestinal tract, where they are digested by the host animal. When the microbial protein is digested, amino acids are

released. These are then absorbed into the bloodstream of the animal.

### Use of urea as a protein source

When using urea to replace expensive protein sources in feed formulation for cattle (or ruminants in general), the following may be used as a guide:

- Add urea at levels of about:
  - 1% of the total air-dry ration; or
  - 2%-3% of the concentrate mixture; or
  - 25% - 30% of the total dietary nitrogen.

The urea level in the concentrate mixture can be more than 3% if a palatable ingredient such as molasses is included, and if the



Fig. 1. Zebu cross cattle grazing in the Philippines

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small-scale farmers in Asia*

#### Cooperating agency for this topic:

The Philippines Recommends for Beef Cattle Production  
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amount of roughage fed with it is reduced.

- ❑ Adequate amounts of readily available carbohydrates or energy, minerals, and vitamins should be provided for proper and efficient use of urea. These are needed by microorganisms in building body protein from the NPN source.
- ❑ Molasses is a good source of both energy and minerals. Where molasses is readily available, a water-urea-molasses mixture with a maximum of 10% urea may be used as a lick, with proper precautions. To regulate the animal intake of the water-urea-molasses mixture, a rotary lick is recommended. The suggested liquid-urea mixture is as follows: 2.5 kg urea, 4.5 kg molasses, and 28 liters water.
- ❑ Crude protein supplements with urea are cheaper than those without urea.

## Precautions

Urea should be thoroughly mixed with the feed ration. There should not be any lumps of urea in the feed, since the animals may suffer from ammonia toxicity if large quantities of urea are consumed. Toxicity symptoms range from drowsiness to excessive salivation, lack of appetite, or even death. In utilizing urea as feed, strictly observe the following:

- ❑ Animals less than one year old and those that are sick should not be given the urea.
- ❑ Energy feeds must be adequate.
- ❑ Urea intake must be controlled.
- ❑ An adaptation period must be provided.

*It is quite risky to feed urea to cattle. If you use it, you should have a good understanding of its utilization and limitations.*