

Scientific Feeding of Dairy Animals



Dry fodder

Green Fodder

Mineral Mixture

Concentrates

Bypass fat

Silage



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Introduction:

In Goa, dairy farmers are maintaining indigenous cattle, crossbred cattle and buffaloes for milk production. To get maximum milk yield from the lactating animals, farmer has to feed balanced feed to their animals which fulfils required energy, protein, mineral and vitamin requirement of the body. Farmers incurs 70-75% of total dairy farming expenditure on feeding of the animals. To make dairy farming profitable, dairy farmer has to cultivate green fodder at his own farm. He can do silage when fodder is surplus. He has to get dry fodder and feed ingredients required for concentrate feed preparation from his own farm. To get maximum yield from dairy animals, farmer has to feed greens either in the form of fresh green fodder, silage or hydroponic fodder.



Nutrient requirement of Dairy animals:

Cattle and buffaloes requires five basic nutrients like proteins, carbohydrates, lipids, minerals and vitamins. Each nutrient has its own role in the body, like proteins are required for body growth, to fulfil wear and tear of body and also plays important role in milk production. The main sources of proteins are oil cakes like cotton seed cake, groundnut cake, sunflower meal etc. and other sources are seeds and by-products of black gram, red gram, cowpea, oiled or de-oiled rice bran and wheat bran, etc.

Carbohydrates are source of energy which required to run the basic activities of the body. Fats are another source of energy which provides almost 2.5 times more energy than proteins and carbohydrates. Animals get fats from oil seed cakes and feed supplement like bypass fat. The main sources of carbohydrates are grains like jowar, pearl millet and maize etc. Maize grain has a higher energy content than

other grains hence in most of the animal feeds, ground maize is used as source of energy (13.5MJME/Kg DM).

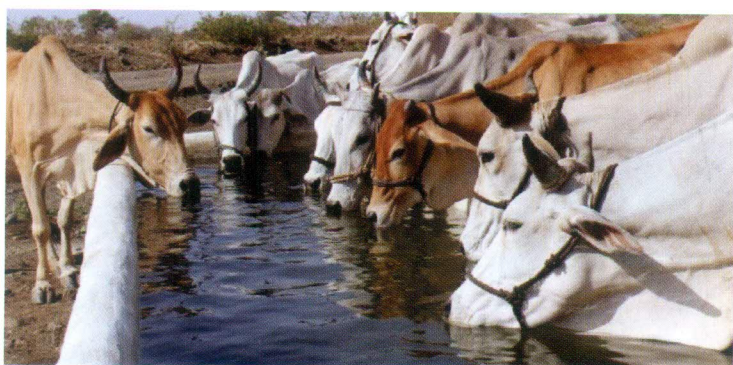
About 15 minerals are required for the good production and reproduction of dairy animals like Calcium, Phosphorus, Magnesium, Sulphur, Copper, Cobalt, etc. Dairy animals can make some vitamins in their own body like B complex, Vitamin C, Vitamin K and Vitamin D in the presence of sunlight but externally we have to provide Vitamin A and Vitamin E. These vitamins are fulfilled either through green fodder or mineral mixture.

Now a days chelated mineral mixture / mineral licks are available in the market. As per the recommendations of manufacturing companies, mineral and vitamin supplement should be given to all type of animals i.e. bulls, heifers, pregnant and lactating animals etc. Daily feeding of mineral mixture improves milk production and improves reproductive efficiency of male and female animals. Feeding of mineral mixture improves growth and development in calves and heifers hence heifers show early puberty. It helps to improve feed intake and improves immunity of the animal.



Water requirement:

It is an important nutrient and constituent of every living tissue. It is the major component of various body fluids like blood, urine, lymph, saliva, tears etc. It helps in lubrication of joints. It is an ideal solvent for nutrients. Water plays an important role in thermoregulation of body and in maintenance of acid base equilibrium in body. It is essential in metabolism of nutrients and helps in the transportation of nutrients through blood to all the tissues. It helps in the excretions of metabolic waste products and toxicants through urine. Water helps to maintain strength and rigidity of cells and also keeps the gastro-intestinal, reproductive and urogenital tracts moist.



Adult cattle drinks 3-5 ltr water per kilo dry matter intake. Milking cows requires additional amount of water i.e. at least 3 litres of water per kilo milk yield. High yielding cows need more than 150lit of fresh water every day. Water intake increases in advance pregnancy. Feed with relatively high moisture content decreases the quantity of drinking water required. Presence of minerals salt, particularly NaCl in diet, fibre and silage in diet increases water requirement. Clean water should be provided for 24 hours by arranging automatic waterer or other plastic or stainless steel bowl arrangements. Provide 50-80 litres of drinking water to adult dairy animals per day.



Animal Feeds:

Animal feeds are broadly classified into two categories as roughages and concentrates.

1. Roughages:

These are main source of bulk and energy for animals which contains more than 18% crude fibre and less than 60% total digestible nutrients. Roughages are low digestible than concentrates and are mainly classified as dry and green.

A) Dry Roughages:

Dry fodder is required to get sufficient fat in the milk. The sources of dry fodder are hay, stovers like jowar kadbi and straws like paddy straw, wheat bhussa, Karad grass which contains 10-15% moisture . Total 3-6 kg of dry fodder / day is required to adult cattle. As such, dry fodder only satisfies hunger of the animal and doesn't contain much nutrients, most of them have only 2.5-3.0% crude protein.

Enrichment of dry fodder:

To enrich dry fodder, urea treatment is recommended. For 100 kg dry fodder, sprinkling of 4 % urea treated water (40liter of water) is done in layer wise. Preservation of such dry fodder is required in air tight condition for 21 days. The farmer can feed such enriched fodder to all animals except calves.

B) Green Roughages:

This consists of pastures, cultivated fodders, tree leaves and silage. Green fodder is required to maintain

good health of dairy animals. Feeding of greens round the year maintains high milk production and improves reproduction. Feeding of green fodder alone can sustain about 10 litres of milk production per day with an average 20% savings on feed cost.

2. Cultivated fodders are classified as follows:

A) Leguminous fodders:

These fodders are rich source of proteins (15-20%) and in calcium, Vitamin A and D. They are more palatable and Lucern, Berseem and Cowpea are some examples of such fodder. In Coastal climate, instead of Lucern and Berseem cultivation farmer can grow fodder cowpea.

B) Non leguminous Fodders:

Includes cereal fodder crops like maize, sorghum and cultivated grasses like Para grass and Hybrid Napier. In Goa, farmers are cultivating Hybrid Napier fodder CO-5 and getting 300-350 metric tons of green fodder yield per hectare with 6- 7 cutting in a year. A lactating cow weighing 300 to 500 kg body weight needs approximately 20-25 kg greens for the body development and production. If farmer is not feeding greens or if there is scarcity of greens then to maintain milk yield he needs to feed good quality 1 kg concentrate feed (20-22% crude protein) to replace 10 kg green fodder. Thus cost of milk production will go high if farmer is feeding concentrates to replace greens.

If farmers have space constraint, they can purchase the green fodder from other farms or they can procure and feed silage. Silage is a preserved green fodder mostly prepared by using chaffed maize fodder and preserving in anaerobic condition. Silage can be used as alternate to green fodder. Bag silage technique is simple and farmer can make silage in 50 - 100 kg bags.



3. Concentrates:

Concentrate feed is a mixture of different feed ingredients like cereal grains (maize, rice kani etc), cereal grain byproducts (rice polish, dried grains etc), oil cakes (soybean meal, groundnut cake, cotton seed cake etc), mineral mixture and common salt in different ratios as per the requirement.

Examples of Concentrate Mixture:

Feed Ingredients	Formula - Parts by wt. (kg)			
	No. 1	No. 2	No. 3	No. 4
Maize grain (Ground)	35	35	35	35
Soybean Meal	15	20	0	10
Groundnut Cake	15	0	24	15
Cotton Seed Cake	0	12	24	14
Rice Polish	32	30	14	30
Mineral Mixture	2	2	2	2
Common Salt	1	1	1	1

In the market cattle feed is available in three forms i.e. All mash type, Pellet type and Crumble form. As per the availability of the feed ingredients in the local market, transport cost and prices of ingredients, farmer can make best quality concentrated feed for his dairy animals or purchase best quality concentrated feed from reputed organisations or companies which meet BIS feed standards.



4. Bypass fat :

Bypass fat feeding technology is standardised by ICAR - CCARI, Goa. Bypass fat is a source of energy made up of palm fatty acids and calcium oxide. During early lactation from calving to 3month of post calving, good yielding cows are under negative energy balance due to stress of calving, colostrum production and peak milk production. These stress factors effects on milk fat percentage and conception. Feeding of bypass fat feed supplement @ 100-200 grams per 10 litre of milk production increases milk fat and yield by 10-20% and also improves conception rate by 80-100%. Bypass fat feeding gives good results in early lactation up-to 3 to 4 months of post calving.



Thumb Rule for feeding of cattle and Buffaloes:

The average dry matter (DM) requirement of Deshi cow is 2 (dry) to 2.5 (lactating) kg/ 100 Kg body weight/ day while it is 2.5 (dry) to 3 Kg in crossbred and buffaloes. The roughage requirement is fulfilled through green and dry fodders. About 2/3 DM requirement is to be fulfilled through dry fodder and 1/3rd from green fodder.

The concentrate requirement of animal for maintenance, production and pregnancy can be achieved as follows:

1. The maintenance requirement of Deshi cow and Crossbred cow / buffalo is 1 and 1.5 kg respectively. Maintenance ration is minimum allowance of ration given to the animal for carrying out its essential body processes at optimum rate without gain or loss in body weight or change in body composition.

2. Lactating animals should be given 1.0 kg of additional concentrate allowance for every 2.5 kg (buffaloes) to 3.0 kg (Cow) milk produced.
3. Pregnant cows/ buffalo should receive 1.5 kg/ day extra concentrate allowance during advance pregnancy to meet extra need of nutrients for growth of foetus.
4. Breeding bulls in service should get 1kg/ day extra concentrate allowance to maintain good health and sex libido.
5. Mineral mixture and common salt each @25-50 gm should be given to fulfill mineral requirement of animal.



Importance of use of chaff cutter:

Cattle and buffaloes should always be fed chaffed dry and green fodder. By use of chaff cutter, farmer can prevent 30-40% wastage of fodder. Ideal size of chaffed fodder should be 0.5- 1 inch.



Precaution while feeding calcium:

Any oral calcium or mineral mixture should not be fed 15 days before expected delivery to avoid milk fever condition in dairy animals.

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