

Feeding of Sheep and Goat

**DEPT OF ANIMAL NUTRITION,
Co.V.Sc. & A.H., JABALPUR**

Introduction

- Sheep and goats make a significant contribution to the rural income and employment
- They are source of income for people at hilly region specially
- AGR of goat 3.5% and sheep 2.0%
- In comparison to sheep, goats are more capable of using cell wall rich and poor nitrogen forages
- Goats can retain water by reducing losses through faeces and urine.

Comparative feeding behavior and digestive physiology in goats and sheep

S. No.	Characteristics	Goats	Sheep
1.	Activity	Walk longer distance	Walk shorter distance
2.	Feeding pattern	Browser, selective	Grazer, less selective
3.	Variety in feed	preferential	Less preferential
4.	Salivary secretions	Greater	Lesser
5.	Recycling of urea in saliva	Greater	Lesser
6.	DMI for Meat	3% of BW	3% of BW
7.	DMI for lactation	4-6% of BW	3% of BW
8.	Digestion of coarse roughage	Higher	Less efficient
9.	Retention time	Longer	Shorter
10.	Water intake/unit DMI	Lower	Higher

FEEDING OF SHEEP

- Proper nutritional management is essential to exploit full genetic potential of the animal.
- Feed accounts for 55-60% in the total cost of rearing sheep.

Energy:

- Insufficient energy in the diet may limit the performance of sheep
- Energy deficiency may lead to
 - Cessation of growth
 - Loss of weight
 - Reduced fertility
 - Lowered milk production
 - Reduced wool quantity and quality
 - Increased mortality

- Factors affecting energy requirement
 - Size, age, growth, pregnancy, lactation
 - Environment
 - Shearing
 - Stress

Protein

- Protein deficiency may lead to
 - Poor growth
 - Poor muscular development
 - Loss of weight
 - Reproductive efficiency
 - Wool growth
- Sulfur containing AA Methionine is the first limiting AA followed by lysine and threonine
- Cystein can replace methionine for growth

Maintenance

- DCP: $2.97\text{g} / \text{kg } W^{0.75}$
- TDN: $27.3 \text{ g} / \text{kg } W^{0.75}$

Nutrient Requirement for Maintenance		
BW	DCP	TDN
20	28	258
40	48	434
60	65	588

- Minimum of 3% fat in sheep ration is essential
- Salt is added 0.5% of complete diet or 1% of concentrate mixture

Reproduction:

- Breeding ram and pregnant ewes (last 6 weeks) should be provided with 50% more nutrients than the maintenance needs.

Nutrient Requirement for Pregnancy		
BW (kg)	DCP (g)	TDN (g)
25	80	580
45	135	903
60	155	1121

Flushing:

- The practice of increasing the nutrient intake of ewes and improving body condition prior to and during breeding.
- In this 25% more nutrients above maintenance needs has to be given 2-3 weeks prior to breeding season

Milk Production:

- Although sheep's are not reared for milk production but it is essential for nutrition of lambs.
- Lactating sheep's need twice the maintenance requirement during first 2 months and 1.5 times for the remaining period.

BW (kg)	DCP (g)	TDN (g)
25	95	665
40	135	945
60	185	1280

Feed and Fodder for sheep

- Sheep is having special ability to survive on natural grasses, herbs, legumes, weeds, shrubs and farm wastes.
- They have a muzzle with a split upper lip with which they can pick up tiny blades of herbage
- They also helps them to glean grain lost at harvest time
- Sheep can also chew greens with less moisture.
- In monsoon good quality pasture are available but in dry season supplemental feeding of concentrate mixture is recommended

Common fodder relish by sheep

1. Berseem
(*Trifolium alexandrinum*)



2. Lucerne
(*Medicago sativa*)



3. Cowpea
(*Vigna unguiculata*)



4. Sunn hemp
(*Crotalaria juncea*)



System of rearing

- Extensive System
 - Intensive System
 - Semi Intensive
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- Animals are receiving sufficient nutrients or not through grazing can be determined by their body weight
 - If BW is maintained or slightly increased to a level of 20-30 g/day i.e. they are in maintenance

- If they are continually losing BW they need additional supplementation
- If ewes are gaining weight more rapidly we shd reduce grazing time.
- Rotational grazing system shd be followed

Feeding of Lambs (Birth to 90 days)

- Birth weight of lambs and kids ranges between 2-3 kg
- Development of lambs in first four months is faster than kids
- Most critical period of life is first 48 hrs
- If lamb is unable to nurse within half an hour after birth it shd be assisted to suckle to get an advantage of colostrum.

Creep feeding:

- Creep space in adult pan
- Practice of providing supplemental feed to nursing lambs is called creep feeding.
- Lambs is to fed creep feed from 10 days to 90 days (weaning age)
- It shd be given to promote growth and early rumen development
- Amount of creep feed consumed is inversely proportional to the ewes milk production.

Feeding Schedule:

- Lambs shd be allowed to suckle thrice a day upto one month and thereafter twice a day.
- From 10th day onwards we shd start creep feed to the lambs
- From 15th day gradually start sunnhemp hay (Coarse ground) shd be started
- This feeding lasts upto 90 days of age i.e. weaning

Bw (kg)	Concentrate mix (g/day)	Roughage* (g /day)	Remarks
12 -15	200	400	8 hrs grazing can be substituted in place of roughages
16 -25	250	600	8 hrs grazing can be substituted in place of roughages
26 -35	300	700	8 hrs grazing can be substituted in place of roughages

Composition of creep feed

- Maize: 40 parts
- GNC: 30 parts
- Wheat bran: 10 parts
- DORB: 12 parts DCP: 17%
- Molasses: 5 parts TDN: 73%
- MM: 2 parts
- Salt: 1 part
- Vit AD₃, B complex and antibiotic feed supplements

Examples of creep feed

Ingredients	I	II	III
Maize flour	67	50	30
Barley flour	-	17	-
Oat flour	-	-	37
Groundnut cake	10	10	10
Wheat bran	10	10	-
Rice polish	-	-	10
Fish meal	10	10	-
Meat meal	-	-	10
Mineral mixture	2	2	2
Sodium chloride	1	1	1

- With the feeding of this creep ration performance of lambs shd be as follows
- Avg wt. at weaning: 14 kg
- Avg daily gain: 130 g
- Total creep feed consumed: 12.7 kg/lamb
- Sunnhemp hay consumed: 3.5 kg/lamb
- At 90 days of age, about 300 g of creep mixture is consumed by a lamb
- It is better to keep the lambs in the stall for mutton production specially in the monsoon period because the animals do not relish to graze the wet grasses and are also prone to diseases.
- Free choice mineral blocks are to be provided in the sheds.
- Cross bred sheep attain 30 kg body weight by 6 months of age while, native breeds may take 9 months.

Feeding of growing: Finishing lambs from weaning to slaughter

- Extensive system doesn't fulfill the requirement
- Examples of concentrate mixture

Ing.	% comp.		Ing.	% comp.	
Maize/Jowar	25	CP- 13.0 % TDN- 70%	Maize/Jowar	30	CP- 13.0 % TDN- 70%
Wheat bran	32		GNC	20	
Gram Waste	26		DORB	40	
GNC	15		Molasses	8	
Mineral Mixture	1		Mineral Mixture	1	
Salt	1		Salt	1	

Feeding of pregnant Ewes during last 6 weeks of gestation

- Ewe need more energy, protein, mineral and vitamin
- But excessive energy intake results in fattening
- While low energy intake results in low birth weight, reduced viability of lambs,
- During pregnancy ewes should fed with sufficient good quality roughage like cereals fodder supplemented with concentrate mixture
- To observe the nutrient intake of ewes body weight is the critical parameter if BW is increasing 100g/d in smaller breed and 150g/d in larger breed

Feeding of Lactating/suckling ewes

- After birth proper of lamb and ewe care shd be taken
- Only a little grain mixture shd be given for first 2-3 days along with good quality fodder
- Gradually the feeding of ewes shd be increased upto 4% of BW (DMI)
- The feeding will be in relation to the amount of milk taken up by lamb
- Feeding of supplemental feeding of concentrate mixture shd gradually diminished at 8-10 weeks and can be stopped after 12-13 weeks of lambing i.e. at weaning.
- There after the ewes are maintained on grazing alone

Feeding for Wool production

- Wool is protein rich in sulfur containing amino acid cysteine
- Small quantities of selenium, copper, cobalt, iodine, iron etc are essential for wool growth.

NUTRIENT REQUIREMENT AND FEEDING OF GOATS

- Goats are reared for milk and meat production
- Some of the important breeds of goats
- Dual purpose: Jamunapari, Barbari, Sirohi
- Meat purpose: Black bengal
- Hair type: Angora, chegu (pashmina)
- Exotic dairy goats: Alpine and saanen
- Milk yield of goats varied from 60 lit to 250 lit /lactation of 120 days

Dry Matter Intake:

- DMI varies from 35-80 g/kg $W^{0.75}$ avg is 70 g (3.2% of BW)
- DMI for smaller breed is higher than that of larger breeds
- DMI varies according to energy density of the diet and the physical character of the roughage.
- DMI of goats is higher in comparison to large farm animals
- Meat goats: 3% of BW
- Dairy goats: 4-6% of BW
- DMI reduces with the advancement of pregnancy and increased after parturition and reach a maximum between 6-10 weeks of lactation

Maintenance:

- ICAR has taken $76 \text{ g/kg } W^{0.75}$ as DMI
- Nutrient requirement per kg metabolic body size are DCP 3.0g and TDN 30 g

BW (kg)	DMI (g)	DCP (g)	TDN (g)	Ca (g)	P (g)
15	500	23	240	1.1	0.7
25	730	34	350	1.6	1.1
35	940	44	450	2.1	1.4
45	1125	53	540	2.5	1.7
55	1315	62	630	2.9	1.9

Ranjhan, 1998

Pregnancy and Lactation

1. For pregnancy:

- DMI- $92 \text{ g/kg } W^{0.75}$
- DCP requirement - $5.5 \text{ g/kg } W^{0.75}$
- TDN requirement is $50.5 \text{ g /kg } W^{0.75}$

BW (kg)	DMI (g)	DCP (g)	TDN (g)	Ca (g)	P (g)
15	700	42	385	2.1	1.4
25	1025	62	564	3.1	2.1
35	1320	80	725	4.0	2.7
45	1590	96	875	4.8	3.2
55	1850	112	1018	5.5	3.7

2. For Lactation

- DCP requirement - 45 g/kg FCM
- TDN requirement is 345 g /kg FCM
- FCM (3.5% fat): $[(0.35 \times \text{kg of milk}) + (18.57 \times \text{kg of fat})]$

BW (kg)	Milk Yield (kg)	DMI (g)	DCP (g)	TDN (g)	Ca (g)	P (g)
25	0.5	968	56	523	4.8	3.2
	1.0	1290	79	695	6.4	4.3
35	0.5	1155	66	623	5.8	3.9
	1.0	1470	89	795	7.3	4.9
45	0.5	1320	75	713	6.6	4.4
	1.0	1640	98	885	8.2	5.3
55	0.5	1490	84	803	7.4	4.9
	1.0	1805	107	975	9.0	6.0

Growth:

BW (kg)	ADG (g)	DMI (g)	DCP (g)	TDN (g)	Ca (g)	P (g)
15	50	510	33	330	2.7	1.8
	100	645	43	420	3.5	2.3
	150	785	53	510	4.2	2.8
25	50	760	44	440	3.8	2.5
	100	915	54	530	4.6	3.0
	150	1070	64	620	5.3	3.6

Ranjhan, 1998

Feeding of Goats

- Goats are browser and prefer tender leaves of herbs, shrubs and small trees
- Prehensile tongue and movable upper lip
- Goat is acknowledge as a mobile pruning machine that trim bushy shrubs
- Goat under field condition perform better but there intake gradually reduces as the fodder matures
- But this effect can be overcome by using processing methods
- Goats are less sensitive to tannins than cattle and other ruminants bcoz they produce “PRP’s”

Common Feed and Fodders

Tree Leaves

Babul



Subabul



Mango, Pipal,
Neem

Grasses

Para



Guinea grass



Legume Fodders	Berseem, Lucern, Cowpea
Cereal fodder	Maize, Jowar, Oats
Dry Feed	Cereal Straw, Legume Straw, gram husk

Feeding Of Kids

- They shd allow to suckle its dam for first 3-4 days
- Colostrum feeding is the main factor in kids viability
- Three factors responsible for effectiveness of colostrum:
 - Antibody concentration
 - Amount of colostrum intake
 - Time of consumption in relation to birth
- Cow colostrum is also effective for lambs and kids
- It shd be given at the rate of 100 ml/kg live wt
- Non descript goats produces 0.3-0.4 kg milk/day

- Kids start nibbling the grasses from 15day of age therefore creep ration can also be started

Feeding Schedule for a kid from birth to 90 days

Age of Kid	Milk (ml)	Creep Feed (g)	Forage, green /day (g)
1-3 d	Colostrum 300 ml in 3 feeding	-	-
4-14 d	350 ml in 3 feeding	-	-
15-30 d	350 ml in 3 feeding	A little	A little
31-60 d	400 ml in 2 feeding	100-150	Free Choice
61-90 d	200 ml in 3 feeding	200-250	Free Choice

- Creep ration of 18% CP and 75 % TDN shd be given
- Leguminous fodder + 12% CP & 70 % TDN Creep ration