

## Feeding and Ration formulation for sheep and goats

### Sheep

Sheep is dependent on natural pastures for maintenance and production. Rearing of sheep on concentrates is not the natural method. However due to limited availability of pasture, concentrate feeding becomes necessary. DM intake in stall-fed sheep is @  $2.5 \pm 3.5$  % of live weight. The nutrient requirement table has been given in appendix 7. Feeding is different physiological stages *i.e.*

- a. Pre-weaning period
- b. Growth period
- c. Finisher period

Upto 12 weeks of age, creep mixture/starter ration (17-18 % DCP and 75-77 % TDN) is supplemented with milk.

**Growth period:** Amount of concentrate depends upon the type of fodder available as given below:

Body weight (kg)	Good quality fodders (maize, oats, cowpea <i>etc.</i> ) and concentrate mixture	Poor quality fodders (straws, stovers <i>etc.</i> ) and concentrate mixture
10- 15	50	300
16-25	100	400
26-35	150	600

Concentrate mixture should contain 18-20 % DCP and 75-78 % TDN. The quantity is calculated depending upon the body weight and daily gain of lambs. About 250 g of

concentrate mixture (16 % DCP and 75 % TDN) in intensive rearing and 200 g concentrate mixture in semi- range condition meets the requirement upto 20 kg body weight.

**Finisher period:** In intensive rearing, 70 % concentrate and 30 % roughage of the required DM meet out the nutrient demand in this stage. However, in the semi-range condition, roughage part will be taken care of by usual grazing.

**Feeding of adult, breeding and lactating sheep:** If good quality fodders *e.g.* maize, cowpea, dub in green form is available, then the requirement can be met even without feeding concentrates. However, with poor quality fodder, concentrate feeding (as per requirement) should be done. Further for lactating sheep, 250 g concentrate mixture in addition to *ad lib.* legume hay upto 2 and half months in addition to maintenance allowance is given.

## **Goats**

Goats prefer browsing rather than grazing or nibble. Stall-feeding is preferred in urban areas. Goat consumes dry matter @ 3-4 % of live weight and may go up to 7 % in lactating goat. The nutrient requirement table for goats is given as appendix 8. Like sheep, feeding is done in three stages.

- a. Pre-weaning period
- b. Growth period
- c. Finisher period

**Pre-weaning period:** Creep mixture 17-18 % DCP and 75-77 % TDN can be fed. DCP content of creep mixture will depend upon the quality of fodder available.

**Growth period:** A complete ration containing 9-10 % DCP and 62-65 % TDN is adequate for optimum growth. About 20-25 % DM should come from good quality roughage and 75-80 % from concentrate mix having 9-11 % DCP and 75 % TDN.

**Finisher period:** A complete ration having 5-6 % DCP and 60-65 % TDN is adequate during the period of growth. For fatty finish, roughage should be about 20-25 %, however, for lean carcass, it should be 30-40 % of the total DM offered. Feeding during other physiological stages of male and female goat *i.e.* dry, dry pregnant, lactating pregnant, lactating and breeding bucks need supplementation of concentrate (except dry goat and breeding bucks) especially when good pasture is not available. A complete ration in general should provide about 5-6 % DCP and 55-60 % TDN.

Pre weaned lambs weighing (5.30 kg) are fed with creep mixture upto 12 weeks of age.

Growth @ 110-130 g/day

Maize flour	=	67 parts
GNC	=	10 parts
Wheat bran	=	10 parts
Fish meal	=	10 parts
Salt	=	1 part
Mineral mixture	=	2 part

**Exercise:** Compute a ration for a non-producing goat (50 kg body weight). The available feed ingredients are berseem hay and anjan tree leaves.

**Solution:** The nutrient requirement of the goats (as per NRC) is CP = 75 g and TDN = 530 g.

DM requirement of the animal is (@ 2.0 kg/100 kg b. wt.) = 1 kg.

<b>Ingredients</b>	<b>DM</b>	<b>CP</b>	<b>TDN</b>	<b>Fresh basis</b>
	<b>(kg)</b>	<b>(g)</b>	<b>(g)</b>	<b>(kg)</b>
<b>Barseem hay(13, 60)</b>	0.1	13.0	60.0	0.12
<b>Anjan tree leaves (8.3, 53)</b>	0.9	74.0	447.0	
<b>Total</b>	1.0	87.0	507.0	

**Exercise:** Compute a ration for a goat weighing about 30 kg and in late pregnancy stage. The available feedstuffs are oat fodder, berseem hay and concentrate mixture (GNC, wheat bran, maize grain).

**Solution:** Nutrient requirement of the goat (as per NRC) CP = 51 + 82 = 133 g and TDN = 362 + 397 = 759 g. The DM requirement of the animal @ 3.5 kg/ 100 kg body weight = 1.05 kg

#### **Preparation of concentrate mixture**

<b>Ingredients</b>	<b>Parts</b>	<b>CP (%)</b>	<b>TDN (%)</b>
<b>GNC (45, 75)</b>	25.0	11.25	18.75
<b>Wheat bran (13, 67)</b>	15.0	1.95	10.05
<b>Maize grain (10, 85)</b>	57.0	5.70	48.45
<b>Mineral mixture</b>	2.0	-	-
<b>Salt</b>	1.0	-	-
<b>Total</b>	100.0	18.9	77.25

**Final ration:**

<b>Ingredients</b>	<b>DM</b>	<b>CP</b>	<b>TDN</b>	<b>Fresh basis</b>
	<b>(kg)</b>	<b>(g)</b>	<b>(g)</b>	<b>(kg)</b>
<b>Concentrate mixture</b>	0.30	56.70	231.80	0.34
<b>Berseem hay (13, 60)</b>	0.10	13.00	60.00	0.12
<b>Oats fodder (10, 67)</b>	0.70	70.00	469.00	2.8
<b>Total</b>	1.10	139.70	760.00	

**Formula for inter-conversion:**

$$\text{DE (Mcal/kg/DM)} = \frac{\text{ME (Mcal/kg DM)} + 0.45}{1.01}$$

$$\text{DE (Mcal/kg/DM)} = 0.4409 \text{ TDN (\% of DM)}$$

$$\text{ME (Mcal/kg/DM)} = 0.45 + 1.01 \text{ DE (Mcal/kg DM)}$$

$$\text{TDN (\% of DM)} = \frac{\text{DE (Mcal/ kg DM)}}{0.04409}$$

$$\text{TDN (\% DM)} = \frac{\text{ME (Mcal/kg DM)}}{0.03616}$$

**Problem:** Find out the ME requirement of an animal with TDN consumption of 4.88 kg and DM intake 8.4 kg/day.

**Solution:** 8.4 Kg DM contain 4.88 kg TDN

So, 100 Kg DM contain  $4.88/8.4 \times 100 = 58.09$  % TDN

$\text{TDN (\% DM)} = \text{ME (Mcal/Kg DM)}/0.03616 = 2.10$

Therefore,  $58.09 = \text{ME(Mcal/kg DM)}/0.03616$

or,  $\text{ME(Mcal/kg DM)} = 58.09 \times 0.03616 = 2.10$

So, ME requirement per day =  $2.10 \times 8.4 = 17.64$  Mcal