LIVESTOCK FEEDS AND FEEDING

Nutrient- The chemical substances found in feed materials are necessary for the maintenance , production and health of animals.
Nurish- To feed an animal with substances necessary to life and growth.
Diet- Diet is the prescribed schedule of feed. A regulated selection of a feed ingredient of mixture of ingredients including water which is consumed by animals on a prescribed schedule.
Balanced diet- A balanced diet supplies all nutrients needed for normal health and productive functions.
Food: which is used in human diet.
Feed: which is used in animal ration.
Fodder: The roughage, which is cultivated for animal feed.
Forage: Natural or cultivated green grasses.

CLASSIFICATION OF LIVESTOCK FEEDS:

1. Roughage Feeds:

Roughage: Roughage are bulky feeds containing large amount of crude fibre (CF) more than 18% and low (about 60%) in T.D.N. on air dry basis. eg, straw, grass, fodder etc.

A. Succulent or Green

i) Non-legume Fodders -Maize, Napier, Para, Bajra, Guinea, German, Jowar, Sorghum, Oats, Barley, Sudan grass etc.
Tree Leaves - Jack-fruit, Bamboo, Mander, Banana , Gigha etc.
ii) Legume Fodders- Cowpea, Khesari, Motor, Maticali, Dhancha, Berseem, Alfalfa or Lucern etc.
iii) silage-Succulent processed fodder maize, napier, para etc.
Tree Leaves- Ipil-Ipil, Bubla etc.

B Dry roughage

Straw (Non-legume): Rice, Wheat, Barley, Jowar, Maize
Straw (Legume): Khesari, Maticali, Motor, Cowpea etc.
Hay (Legume): Khesari, Maticali, Motor, Cowpea, Berseem
Hay (Non - Legume): Sorghum, Jowar, and Oats.

2. Concentrate Feeds:

Concentrate: Concentrates are feeds which contain small amount of CF (less than 18%) and high (more than 60%) in T.D.N. on air dry basis. eg. grain, oil cake, fish meal etc.

A. Animal origin -
Fishmeal, Blood meal, Meat Offal, Meat Meal, Feather meal, Hatchery by product meal, Surplus milk etc.
B. Plant origin -
Products: Maize, Wheat, Barley, Oats, Sorghum, Bajra, Khesari, Maticali, Sweet potato etc.
By - products: Rice bran, Wheat Bran, Corn flower, Wheat flower, Bran of Khesari and Maticali, Molasses, oil cake etc.

3. Mineral supplements: Oyster shell, Bone meal, Egg shell, Lime stone, Chalk powder, Common salt, Vitamin-mineral premix etc.
4. Vitamin supplements: All leafy vegetables, Yellow corn, Fish liver oil, Vitamin-mineral premix etc.
5. Feed Additives: Antibiotics, Hormones, Coloring Materials, Flavoring agents etc.


Rice straw


Maize


Wheat


Til oil Cake


Fish meal


Oystershell


Bone meal

COMPONENTS OF FOOD:

1. Water
2. Dry matter
    a. organic
        i) carbohydrate
        ii) protein
        iii) fat
        iv) vitamins
    b. inorganic
        i) minerals

ESSENTIAL FEED NUTRIENTS:

Carbohydrate, protein, fat, minerals, vitamins and water etc which are essential for growth, maintenance, production and reproduction of a man or animal.

FUNCTIONS OF ESSENTIAL FEED NUTRIENTS:

Water:

- *Sources:* Metabolic water and drinking water
- *Requirement of water:*
    1. Poultry (adult)-0.20 liter/day
    2. Dairy cow- 40 liter /day
    3. Dry cow- 30 liter /day
    4. Bullock- 30 liter /day
    5. Sheep and goat- 0.5-1 Liter/d
    6. Horse-45 liter /day
- *Function:*

1. Cell rigidity and elasticity
2. Solvent action
3. Lubrication
4. Hydrolytic reactions
5. Ionic reaction
6. Transportation
7. Heat regulation
8. Respiration function

Carbohydrate:

1. Energy supply
2. Glycogen stored in liver and use in starvation
3. Maintain body temperature
4. Lactose helps to develop brain cell (lactose found in milk & it is known as milk sugar)
   (firstly CHO is used for energy supply in the body, if any kind of CHO deficiency occurs in the body then fat is used for energy supply, when CHO and fat both are deficit in the body then energy is produced from the protein)

Protein:

1. Build up body tissue
2. Repair of body tissue
3. Synthesis hormone and enzyme
4. Feathers, nail, hair and wool formation
5. Energy supply (CHO and fat deficiency)
   (animal protein is high quality than plant protein, because animal protein contains all essential amino acids and it is also efficiently utilized)

Fats:

1. Energy supply (It gives 2.25 times more energy than CHO and protein)
2. Skin smooth and oily
3. Flavor and palatability
4. It carries fat soluble vitamin (A,D,E,K)
5. Reserved under the skin and utilizes during starvation
   (excess CHO and protein converted into body fat)

Minerals:

1. Bone and teeth formation
2. Blood cells contain a small amount of minerals for the normal function of blood cells.
3. Maintenance of ionic equilibrium and osmotic pressure.
4. Maintenance of acid-base equilibrium.
5. Minerals are directly related to the structure and functions of membranes.
6. Minerals are also found as structural components of some hormones
7. It actives the enzymes.

Vitamins:

►Fat soluble vitamins:

Vit-A: Prevent xerophthalmia or night blindness. It helps eye vision.

Vit-D: It helps to absorption of Ca from the intestine for bone and teeth formation.

Vit-E: It helps in reproduction.

Vit-K: It helps to clot blood.

►Water soluble vitamins:

Vit-B Complex: Prevent anemia, helps growth and metabolism.

Vit-C: It is essential for the collagen formation (found in the gums) and prevents scurvy.

ONE GRAM NUTRIENT SUPPLIES:

1g nutrient	*Energy (Kcal)*
CHO	4
Protein	4
Fat	9

No energy is produced from water, vitamin and mineral

Ration: A ration is the feed allowed for a given animal during a day of 24 hours. The feed may be given at a time or in portions at intervals. It may or may not be balanced.

Balanced ration: Ration which provides the essential nutrients to the animal in such proportion and amounts that an animal requires according to its age, purpose and condition.

Total Digestible Nutrients (TDN): TDN is the sum total of all digestible organic nutrients where fat % is multiplied by 2.25. TDN indicates the relative energy value of a feed to an animal. It is ordinarily expressed in pounds or kilograms or in percent.
TDN= % DCP (digestible crud protein) + % DCF (digestible crud fibre) + % DNFE (digestible nitrogen free extract) + % DEE (digestible ether extract) X 2.25

Digestible protein (DP): The protein, which is digested in the stomach and absorbed from the small intestine, is known as DP.

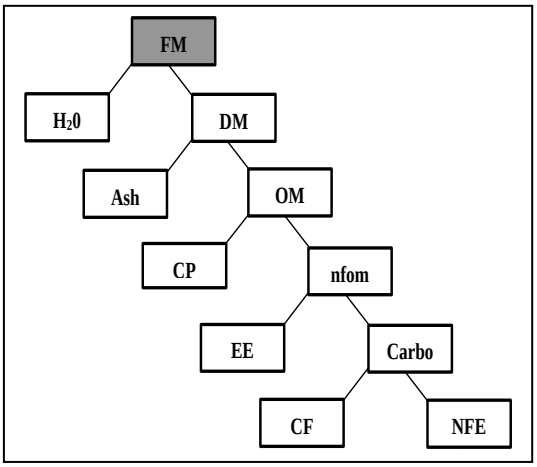
DP= Feed protein - Fecal protein

Silage: Fermented ensiling condition of green fodder, which is preserved in silo-pit, by anaerobic condition. Its moisture content exists as it is.

Hay: Hay making is the most commonly method of conserving green fodder as dry condition. The aim in hay making is to reduce the moisture content (15 % moisture) of the green crop (at flowering stage) by sundry method.

REQUISITES OF GOOD QUALITY RATION FOR LIVESTOCK:

1. The ration should be properly balanced
2. The feed must be palatable
3. Variety of feed in the ration
4. The ration should contain enough mineral matter
5. The ration should be fairly laxative
6. The should be fairly bulky
7. Allow much of green fodder
8. Avoid sudden change in diet
9. The feed must be properly prepared
10. Good flavor in the ration
11. The ration should be highly digestible
12. It is free from larva of parasite, mold, fungus
13. Ration should be economic

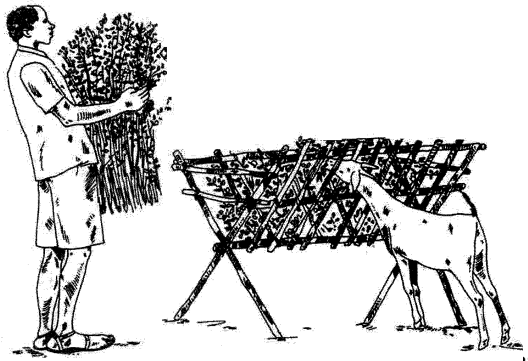


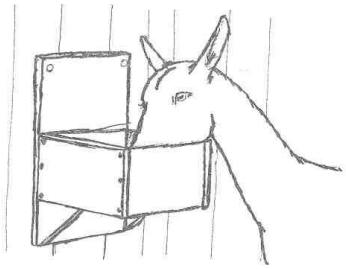
Feeding System of Livestock -
The farmers are supplying feeds to the animal in 3 systems.
1. Grazing 2. Tethering 3. Stall feeding
In Europe and America grazing and stall feeding methods are practiced. In our country we practice tethering and stall feeding.
1. Grazing: Sometimes animals are allowed in the grazing or pasture land to eat grass or fodders. The farm owner should be maintained different grazing system.
2. Tethering system: Sometimes animals are allowed to eat forage within a limited area. For this animal is tied with a tether by rope or chain.
3. Stall feeding: In stanchion housing this is the most common feeding system for animal. In this system cutting fodders or grasses and concentrate feeds are supplied in the manger.

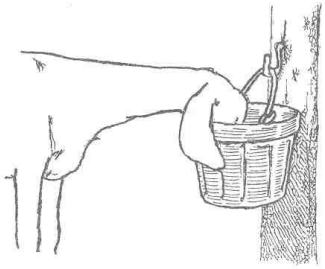
Feeding Schedule for dairy cow- Discussed in practical part of this course

Feeding schedule for kid and goat:

Body weight (kg)	Concentrate feed (g/d)	Green roughage (g/d)	Water
2.4-4.5	Mother milk is sufficient	-	-
4.5-9.0	50g for first 5 kg live weight and then 50g for next every one kg	adlibitum	adlibitum
9.0-30.0	350g	2-2.5kg or adlibitum	adlibitum
30.0-70.0	400-500g	5-6kg or adlibitum	adlibitum

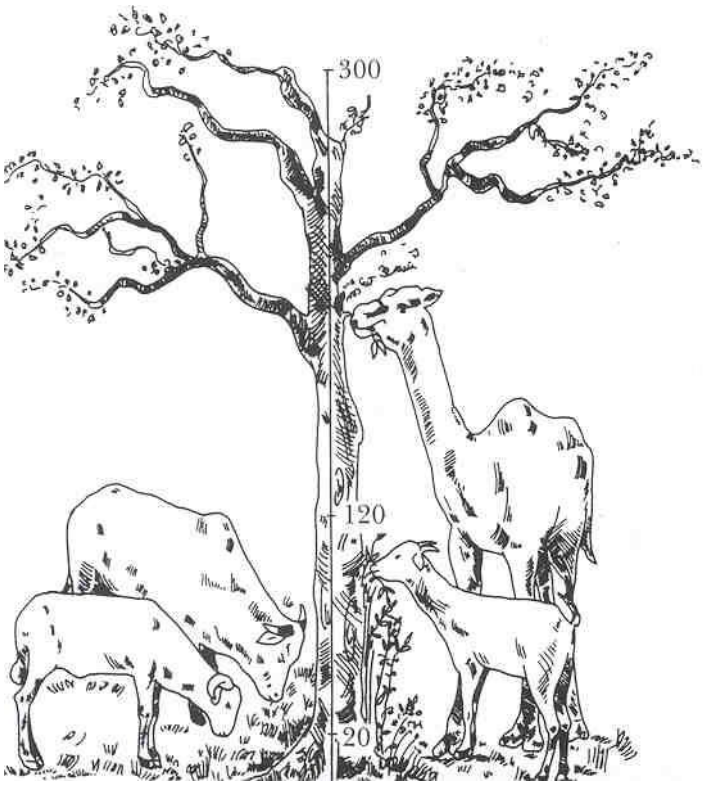






Concentrate feed for kid and goat according to purpose and age:

Ingredients	Concentrate feed for kid (%)	Concentrate feed for lactating doe(%)	Concentrate feed for fattening goat (%)	Concentrate feed for pregnant doe (%)
Gram	20	15	20	50
Wheat crust or maize crust	22	37	23	20
Til oil cake	35	25	30	20
Wheat bran	20	20	24	7
Mineral mixture	2.5	2.5	2.5	2.5
Common salt	0.5	0.5	0.5	0.5
Total	100	100	100	100



The goat being a ruminant is able to live and be productive on fibrous vegetation of relatively poor quality.

The goat is a natural browser, feeding by preference on tree leaves, flowers and seedpods, when it can.
Goats naturally prefer to eat at a height 20 - 120cm above the ground.

They can stand on their hind legs for long periods and even climb into trees in order to reach some particularly delicious part of the tree.

Feeding heights (in centimetres above the ground of sheep, goats, cattle and camels).