

**BIHAR ANIMAL SCIENCES UNIVERSITY**

**Bihar Veterinary College, Patna**

**Department of Animal Nutrition**

**Topic: Urea Molasses Mineral Block**

**Course No. 603**

**Date:02.11.2020 Time: 2.00-4.00PM**

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# Protein metabolism in Ruminants

- Protein provide the amino acids needed for maintenance of vital functions.
- Feed Protein are degraded by microorganisms in Rumen via amino acid into ammonia ( $\text{NH}_3$ ) and branched chain fatty acids.
- The rumen microbes convert this ammonia along with a carbohydrate source ( energy source) into Microbial Protein .
- Microbial protein is further degraded down to free amino acid in small intestine.
- This amino acid is available for the use to animal .

# What are NPN Compounds ?

- Compounds supplies Nitrogen other than in form of complex molecules (protein) are called non-protein nitrogen NPN compounds.
  - Urea is the most commonly used NPN compound
  - Biuret , ammonium acetate, Glycine etc
- Ruminants have this unique ability to metabolise the dietary Nitrogen for synthesis of protein within the rumen.

# Role of NPN in Ruminants nutrition

Central component for the synthesis of protein is  $\text{NH}_3$  .

- The ammonia can be derived from metabolism of feed Protein or directly from NPN compound
- Urea is the most commonly used NPN .
- The role of urea can be best explained as follow -

# UREA



- Urea was discovered in 1773 by Rouelle and its composition was established by Prout in 1818.
- Having 46% Nitrogen.
- One kilogram of urea can furnish as much as 2.92kg of protein.
- When Urea enters the rumen it is rapidly dissolved and hydrolyzed to ammonia by bacterial urease.
- Urea urease  $\rightarrow$   $\text{NH}_3 + \text{CO}_2$

# Methods of urea feeding

## 1. Urea in concentrate mixture

- ✓ level of urea should not exceed 1% in concentrate mixture
- ✓ urea can replace 1/3rd of protein on Nitrogen basis.

## 2. Urea treatment of wheat straw

- ✓ urea treatment enhances the digestible crude protein content of wheat straw upto 3% .

## 3. Uromol

- ✓ It is prepared by boiling urea with Molasses in the ratio of 1: 3 for 30 minutes.
- ✓ It contains 36% DCP and 70% TDN .

## 4. UMMB

- ✓ UMMB stands for Urea Molasses Mineral Block .
- ✓ UMMB is a method for slow releasing urea , which checks the proper amount of urea given per day .

Ingredients	Example I (%)	Example II (%)
Molasses	45	40
Urea	15	5
Mineral mixture	15	3
Salt	8	2
Calcite powder	4	-
Bentonite	3	-
Cottonseed meal	10	-
Deoiled mahua seed cake	-	10
Wheat bran	-	20
Crushed maize	-	20

# Urea-Molasses-Wheat bran Compact Feed Block



# INGREDIENTS

- **I. Energy sources: MOLASSES**
- **II. Nitrogen Sources**
  1. Non-Protein Nitrogenous Source : **urea**
  2. Vegetable or True Protein: **Any de-oiled seed cake like Soyabean meal, mustard oil cake etc.**
- **III. Mineral Sources:**
  - 1. Common Salt
  - 2. Mineral Mixture
- **IV. Structural Components: Wheat Bran/Rice Polish**
- **V. Binder: Dolomite/ Calcite/Guar meal**



**I.      II.1.    II.2.      III.1.    III.2.    III.3.      IV.      V.**

## **TYPES OF INGREDIENTS**

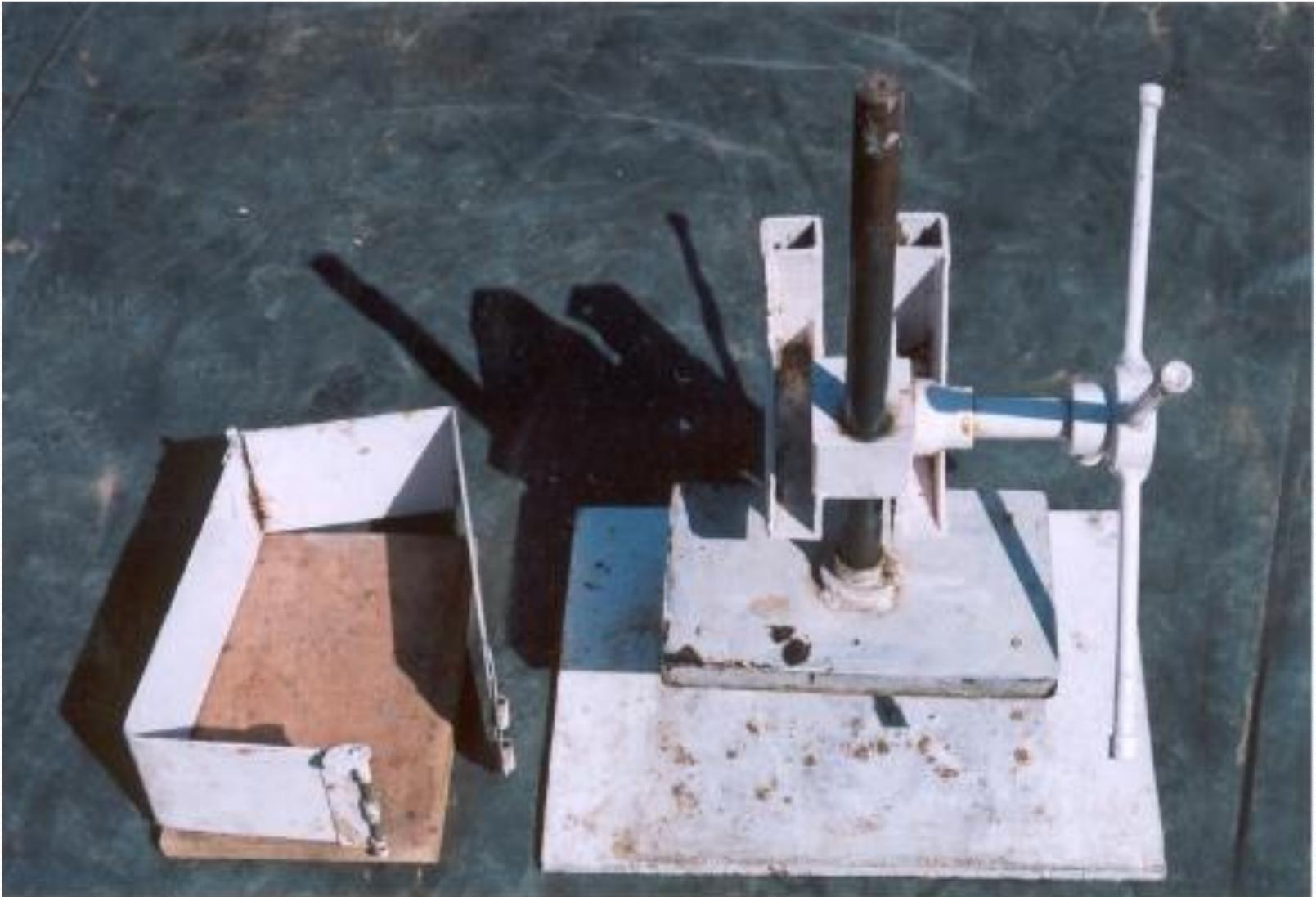
I. Energy Sources II. Nitrogen Sources: II.1. Non-Protein Nitrogenous Source II.2. Vegetable or True Protein III. Mineral Sources: III.1. Common Salt III.2. Mineral Mixture III.3. Dolomite IV. Structural Components V. Binder



## INGREDIENTS (8)

1. Molasses 2.1. Urea granules 2.2. Urea solution 3. Dolomite 4. Vitamin-mineral mixture  
5. Guar gum dust 6. Guar *churi* 7. Common salt 8. Wheat bran 3+4+7. Mixture of salts

# GADGETS AND EQUIPMENTS



# Feed-block press machines



# Collapsible Wooden-Mould for Feed-block Production



## Low Cost Solar Feed-block Dryer





# PRODUCTION PROCESS

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1. Mixing of Ingredients
2. Pressing of Ingredient Mixture
3. Drying the Pressed Material
4. Packing

# ***1. Mixing of Ingredients***



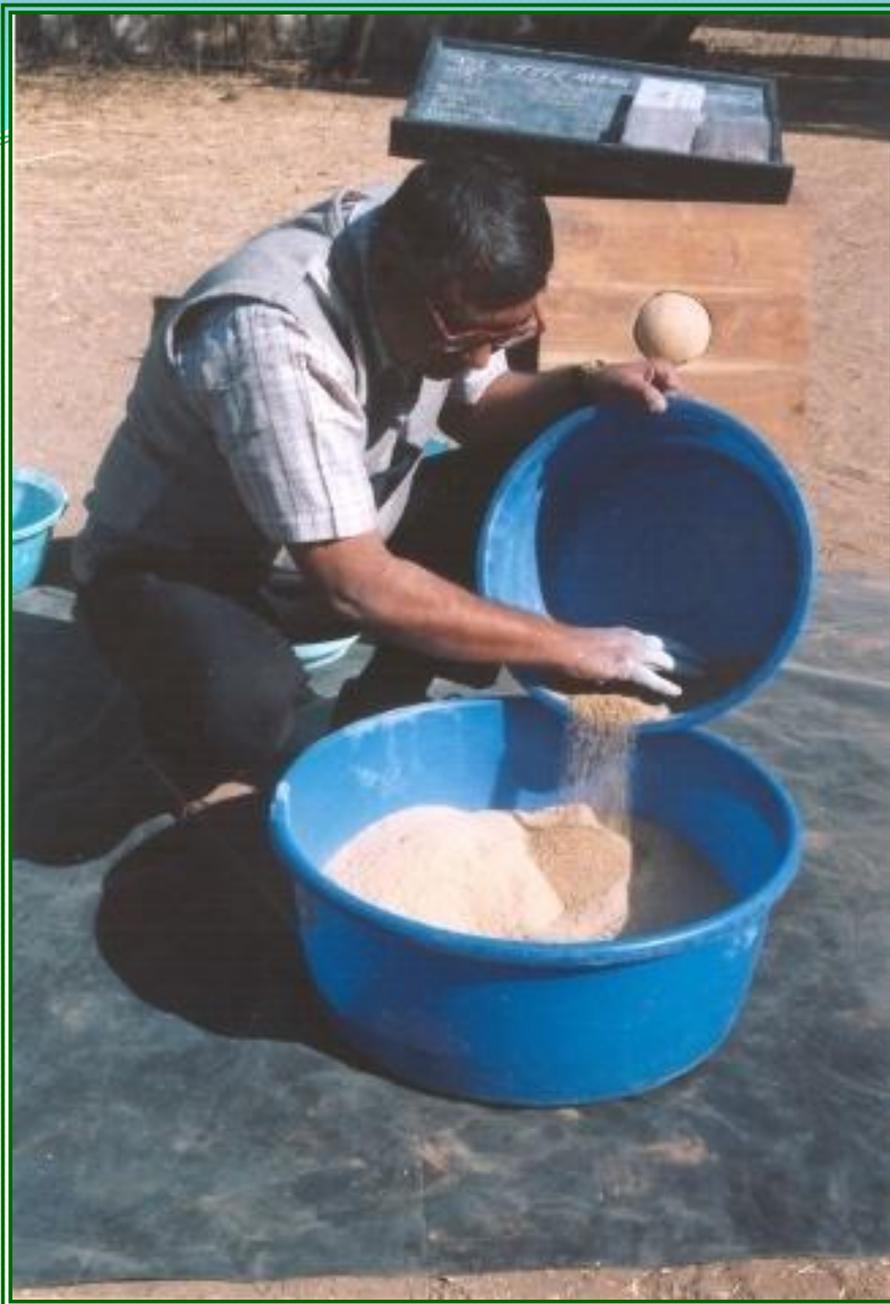
- 1. Weight 1.0 kg granular, fertilizer grade urea in glass or steel container and heat it with 500 ml (half litre) water, till it dissolves. Avoid over heating. While hot**
- 2. Pour this solution (I) into a plastic tub containing 10.400 kg molasses, and mix with steel spoon.**



**3. Prepare mixture of 1.0 kg common salt, 1.0 kg vitamin-mineral mixture, and 1.0 kg dolomitic lime or calcite.**

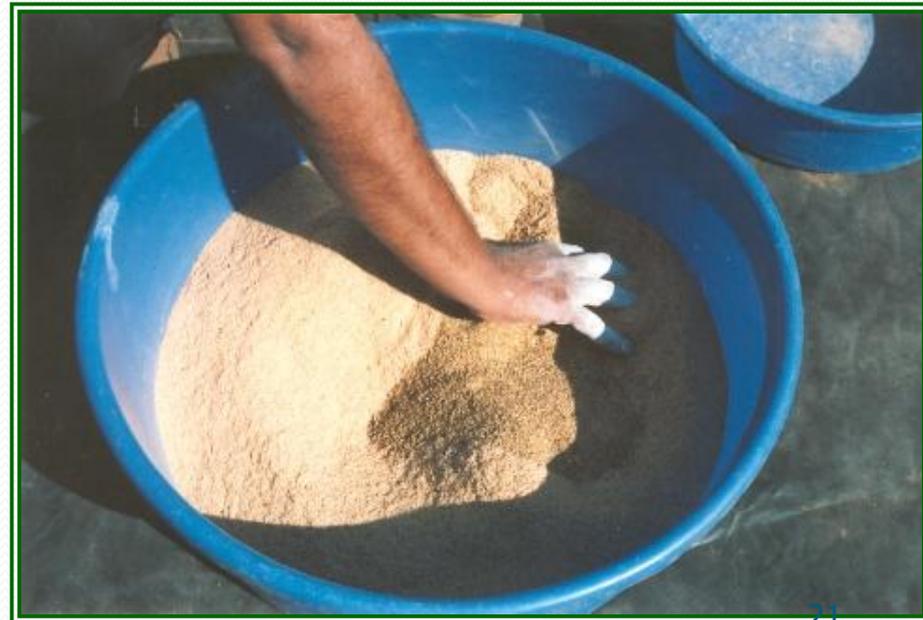


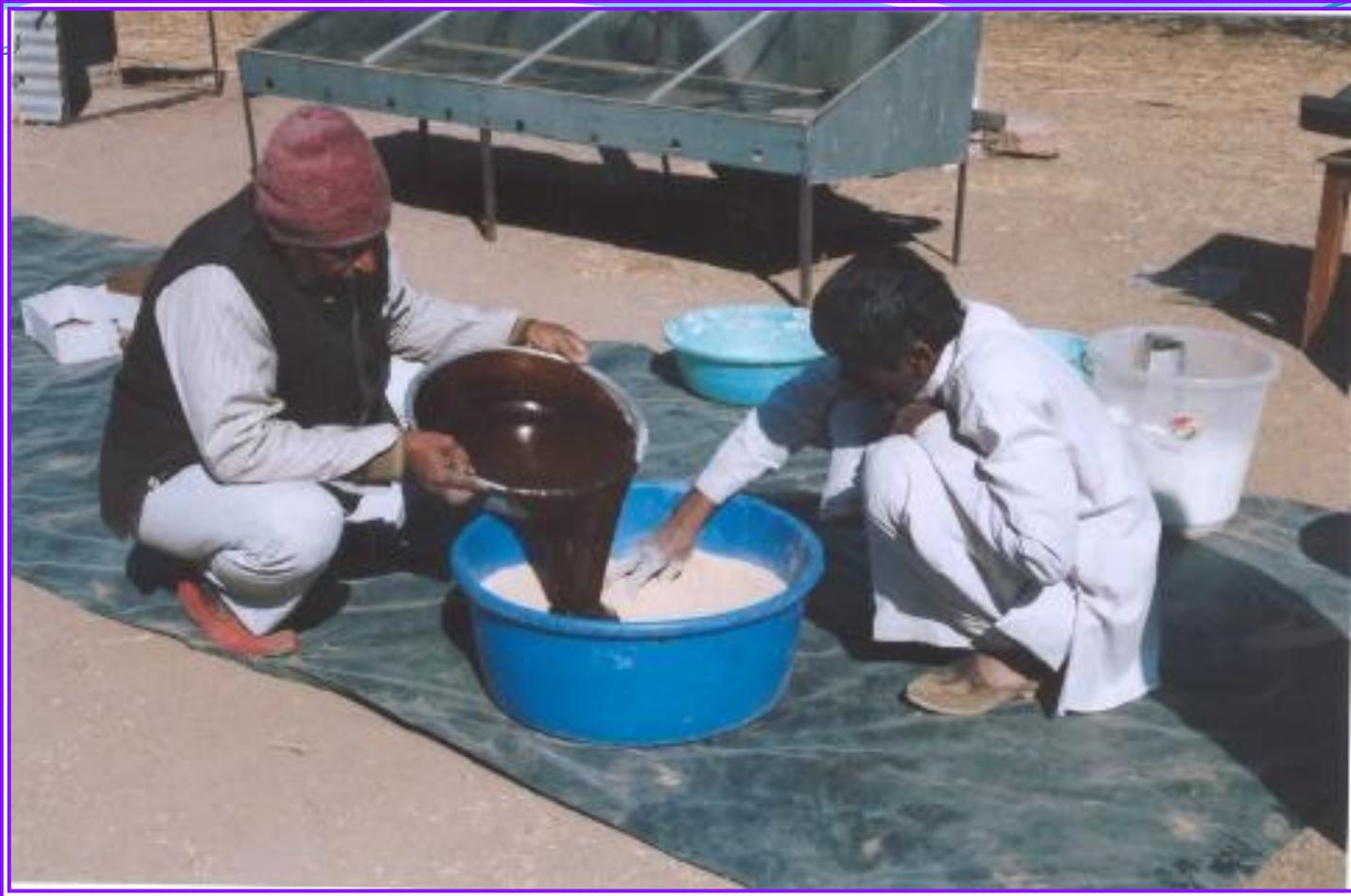
**4. Pour all-mineral mixture into urea-molasses solution and go on mixing till homogenous suspension of urea-molasses-mineral is obtained.**



**5. Take 7.400 kg wheat bran in a large sized plastic tub and add to it 0.500 kg de-oiled soybean meal or any oil-seed cake.**

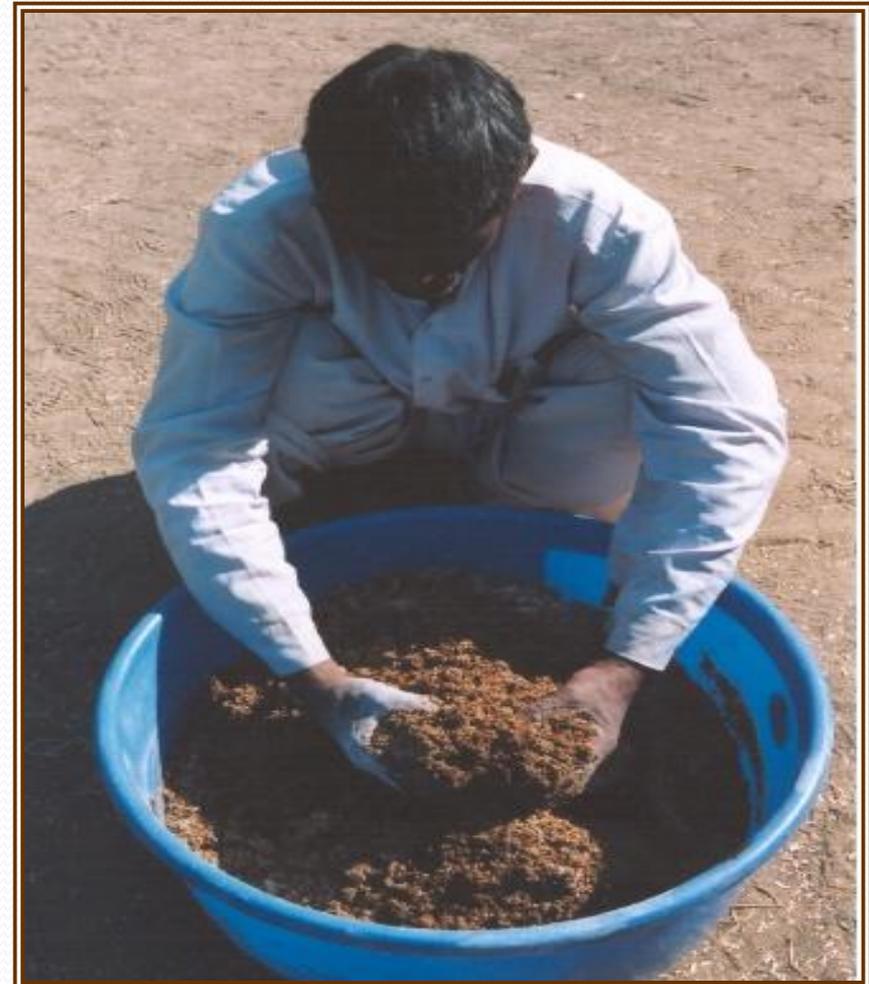
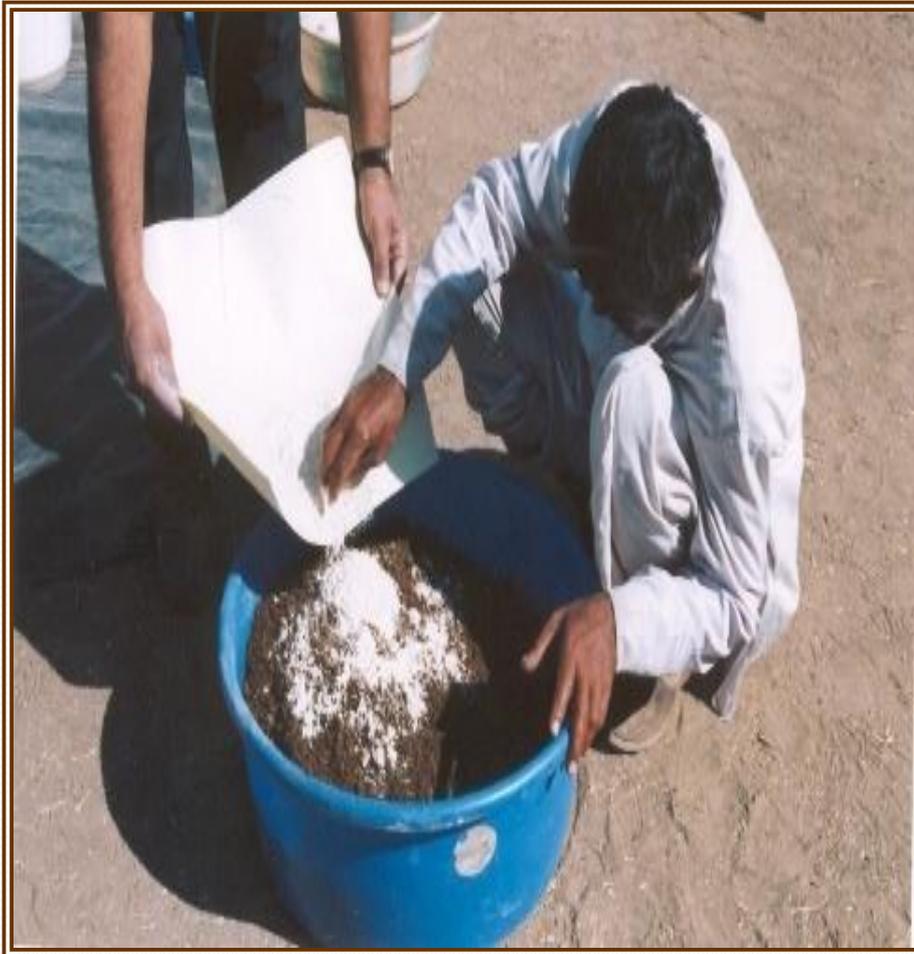
**Mix well.**





**6. To this mixture, pour suspension of urea-molasses mineral ingredients (III), and mix all these contents till there is coating of (III), over the wheat bran-soya meal mixture.**

**7. At last, slowly, sprinkle 240 grams of dolomite or guar gum dust over the above mixture (IV) and mix thoroughly all the ingredients.**



## 2. Pressing of Ingredient Mixture

# Processing & Mixing of ingredients



**Weigh desired quantity of above mixture.**



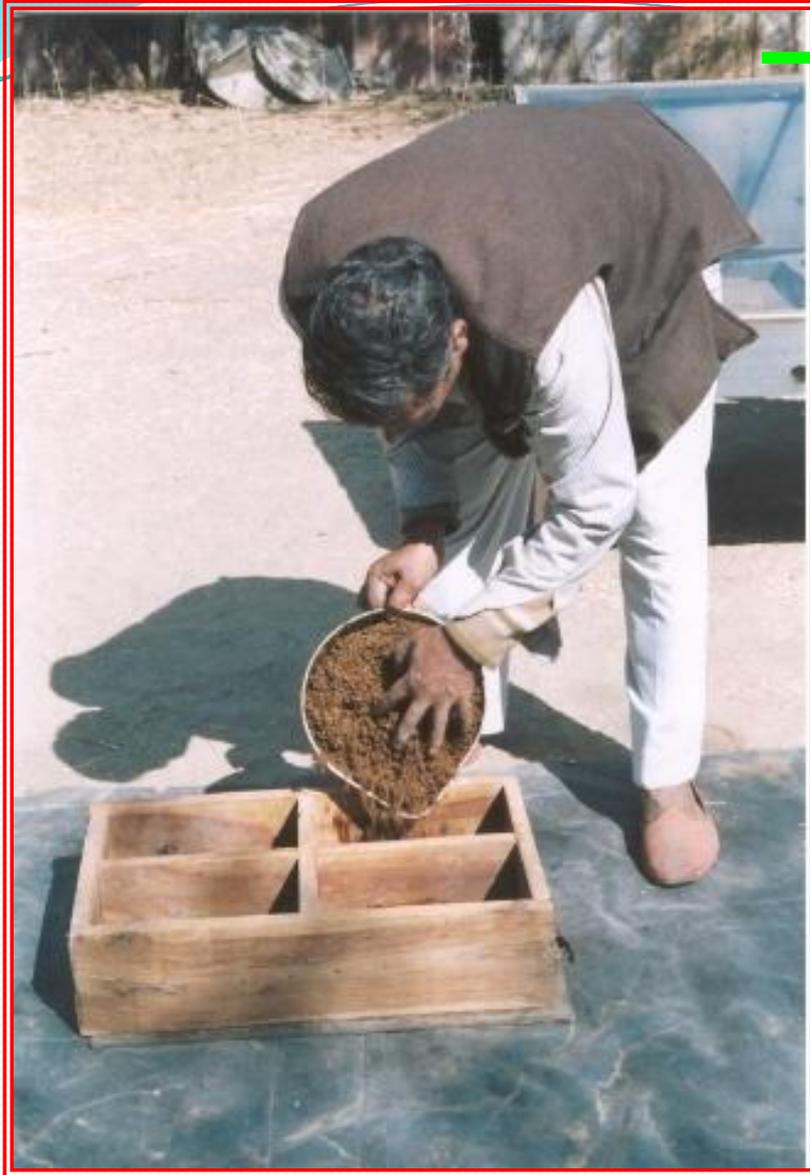
Transfer weighed mixture into the iron mould,

and press the material with screw type hand press machine





**Allow to keep the pressed material in the mould for 24 hours.**



**Alternatively mixture can be pressed in wooden mould.**

# 3. Drying of Pressed Material

**Dry the pressed material in: Solar drier or industrial electric oven**



**The dried block should not contain more than 15% moisture.**

**Dried feed block can be packed in a polythene wrapper.**



## Feeding of Urea-Molasses mineral blacks



**Heifers & a Milch Cow Licking Feed Block**

# *Licking the Urea-Molasses mineral Block*





## **Buffalo Feeding on**

**Wheat Bran- Molasses  
Multi-nutrient Feed Block**

### **Effects**

- ❖ **2-kg block in a buffalo last for 5-days.**
- ❖ **Increased Feed intake**
- ❖ **Corrected pica**
- ❖ **Increased daily milk yield by 23%.**



**Questions?**