



सत्यमेव जयते  
Ministry of Rural Development



# Technical Bulletin Cattle Rearing

**A Sustainable Livelihood  
for SHG Women  
Part III: Feed and  
Fodder Management  
of Cattle**

# Introduction to Cattle Farming

The Deendayal Antyodaya Yojana - National Rural Livelihoods Mission (DAYNRLM) is a flagship program of Govt. of India, dedicated to eradicating poverty and promoting sustainable livelihoods in rural areas. DAY-NRLM focuses on empowering rural women through the formation of Self-Help Groups (SHGs) and community institutions. The DAY-NRLM is making concerted efforts to augment livelihoods of SHG women through multiple farm, allied and non-farm activities. Cattle rearing is one of most crucial components among these activities. It offers SHG women an opportunity to generate income, achieve self-sufficiency, and strengthen their economic prospects.

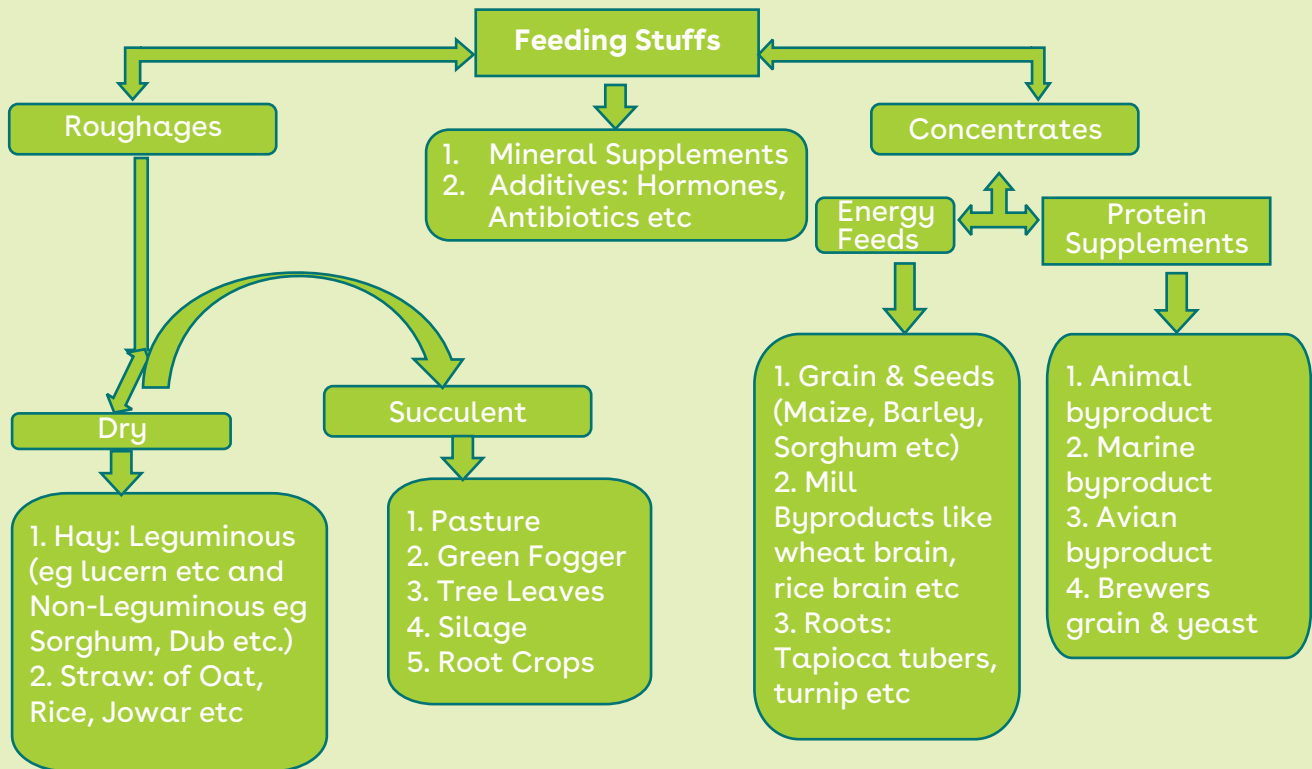
With its adaption to diverse environments and being complimentary to agriculture farming, cattle farming presents an attractive opportunity for SHG women. It is easy for farmers with even small land holding to rear cattle as the waste from the crops and fodder grown becomes nutrition for the cattle. This bulletin aims to equip the farmers with the knowledge necessary for efficient and profitable cattle rearing. The Technical Bulletin has been structured into four parts to serve as a comprehensive resource for individuals and organizations seeking to enhance their knowledge and skill in cattle farming. Each part offers specific insights and guidance, covering various aspects of cattle rearing, from its significance to selection of breeds, signs of healthy animal, feeding, health & disease management, and general management practices. By dividing the information into these distinct sections, the Technical Bulletin aims to provide a systematic and accessible resource that equips readers with the knowledge and skills necessary for successful and sustainable cattle rearing. These four parts collectively offer a valuable reference for achieving success in the field. This section introduces to the Cattle farming, its relevance, feed and fodder management for cattle. With the potential to generate sustainable livelihood, cattle offer an accessible and economically viable opportunity for women to secure their financial independence.

## Benefits of Dairy Farming:

1. **Weather Independent:** Unlike many other agricultural sectors, dairy production is **unaffected by rainfall**. The feed and fodder required for feeding the dairy animal is either produced throughout the year or could be stored as hay for dry fodder and silage for green fodder in the season of excess production.
2. **Stable Pricing:** The price of milk in the market has **consistently held steady**, even during times of supply surplus. This stability benefits both producers and consumers.
3. **Growing Demand:** The demand for dairy products continues to rise, driven by both vegetarians and non-vegetarians. This sustained demand ensures a stable market.
4. **Easy to Market:** Marketing dairy products is straightforward. There's no need for specialized shops, and marketing expenses are relatively low compared to other industries.
5. **Guaranteed Income:** Dairy farming provides a **reliable annual income**, making it a unique industry in this regard.

The technical bulletin on cattle rearing has five components viz. breeds of cattle, health management, housing of cattle and feed & fodder management. In this bulletin the feed and fodder management of cattle will be discussed.

## Feed and fodder



Livestock Feeds are generally classified according to the amount of a specific nutrient they furnish in the ration. They are divided into two general classes - roughages and concentrates. Roughages are bulky feed containing large amount of less digestible material i.e. crude fibre more than 18% and low (About 60 percent) in Total Digestible Nutrient \*\* (TDN) on dry air basis. Concentrate are feed which contain relatively small amount of fibre (less than 18 percent) and have a comparatively high digestibility and as a result higher nutritive value having more than 60 percent TDN.

Roughages are sub-divided into two major groups -Succulent and dry based on the moisture content. Succulent feeds usually contain moisture from 60-90% and dry roughages contain only 10-15 percent moisture. For the sake of convenience, succulent feeds are again classified into various types such as pasture, cultivable fodder crops, tree leaves, silage and root crops. Dry roughages have been further classified as hay and straw based on the nutritive values and method of preparation.



**Straw**



**Hay**

## Green Fodder



**Bermuda**



**Napier**



**Para grass**



**Guinea**



**Sorghum**



**Elephant grass**

A concentrate is described as a feed or feed mixture which supplies primary nutrients protein carbohydrate and fat at higher level but contains less than 18% crude fibre and low moisture.

### Feeding of the Cattle:

While considering the feeding schedule of a cattle, proper consideration should be given to the purpose for which the animal has to be fed. These are 1. Maintenance Ration, 2. Gestation Ration & 3. Production ration.

The following thumb rule may guide the Mahila Kisans to feed their livestock satisfactorily.

- 1. Maintenance Ration:** This is the minimum amount of feed required to maintain the essential body processes at their optimum rate without gain or loss in body weight or change in body composition. The discussion on this aspect will remain limited to the concentrate part of the ration as in most parts of India, green is seldom available. In urban areas of our land, straw is considered to be the only basic roughage. Under such circumstances, the object should be to compound concentrate mixture which will provide at least 20 per cent protein (14-16 per cent DCP\*) and 68-72 per cent TDN. Reasonable varieties of feed should be included so that when compounded, the mixture should be quite palatable and slightly laxative and balanced with minerals and vitamins, Variety of feed also offers other advantages, e.g., correction the imbalance of protein or minerals of one feed can be corrected by the other feed. The amount of concentrate and straw that provides optimum maintenance ration is given in table no 1.
- 2. Gestation Ration:** In the case of pregnancy, further allowance from the fifth month of pregnancy onwards must be made for proper growth of the foetus and to keep the mother fit for optimum milk production on calving. For this, in addition to maintenance ration, a further amount of 1.25 and 1.75 kg concentrate mixture is recommended for zebu and cross bred cow/buffaloes respectively.

Example 1: The nutritional requirement for an adult cow weighing 250 kg and at an advanced stage of gestation is as follows:

Item		Digestible Crude Protein	Total Digestible Nitrogen	Remarks
1	Straw 4 Kg (Digestible Crude Protein=0; Total Digestible Nitrogen=42)	0	1.68	
2	Concentrated mixture 2.5 Kg (Digestible Crude Protein=14 and Total Digestible Nitrogen=68 min) (1.25 kg for maintenance & 1.25 kg for pregnancy)	0.35	1.70	
		0.35	3.38	Given
		0.31	2.72	Recommended

**Table 1:balancing of ration straw & concentrateadd**

Now the question that may arise is how to compute concentrate Ration that provide 14-16% Digestible Crude Protein and a minimum 68% Total Digestible Nitrogen. For this, following assumptions are made:

Oil cakes	25-35 parts	To be fortified with 1% mineral mixture, 1-2% Salt and 20-30 gm vit AD3/100 kg, containing 50,000 I.U. Vit.A and 5,000 I.U. Vit D3 per gram
Millets/cereals	25-35 parts	
Cereal by-product	10-25 parts	
Pulse chuni	5-20 parts	

A Mahila Kisan desirous of producing concentrate mixture of her own should know the various types of ingredients required for making concentrate mixture ideal for livestock feeding. If she is not well conversant with the quality of raw feed ingredients and unconventional feedstuffs available in the region, she may not be able to compute an ideal concentrate mixture for her stock economically. The various types of feed ingredients generally used for computing concentrate mixture is given below:

1. **Protein Supplements (Primary sources of protein):** The protein is important component of cattle diet. It is responsible for growth, lactation and body weight gain.
  - a. Vegetable protein supplements: Azolla, groundnut cake, sesame cake, cotton seed cake, mustard cum linseed cake, legumes etc.

### Green fodder (protein rich diet)



**Cowpea**



**Lucerne**



**Berseem**



**Green Gram**



**Black Gram**



**Dhaincha**

- b. Animal protein supplement-fish meal, skim milk powder etc.
- 2. Grain supplement (primary source of energy)-cereal grains like maize, wheat etc, millet grains like jowar, milo etc.
- 3. Cereal byproduct
- 4. Pulse chuni



**Concentrate**



**Different types of pulses**

**5. Salts, Minerals & Vitamins**

In the formulation of any concentrate mixture, primary consideration is given to protein and energy content of the ration which are satisfied by selecting suitable protein supplements and grain supplements respectively. In general, cereal by-products are palatable and laxative; they furnish good amount of minerals, particularly phosphorus except in maize and bran which are mostly used as diluents to protein and energy supplements. Pulse chunies are also palatable and supply medium energy depending on the amount of husk present in them. If a good amount of broken pulses is present then the nutritive value of these chunies is much better than brans both in protein and energy content. The addition of salt (1-2 per cent) to the concentrate mixture increases palatability and supplies sodium and chlorine to the animal. Minerals are vitally important particularly when good quality greens are not available. When straw is used as a major source of roughage, mineral and vitamin supplements are essential. Commercial mineral mixtures are available for use in cattle ration and may be used at 1-2 per cent level, Vitamin mixture (Vit. A and D.; Vit A-50,000 I. U., Vit. D- 5,000 I.U. per gram) is also commercially available in suitable packs and its use 20-30 gm per 100 kg of concentrates will be sufficient. This amount of vitamin mixture is a must particularly when no or little greens are available to the stock. When straw is used as the sole source of roughage, the addition of 1-2 per cent limestone powder (should pass through 150 mesh) will be very beneficial.

- 3. **Production Ration:** Production ration is the additional allowance of ration for milk production over and above the maintenance requirement. For Zebu 1 kg additional amount of concentrate is required for every 2.5 kg of milk over and above the maintenance requirement while the same amount of concentrate is required for every 2.0 kg of milk for cross-bred.

Item		For Zebu Cattle	For Cross-Breed
1	Straw	4 kg	4-6 kg
2	Concentrated mixture (with straw only or with little green)	1-1.25 kg	2 kg

As before, let us now examine whether in reality the above quantity, satisfies the requirement:

Eg: A zebu cattle weighing 250 kg and producing milk of 4-5% fat will be

Item		Digestible Crude Protein	Total Digestible Nitrogen	Remarks
1	Straw 4 Kg (Digestible Crude Protein=0; Total Digestible Nitrogen=42)	0	1.68	
2	Concentrated mixture 2.85 kg (1.25 kg for maintenance & 1.60 kg for production)	0.4	1.94	
		0.4	3.62	Given
		0.31	3.38	Recommended

In case of high milk yielder beyond 15 kgs, this thumb rule may not apply in totality so an extra 10 kg of green grass may be added to the feed chart. One Kg of concentrate may be replacement for every 6-8 Kgs of legume green fodder or 15-20 Kgs of green grasses.

\* Digestible Protein (DCP)- the amount of crude protein actually absorbed by the animal (crude protein minus the protein lost in feces).

\*\* Total Digestible Nutrients (TDN): The sum of the digestible fiber, protein, lipid, and carbohydrate components of a feedstuff or diet. add these lines



This document is developed by  
National Mission Management Unit, DAY-NRLM  
with support from TA-NRLM (Transforming Rural India Foundation)