

## FEEDING OF DAIRY CALVES

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Feeding of dairy calves is one of the most important component of animal production. Well grown, vigorous animals are usually those that had excellent care from birth. Under nourished stunted calves often although not always may be grown out into large animals by careful feeding, but calves that are thrifty, vigorous and large at six month of age are much more resistant to disease but have a much better opportunity to develop into large useful animals. Under nutrition calves may be due to false ideas of economy on the part of the feeding as well as to a lack of knowledge of the principles and practices of successful calf rearing. The higher the plane of nutrition, the earlier is the onset of puberty and thus the quicker return of the capital.

The reticulo-rumen (biological fermentation chamber) is a non-functional, has an inherent capacity of about 2 liters at birth. The larger the period that the calf has an access to a plentiful supply of milk, the lesser it will eat other foods. Introducing roughage and concentrates in the diet of calves at an early age will help in early establishment of microbial population and development of rumen, resulting in utilization of coarse fodder and starchy foods into a form of energy available to young calves, synthesize B vitamins and synthesize protein from simple nitrogenous compounds. Energy requirement for calves is found to be greater per unit body weight than adult ruminants. Addition of protein of high quality will be an added advantage in the diet of calves until the rumen function will be at its optimum. The synthesis of B complex vitamin and

vitamin K by the microorganisms of the rumen is fully functional. Care must also be taken to supply required amount of calcium (Ca), phosphorous (P), sodium (Na), chloride (Cl), magnesium (Mg), potassium (K), selenium (Se), iron (Fe), copper (Cu), manganese (Mn), cobalt (Co), iodine (I) and zinc (Zn), in their diets. This knowledge will be helpful in evolving economic and convenient system of calf-rearing with solid foods.

In the light of Table 1, a schedule has been worked out for feeding calves economically giving allowance up to 60 days of age (Table 2). The schedule has been given age-wise rather than body weight.

**Method of Feeding**

Each calf should be given the colostrum of its dam within 6-8 hours after birth and subsequently twice daily for three days. A scheduled quantity of milk should be fed at body temperature of the calf in two halves, morning and evening. The antibiotic (Aurofac/Terramycin) may either be given with milk or mixed with calf starter. Calves may require little training during first few days after birth for consuming milk from open pail, afterwards, they start consuming their milk quota very quickly.

**Feeding Whole Milk**

Divide the milk allowance into equal fractions and the calf should be fed during the first seven days at as nearly equal intervals (3-4 as possible).

Table 1: Daily requirements of calves (N.R.C. Nutrient Requirements of Dairy Calves, 1978)

Body weight (kg)	Daily gain (g)	Feed DM (kg)	Protein (g)	TDN (kg)	DE	ME	Ca (g)	P (g)	Vit. A IU X1000	Vit. D. IU
25	300	0.45	111	0.54	2.38	2.14	6	4	1.1	165
50	500	0.76	180	0.91	4.01	8.61	9	4	2.1	330
75	700	2.10	318	1.72	7.67	6.71	15	8	3.2	495
100	700	2.80	402	2.10	9.26	8.09	18	9	4.2	660
200	700	5.20	620	3.45	15.20	13.01	21	14	8.5	1320

Table 2: Feeding schedule for calves upto three months of age

Age of calf	Quantity in grams			
	Whole milk*	Skim milk	Calf starter	Quality fodder
<b>Days</b>				
Ist-3rd	2500	-	-	-
4-7th	2500	-	-	-
<b>Weeks</b>				
2nd	3000	-	50	250
3rd	3000	-	100	350
4th	3000	-	300	500
5th	1500	1000	400	550
6th	-	2500	600	600
7th	-	2000	700	700
8th	-	1750	800	800
9th	-	1250	1000	1000
10th	-	-	1200	1100
11th	-	-	1300	1200
12th	-	-	1400	1400
13th	-	-	1700	1900

\*The basis of calculation of milk allowance is that for the first 3 weeks, it is 1/10 of the body weight, for next 2 weeks it is 1/15th and then it is given at 1/20th of the body weight.

Table 3: Composition of Calf-Starter

Ingredients	% composition
Skimmed milk powder	30
Crushed (Barley/maize/Wheat/Rice broken/Rice polishings (Last Step)	30
Protein concentrate of Ground nut cake/Cotton seed cake (decort)/Soybean meal (whole)/Til cake	32
Mineral Mixture*	2.6
Molasses	5.0
Salt	0.5
Antibiotics (Aurofec/Terramycin)	0.1
Antioxidant Butylated Hydroxy Toluene/Butylated Hydroxy Anisole/Thoxyquin/Carotenoids/Vit. E.	0.1

\*See Table 4

#### Substitution of Whole Milk by Skim Milk

Substitution of whole milk by skim milk should be a gradual one. When ever there is a large amount of foam on the skim milk, it may be removed by pedal or small card board. Foam is objectionable.

#### Calf Starter

An ideal calf starter contains 20-24% crude protein,

as desired. The percent composition of various ingredients of calf starter is given in Table 3.

The above calf starter shall cover most of your required specification. In order to meet the mineral requirements, the following mixture of salts is recommended (Table 4), assuming that 50 % of the requirement of salts is met through the feed ingredients proposed for calf starter.

Table 4: Mineral mixture for calf starter

Mineral in Feed	Quantity in feed	Name of Salt	Percent Concentration
Calcium (Ca)	0.77 (%)	Dicalcium Phosphate (DCP)	1.7
Phosphorus(P)	0.59 (%)	DCP	1.7
Magnesium (Mg)	0.10 (%)	Magnesium carbonate (MgCO <sub>3</sub> )	0.1
Sodium (Na)	0.06 (%)	Sodium chloride (NaCl)	Added
Potassium (K)	0.80 (%)	Potassium chloride (KCl)	0.8
Manganese (Mn)	10 mg/kg	Manganese sulphate (MnSO <sub>4</sub> )	0.003
Zinc (Zn)	20 mg/kg	Zinc carbonate (ZnCO <sub>3</sub> )	0.020
Iron (Fe)	10 mg/kg	Ferrous sulfate (FeSO <sub>4</sub> ·6H <sub>2</sub> O)	0.025
Cobalt (Co)	0.1 mg/kg	Cobalt acetate (Co (CH <sub>3</sub> COOH) <sub>2</sub> )	0.003
Iodine (I)	0.08 mg/kg	Potassium iodide (KI)	0.003
Copper (Cu)	4.00 mg/kg	Copper sulfate (CuSO <sub>4</sub> ·5H <sub>2</sub> O)	0.009
Selenium (Se)	0.1 mg/kg	Selenium sulfide (SeS)	0.007

### REFERENCES

- Maynard, L.A., J.K. Loosli, H.F. Hintz and R.G. Warner, 1985. Animal Nutrition. 7th Ed. McGraw Hill Publishing Co., New York, USA.
- Ranjhan, S.K., 1983. Animal Nutrition and Feeding Practices. 3rd Ed., Vicas Publishing House Pvt. Ltd. New Dehli, India.