

# Feeding of dairy animals

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## Ration schedule for dairy animals from three months to maturity

Breed of animal	Concentrate kg	Roughage kg
<b>From 3 to 6 months</b>		
Hariana	(a) 1.0-1.5 or	Green oats or maize- 10 kg
	(b) 0.2-1.5 or	Berseem 1.5-2.5 kg +dry fodder 2 kg
	(c) 1.4-2.0	Green fodder 3 kg +straw 2 kg
Murrah	(a) 1.2-1.5 or	Green oats or maize or silage 10-12 kg
	(b) 0.2-1.5 or	Berseem 1.5-2.5 kg +dry fodder 2 kg
	(c) 1.4-2.0	Green fodder 3 kg +straw 2 kg

## From 3 to 4 months (75-90 kg)

Breed of animal	Concentrate kg	Roughage kg
Holstein	2.0	7.5-8.0 kg green oats or maize and alike fodders
Brown Swiss	2.0	5-10 kg
Jersey (60 kg)	1.6	5-10 kg
Holstein x Hariana	2.0	5-10 kg
Brown Swiss x Hariana	1.6	5-10 kg
Jersey x Hariana (60 kg)	1.6	5-10 kg

## From 4 to 6 months (90-100 kg)

Breed of animal	Concentrate mixture kg	Roughage quantity kg
Holstein	2.0	10-15 kg
Brown Swiss	2.0	10-15 kg
Jersey	1.8	10-15 kg
Holstein x Hariana	2.0	10-15 kg
Brown Swiss x Hariana	2.0	10-15 kg
Jersey x Hariana	1.8	10-15 kg

# From 6 to 12 months

<b>Breed of animal</b>	<b>Concentrate mixture kg</b>	<b>Roughage quantity kg</b>
Hariana	(i) 1.0 or	Green oats or maize- 15-20 kg
	(ii) 1.0 or	15-20 kg Berseem and + dry fodder
	(iii) 2.0	2.0 to 3.0 kg Wheat straw + green oats 5 kg
Murrah	(i) 1.25 or	Green oats or maize 20-25 kg
	(ii) 1.00 or	25-30 kg Berseem and + dry fodder
	(iii) 2.00	5 kg Straw wheat straw + green 3.0 kg

## From 6 to 9 months (100-150 kg)

Breed of animal	Concentrate kg	Roughage kg
Holstein	2.5	Green maize, sorghum or green oats (15-20 kg)
Brown Swiss	2.5	15-20 kg
Jersey (80-120 kg)	2.0	10-15 kg
Holstein x Hariana	2.5	15-20 kg
Brown Swiss x Hariana	2.5	15-20 kg
Jersey x Hariana (80-120 kg)	2.0	15-20 kg

# From 1 year to age at conception (heifers)

<b>Breed</b>	<b>Concentrate kg</b>	<b>Roughage kg</b>
Hariana (130-300 kg)	(i) 1.5 or	Green oats or maize 25-30 kg
	(ii) 1.0 or	Berseem + dry fodder 30-35 kg
	(iii) 2.0	Straw + green 4-5 kg
Murrah (140-300 kg)	2.0	Green oats or maize 30-35 kg
Exotic	(i) 2.0 or	Green oats or maize 30-35 kg
Cross bred (200-300 kg)	(ii) 1.5	Berseem + dry fodder 30-35 kg

# Feeding dairy cows

- The low average milk production of *Bos indicus* cattle and buffalo is mainly because they have been bred for draught purposes, disease resistance, tolerance to tropical climates and poor nutrition.
- Multipurpose animals produce 500-1000 litres of milk in one lactation with a peak of three to five kilograms per day.
- High producing crossbreeds produce between 2400-4000 litres of milk per lactation.
- Therefore, in feeding the dairy cow or buffalo, farmers should consider at one extreme a zebu cow weighing 250 kg, producing one to two kilograms of milk per day and consuming wheat or rice straw and a little grazing.
- At the other extreme could be a cross bred cow or Murrah buffalo weighing 500 kg and producing about 20 to 30 kg of milk per day, at six per cent fat in the case of buffalo, and receiving about 20 to 25 kg green fodder and 8 to 12 kg of concentrate.



- **The primary objectives in feeding the dairy cow or buffalo are: to allow maintenance and growth to mature body weight; to provide nutrients for the production of a calf after every 12 to 15 months, and to promote optimum quantity and quality of milk.**
- **Calorimetric studies have revealed that during lactation, heat production in an animal of 453 kg body weight is increased by over 2000 kcal per day. For high producing animals to meet energy requirements, higher levels of intake are required which depresses digestibility. This results in the ME available to the animals for conversion into milk being less than the calculated value.**
- **Taking all these factors into consideration the NRC recommends an increase of three per cent feed for each 10 kg of milk produced above 20 kg/day.**

- **In a normal practice on farms, the ration of a dairy cow or buffalo consists of two parts, namely: maintenance and production.**
- **The maintenance part of the ration depends upon the body weight while production is dependent upon the level and composition of the milk.**
- **If a crossbred cow weighing 400 kg and producing 10 kg of milk per day with five per cent butter fat is fed 70 kg of berseem or green cowpea equivalent at 15 per cent dry matter the critical requirements of protein and energy are met.**
- **The digestible crude protein level is higher than the requirement and the TDN requirement for 10 kg of milk production is met with berseem.**

- **High quality feeds such as berseem feeding can be used as a basal roughage with no concentrate needing to be fed for up to eight liters of milk production. Similarly lucerne and cowpea can be fed solely for up to eight kilograms of milk production.**
- **The cheapest feed for milk production is good quality fodders. Problems of bloat can be managed by introducing feeds gradually; it is advisable to feed about 2 to 2.5 kg of good quality hay with legumes.**
- **For a wheat straw and concentrate mixture addition of Vitamin A and phosphorus are needed and can be supplied through a synthetic source of Vitamin A and 100 g of sterilized bone meal for phosphorus.**

## Feeding dry cows

- **Dry and non-pregnant cows need to be fed a maintenance ration. Requirements for a 400 kg cow are 0.25 kg DCP, 3.0 kg TDN or 10.8 Mcal of ME, 17 g calcium and 13 g phosphorus.**
- **Feeding 25 kg of green maize or good quality sorghum containing one per cent DCP, 14 per cent TDN or 60 Mcal ME, 0.6 g calcium and 0.5 g phosphorus per kg of green fodder, meets requirements, as does eight kg of green berseem or lucerne and 5.5 kg of straw.**
- **When wheat straw with 1.5 kg of balanced concentrate mixture or 800 g of groundnut cake is fed, the ration is sufficient to maintain the animal. Straw plus Lucerne leaf in a ratio of 65:35 would maintain a dry cow.**

# Balanced concentrate mixture

- **Balanced concentrate mixture is prepared in such a way that 3.5 to 4.0 kg of it may support 10 kg of milk production when fed over and above the maintenance ration.**
- **In most farms this mixture is fed at one third of the milk yield in the case of cattle and up to half of the milk yield in the case of buffalo, since the buffalo milk is richer in fat.**
- **For production of 10 litres of milk at four per cent fat, the cow requires about 0.5 kg DCP and 3.7 kg TDN.**
- **Therefore, if the concentrate mixture contains 15 per cent DCP and 70 per cent TDN when fed at the rate of 3.5 kg over and above the maintenance ration, it would meet the DCP requirement for 10 kg milk production although TDN would fall short which could be made up by feeding roughage.**

- **With the tropical feeds it is difficult to prepare a mixture where one kilogram of concentrate mixture may contain more than 70 to 75 per cent of TDN unless high energy feeds, such as, maize, barley and gram are used in high proportions, which increases costs to perhaps economical levels.**
- **However, minimum quantities of cereals (10 to 20 per cent) along with the by-products may contain TDN between 70 to 72 per cent.**
- **All concentrate mixtures should be fortified with one per cent salt as well as calcium and other micro elements.**
- **Two examples of the balanced concentrate mixtures being used in various research farms in India are given below:**

# Concentrate mixtures

- **Groundnut cake= 20 %**
- **Wheat bran =45 %**
- **Maize= 22 %**
- **Arahar chuni= 10 %**
- **Mineral mixture=2%**
- **Salt=1 %**

## Feeding for reproduction

- Ideally, a dairy cow should calve at yearly intervals and should have a lactation length of about 300 days, but in practice calving intervals are often longer or lactation periods shorter.
- The cow therefore has a dry period of up to four to eight months. During this period the cow should build up body fat lost in early lactation which will be required to provide for the growth of the fetus and for the regeneration of mammary tissues.
- In the practice known as 'steaming up', dry cows are offered quantities of concentrate which increase gradually during the last six weeks of pregnancy. By the time of calving, the amount of concentrate given is about 75 per cent of the quantity the cow is expected to require in early lactation.



- **Steaming up is claimed to increase milk production, in part by preparing the cow for high intakes of concentrates that should be fed in early lactation.**

**During the last 60 days of pregnancy live weight increases by about 20 to 30 kg. The response to 'steaming up' probably depends on body condition at the beginning of the dry period. Restoring the reserves of the thin cow will probably have a greater effect on subsequent milk production than increasing the reserves of an already fat cow.**

- **Normally 50 per cent of DCP and 25 per cent of TDN of the maintenance requirements are fed above the maintenance ration.**
- **In order to cover these requirements 1.0 to 1.5 kg of additional concentrate mixture over and above the maintenance ration for a good cow and buffalo should be fed.**

