

Theme 2: Forage conservation

MAKING UREA/MOLASSES/MINERAL LICK (Level 2)

Topic	Training & information Content
2.1	Fodder conservation and storage
2.2	Estimating ideal time of harvesting
2.3	Guideline for silage making
2.4	Fermentation process in silage
2.5	Treatment of straw with Urea
2.6	Making of urea/molasses/mineral lick
2.7	Management of silage pit (feed out)
2.8	Estimating fodder supplies for dry season feeding & planning of feeding management



1. You will learn about (learning objectives):

- How to identify molasses urea mineral lick/block.
- How to make molasses urea mineral lick, liquid mixture and mineral block.
- Know the importance of molasses urea mineral block.



2. Introduction

- During dry seasons, the quality of available forage may not be sufficient to meet the nutritional requirements of the cow. This requires supplementation with other feed resources.
- Molasses urea mineral block (MUMBs) can be one way to supplement dairy cows on low quality forages.
- The molasses urea mineral block can be readily bought or mixed on farm using ingredients.



3. Ingredients



- Molasses is a substance which is produced as a by product when processing sugarcane or sugar beet to make sugar.



- Urea is a white crystalline solid inorganic chemical compound, widely used as a nitrogen fertilizer.



- Minerals are inorganic elements needed by the cows body to support some of its body function.

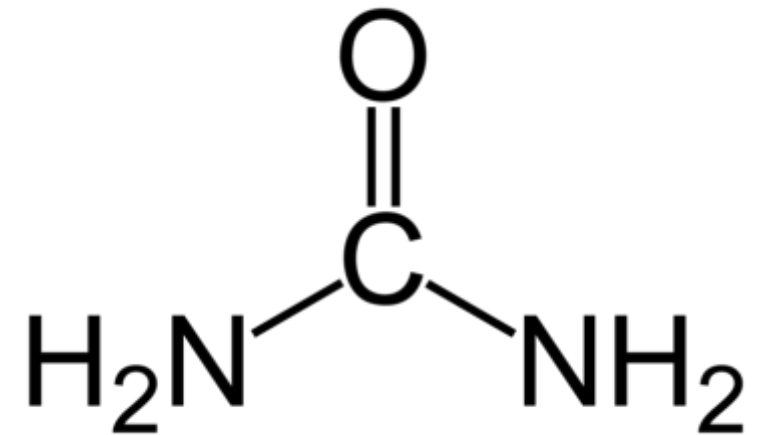


- Molasses urea mineral block (MUMBs) is a lick block with molasses, urea, minerals, vitamins and other multi-nutrients.

- MUMBs provide constant source of fermentable nitrogen to the cow throughout the day to promote growth of rumen microbes.

4. Urea

- Urea is widely used as an agricultural field fertilizer, which contains about 46% of nitrogen.
- Urea is also used as a feed supplement, as a source of non-protein-nitrogen (NPN) and has an important role in metabolism of nitrogen-containing compounds by animals.



4.1 Urea as feed ingredient for cows

- Urea can be a feed ingredient when mixed in compound feeds, total mixed rations or during ensiling processes.
- Compound feeds can be mixed with urea as an ingredient to replace, partly, protein-rich pulses or agro-industrial by products.
- For example, a compound feed containing 12-20% crude protein, may contain 1.0-2.0% urea to replace an equal (on nitrogen, N basis) amount of other protein sources.



5. Molasses

- Molasses can be fed directly to cattle or used to create molasses urea mineral blocks as an energy source cattle.
- Molasses can also be used in small quantities in compound feeds or during the ensiling process of grasses and legumes.



6. Minerals

- Minerals are found in feeds, however the amounts in the feeds are normally inadequate for high milk production and growth.
- Mineral are divided into two categories; Macro and micro minerals.
- Macro minerals are needed by cows in bigger quantities as compared to microminerals.

Further reference: See module on Mineral & vitamin requirement guidelines.



7. Mineral licks

- Mineral licks contain mineral nutrients from deposit of salts and other minerals.
- Mineral licks can be naturally occurring or artificial like salt blocks.
- Farmers can make mineral licks at the farm.



7.1 Mineral lick ingredients

- Mineral licks contain mineral and vitamins in varied quantities to meet livestock requirements.
- To make a mineral salt lick you will need:
 - 6 Kgs of mineral salt
 - 2 kgs of bonemeal
 - 1 kg of lime
 - 2 kgs of clay
 - Water
 - Bowl/tub/trough
 - Spoon for mixing
 - Wooden box



Lime
25 KG



Bone meal

7.2 Why the ingredients are used

1. Water

- Used as the main solvent to facilitate even mixing of ingredients.



2. Agricultural by-products

- Added to increase nutritive value of the block especially cereal brans.
- Microbes utilize volatile fatty acids (VFA) from carbohydrate digestion and ammonia from urea to make amino acids in the cows body.



3. Clay

- Works as a pH buffer as it helps reduce sub-clinical ruminal acidosis. It is also known to reduce aflatoxin toxicity.



4. Salt, lime/cement

- They provide macro mineral needed by the cow.
- Cement/quick lime is used as a binding agent/holds the block in shape and makes it hard for easier licking by cows.



7.3 Procedure for making mineral licks

- Pour mineral salt, bonemeal, lime and clay into a large bowl/tub.
- Mix these ingredients using a large spoon and add water while mixing until they are blended.
- The water is to help in easy blending of the ingredients.
- Once the mixture is well blended, drain off excess water by using a strain or old cloth to strain the mixture. Do this until you cannot get any more water out.
- In case the mineral mixture strained is a lot, place it in an empty bowl before transferring into a wooden box.
- Place the mixture in a wooden box and place in a cool shaded area so that it can harden.



8. Molasses urea mineral block (MUMB)

- To make a 100 kg MUMB (sufficient for 25 – 30 blocks of 3.5 - 4 kg each) you will need:
 - Molasses - 38 kg (38% as fed)
 - Urea - 12 kg (12% as fed)
 - Mineral mixture/DCP/bone meal - 2 kg (2% as fed)
 - Salt - 3 kg (3% as fed)
 - Cement - 13 kg (13% as fed)
 - Agricultural by products (wheat bran/maize bran) - 32 kg (32% as fed)
- You also need a wooden frame to shape the MUMB.
- Wooden frame dimensions are 10 cm x 20 cm x 5 cm.



8.1 Procedure for making molasses urea mineral block (MUMB)

- Pour molasses in a trough and add 1-3% water if it is too dry and mix evenly.
- Add urea and mix until it dissolves completely.
- Add mineral mixture and salt while stirring evenly.
- Add cement to the uniform mixture and mix until the paste solution is evenly mixed together.
- Finally add the agricultural by product of choice (e.g. wheat bran) and mix evenly.
- Place the evenly mixed paste into the wooden frame giving it a rectangular shape.
- Allow the block to dry in open air under a shade for 3-4 days before feeding to animals.



8.2 Feeding molasses urea mineral liquid and blocks

- Molasses urea mineral liquid/block should not be fed alone. A minimum roughage amount is needed.
- Avoid feeding urea molasses mineral liquid & block to young calves.
- Introduce the feed gradually within 1-2 weeks.
- Recommended quantities of urea molasses mixture to feed per cow per day:
 - Large cows (more than 400 Kg) - 2 kg
 - Small cows (less than 400 Kg) - 1 kgIf provided as a block, a mature dairy animal will consume (lick) up to 0.5 kg per day.



8.3 Advantages of molasses urea mineral blocks

- MUMBs;
 - i. supplements deficient nutrients in the main feed for cows.
 - ii. are easy to transport and store.
 - iii. are cost-effective
 - iv. urea molasses mineral liquid/block has reduced toxicity compared to sprinkling urea in drinking water.
 - v. increase milk productivity and reproductive efficiency in dairy cows.



9. Summary

Making molasses/urea/mineral block

Watch video:

<https://www.youtube.com/watch?v=wf0hT1SJKlO>

