

## TMR and CFB- A Conducive Revolution in Livestock Feed

Anusmita Baishya<sup>1</sup>, Abhishek Parmar<sup>2</sup>, Reema Shrestha<sup>3</sup>, Anupam Thakuria<sup>4</sup> and Vipul Patel<sup>5</sup>

<sup>1</sup>PhD scholar (LPM), ICAR-NDRI

<sup>2</sup>PhD (Animal Nutrition), AAU, Anand

<sup>3</sup>SRF (Animal Nutrition), AAU, Guwahati

<sup>4</sup>Veterinary Officer, Government of Assam

<sup>5</sup>Assistant Professor, NAU, Navsari

ARTICLE ID: 037

### Total Mix Ration (TMR)

A TMR is a method of feeding cows that combines all forages, grains, protein feeds grains, protein feeds, minerals, vitamins and feed additives formulated to specified nutrient concentration into a single feed mix.

### Preparing of TMR

- Dry ingredients of small particle size will stick to high moisture ingredients such as silage or molasses. Therefore, it is important to properly mix the dry ingredients before adding the wetter ones.
- Low density ingredients with long particle length, followed by high density ingredients of small particle size that will sink.
- Long hay needs to be processed and liquids should be the last ingredients.
- If further processing of forages is not desired, add first grains or premixes followed by those ingredients that are incorporated in small amounts such as minerals and vitamins.
- Adding hay as the first ingredient and then the premix.

### Importance of TMR

- With a TMR, a cow eats a nutrient balanced ration in every bite or mouthful she consumes.
- Cows eat predetermined amount of forages and concentrates necessary for good production and health. Selective consumption of feeds by cows is minimized.

- TMR mixers can reduce the work of feeding cows and save labour costs.
- It provides more control and accuracy of the feed amounts fed than when feeds are fed as separate ingredients.
- Feeding TMR correctly balanced to nutrient specifications can increase milk production 1 to 2.5 kg per cow per day.
- Milk fat and other components can increase because of the better rumen fermentation and balance of nutrients being consumed.

### **Guidelines for TMR feeding**

- 2-3 weeks before calving cows need a ration that is high in fibre and contains all the nutrients required to prepare for the impending birth of the calf, the initiation of lactation and help prevent metabolic problems. This ration should contain about 3kg of grain, 2 to 3 kg of good quality hay plus forage like corn silage and the proteins, minerals and feed additives needed to make the ration very palatable.
- Fresh cow group, 1-21 days after calving. These cows have a low dry matter intake, but a high nutrient requirement as they begin the lactation. The ration should contain adequate fibre to help promote good rumen function plus other forages and concentrates to get the cow off to a good start towards high milk production and moving into high production group.
- High producing older cows group is where peak milk production and peak dry matter intake occur.
- Mid lactation cow's ration should be higher in forages and slightly less nutrient dense than the high group ration.
- Dry cows 220 to 260 days pregnant should contain medium quality forages to promote maximum rumen fill and rumination. Adequate protein and proper mineral balance in the ration is required ident dense than the high group ration.

### **Benefits of TMR feeding**

- **Improved rumen fermentation:** Cows have complete access to complete and balanced ration throughout the day. Thus, they tend to consume smaller but more meals per day, spread out evenly during their day. This prevents slug feeding that overloads the rumen with nutrients and unbalances the process. In contrast, rumen processes are optimized, digestibility improves, ph stabilizes and microflora

receives a balanced mix of all nutrients required for fermentation towards a desirable outcome.

- **Increased dry matter intake:** As digestive functionality and health are sustained at high levels, and in conjunction with continuous feed availability, cows consume more dry matter. They cannot pick out undesirable ingredients, leading to much better efficiency of feed utilization and less residual feed.
- **Enhanced milk production:** As it can be anticipated, a healthy cow with a functioning rumen, free of digestive disorders and exhibiting maximal feed intake will produce more milk.

#### **Demerits of TMR**

- Cows should be grouped by production levels. Grouping of cows is not feasible in small herds less than 50 cows.
- The equipment must have the capability to thoroughly blend the feed ingredients.
- The mixture wagon preferably mobile must be capable of accurately weighing each ingredient.
- Intensity of management increased.
- Forage analysis is necessary.

#### **Compressed complete feed block (CFB):**

Weighed quantity of the mixed ingredients is transferred into densification machine which compresses the forage and concentrate mixture into densified complete feed block.

#### **Components of CFB:**

- The major components are forage and concentrate, added in different ratios depending upon the level of production.
- The forage part is generally the crop residues such as wheat, ragi or paddy straw, sorghum stalk, sugarcane tops, maize stover.
- In hilly areas even non-conventional forages like grasses and tree leaves have been used.

#### **Proportion of components:**

- The proportion of the straw and concentrate in the block varies with the type of animal to which it is to be fed.

- 86parts straw, 10parts molasses, 2parts mineral mixture, 1part urea and 1part salt.
- The proportion of straw for animals yielding upto 5-10kg milk per day should be reduced to 60%, for 10-15kg milk per day upto 50% and for 15-20 kg milk per day upto 40%.

#### **Ingredients of concentrate mixture:**

- The ingredients of the concentrate mixture are oil cakes, molasses grains, by products as energy sources and supplements such as bypass protein and fat.
- Bypass nutrients can be added for the higher yielders to enhance the direct supply of amino acids and fatty acids.
- Concentrate will increase the energy for production.
- The mineral component provides strategic and catalytic supplements such as micronutrients and other feed additives.
- Vitamins, minerals, bentonite, probiotics, enzymes, antioxidants, immune-protective agents, herbal extracts are added in CFB.
- The varied role of these components in the feed block is to increase the productive and reproductive efficiency of the animal, enhance its immuno-protective ability, reduce helminthic load and decrease ruminal methanogenesis.

#### **Procedure of making CFB:**

- The first step in the process of making CFB is the grinding of concentrate ingredients, followed by their mixing and addition of feed additives.
- Mixing of these ingredients and straw in proper proportions along with addition of molasses.
- Finally, the weighed quantity of the mixed stuff is transferred into hydraulic pressure and subjected to the preparation of blocks at 4000psi in an automatic or manual feed blocking machine.

#### **Benefits of complete feed block:**

- Provides a balanced ration to ruminants.
- It needs less space for storage.
- It is trouble free and easier to transport.
- There will be less feed wastage.
- Improves productive and reproductive performance.

- Health status improves.
- Feed block can be a medium for administration of medicine.
- Better utilization of non-conventional feed ingredients.
- Economic production.

**Reference:**

Karangiya, V. K., Savsani, H. H., & Ribadiya, N. K. (2016). Use of densified complete feed blocks as ruminant feed for sustainable livestock production: A review. *Agricultural Reviews*, 37(2).

Haloi, S., Bhuyan, R., Borah, L., & Saikia, B. N. (2021). Complete feed block as a mode of enhancing ruminant production: A review. *Indian J Anim Health*, 60(1), 10-15

