Class Notes	
Class: XI	**Topic: Principles of feeding −Feeding practices, Silage and Hay preparation.**
Subject: AGRICULTURE	

Principles of feeding

Milk feeding of calves

Calves are to be fed with milk at the rate of

- 1/10th of body weight up to 4th wks of age including the colostrums feeding from 0 – 5 day,
- 1/15th of body weight during 5th and 6th week. and
- 1/20th of body weight during 7 – 8th week.

The milk is to be warmed up to the body temperature before feeding and should be discontinued after 8th week. The calf starter provided at the rate of 300 gm per day starting from 2nd week of age and increased @ 200 gm / week till it becomes 1.5 kg per calf per day.

Feeding Milch Animals

- Soon after calving the animal must be fed laxative feed and warm gruel for first few days. The animal at this time must be managed separately. Special care may be taken regarding emptying the udder as frequent emptying may result in occurrence of milk fever especially in high yielding animals and those poorly managed during previous dry period.
- Feeding management during early postpartum must focus on attaining higher peak milk production and better persistency. This could be achieved by: i. feeding the animal with higher energy diets and ii. Maximizing dry matter intake
- A combination of leguminous and non-leguminous fodders is best to meet the maintenance and production requirement of a cow weighing 400 g and yielding up to 8 liters of milk. With only 1 g concentrate supplementation. Non leguminous fodder feeding would necessitate additional half-g concentrate supplementation. Same cow if fed on hay would need proportionality higher quantities of concentrates 2.5 and 4.5 g respectively.
- In case of dairy cows producing higher quantities of milk (>20 liters/days), no suitable combination of concentrates and fodders (even at high intake levels) can sustain this level of production without the mobilization of body reserves. Such cows can also be supplemented with oils/fats in their diets at 300 g per day level.
- Moderate levels of milk can be sustained on a suitable combination of green and dry fodders supplemented with desired amounts of concentrates. While feeding a mixture of straw and green fodders, it will be desirable if 1 kg of straw is mixed with every 4-5 kg of chaffed green fodder for each 100 kg body weight.
- If plenty of quality green fodder is not available and the ration is based on low quality straws/stovers then additional concentrate feeding is required. The feed intake of moderate yielding lactating dairy cows in dry matter equivalent is about 2.5 kg dry matter per 100 kg body weight. The dry matter intake in high yielding animals could go up to 3.5 percent or higher.
- In case of non-producing adult cows, dry matter requirement is about 2.0 percent of their body weight.
- For optimum results the protein requirement of total ration should be adjusted at 13-14 percent level. Leguminous fodder (like berseem, Lucerne) contain about 12-14 percent crude protein, non-leguminous fodder (like maize, sorghum, oats and grasses etc) contain about 7-8 percent protein. Straws like wheat and paddy straws contain only 3-4 percent crude protein. The crude protein content of the concentrate mixture should be so adjusted to provide about 13-14 percent crude protein in total ration.

Feeding of mature bulls

Concentrate is provided to the bulls to the tune of 2.0 to 2.5 kg per bull during morning hours. Seasonal green fodder such as maize, cowpea, berseem, jowar etc. depending on their availability, along with mixture of maize and oat silage during lean period was fed *ad lib.* to the animals. The bulls have free access to clean drinking water throughout the day. When energy intake is restricted, growth rate is decreased, testis growth is retarded, age at puberty is increased and sperm output is decreased. The bulls should be fed such that they are neither lean nor obese.

Over feeding or under feeding results in reduced libido.

Adult bulls should consume 2.0 to 3.0 percent dry matter.

- Concentrate: 2-3 kg.
- Quality green grass: 25-30 kg.
- Dry roughage: 3-4 kg.
- Vitamin A supplementation during lean season.
- Supplementation of mineral mixture and salt.
- Mineral mixture should be supplemented as follows:

1. 50 g mineral mixture for bulls up to 200 kg body weight
2. 70 g mineral mixture for bulls between 200 to 350 kg body weights.
3. 100 g mineral mixture for bulls above 350 kg body weight

Hay and silage preparation methods

Hay

The forages like grasses and legumes that have been cut, and then dried under sunlight. It is used when there is shortage of forages. Hay making is preferred mode of conserving the food of all green forages.

Principle of Hay making:-

- Fast drying maximizes green color and palatability.
- The rapid drying is more suitable for hay making as it minimize the microbial growth.
- The basic principle is to reduce moisture content in order to inhibit the action of microbial enzymes.
- In order to store green crops in a stack the moisture content should be reduced to 15-20%.

Method of Hay Making:- There are two methods of hay making.

1. Traditional method
2. New mechanized technique

1. Traditional method:-

- Cut the crop, when easy to break the stem by hand.
- Dry the crop under sunlight in the field.
- Turn the forage before sunset or sunrise to avoid shattering of leaves.
- Then hang with a rope.
- Stack it by using 3 bamboos.

2.New mechanized technique:-

Moving:-To cut the grasses a machine is used which is called mower. It is the first step in making of hay. Mowing is done in the morning. It can be at the end of the day when the grass is drier. So that it can increase the energy level of the forage by capturing some of the sugars.

Tedding:- For spreading of hay tedding is done. Hay tedders have several orbital wheels that lift hay by a turn. Tedding is immediately after mowing to spread the swath. It may require a second tedding the next day to speed up the drying process. More tedding can shatter leaves of alfalfa.

Raking:- To collect the hay.Hay rake is used. When the hay has tedded and is nearly dry, it is ready to rake. Raking turns the hay one more time to ready to be baled. Hay is gathered loose and stacked without being baled first. Spontaneous combustion may occur if hay becomes wet while in storage.

Baling:- A baler is a machine that coiled the cut hay in to round shape. After cutting, drying and raking baling is done. Then should be hauled to a central location for storage. It depend on geography, region and climate. In this process hay is usually gathered in the form of bales.

Storage:- Hay can be stored under a roof when resources permit. It is frequently kept inside sheds and may be stacked inside a bale. Hay never exposed to any possible source of heat. Because dry hay and the dust it produces are highly flammable.

Silage

Fodder is packed in airtight condition to preserve its nutritional value, improve its quality and taste and to make it easily digestible. This is called silage or pickle of the fodder.

Principle of silage making:- In this process, green fodder is fermented through special bacteria which can survive without oxygen. The resulting fodder is rendered tasty and easily digestible for animals.

Process of Silage Making:- The preparation of good quality silage depends on ,Timely harvesting of fodder, Quantity of air in it at the time of packing and preservation method.In this process useful bacteria converts soluble starches into lactic acid. It decreases its acidic quality (pH) to 3.0-4.0, which stops the growth of harmful germs and makes the fodder safe for animal consumption. If moisture content is high in fodder, wheat straw or crushed cobs of maize can be added for silage making.

Types of crops suitable for silage making

Crops like:- maize, jowar, bajra, hybrid napier, oat are most suitable for silage making.

Leguminous crops like berseem, Lucerne, cowpea is not suitable, unless molasses are sprayed on these crops while filling silo pit. Best silage is prepared by maize.

Harvest at proper stage

- Crops at pre flowering to flowering stage should be harvested.
- Crops should not contain more than 75% moisture while silage making.
- Crops with hollow stems like maize, jowar, bajra, hybrid napier should be chaffed to an inch size to prevent trapping of air and spillage of silage.
- High moisture crops can be dried in sunshine for 4 hours to reduce moisture content by 15%. Some dry hay or straw 5-20% can also be added. If the crop is over ripe and too dry or it over dried, add water during packing silo.

Filling and sealing of the silo pit

- The filling should be rapid with proper pressing by use of tractor after each filling to remove air.
- Silo pit filling should be completed within 4-7 days.
- After thorough pressing, top should be covered with polythene followed by soil layer of 6 inches depth.
- Top of silo pit after filling and compressing should be higher than surrounding. Plug all possible areas of air or water entry.

Removing silage from pit

- Silage should be ready within a period of 2-3 week of sealing.
- Once opened the pit should be fed completely.
- Silage may be fed from top, layer by layer, daily.
- On exposure to air for longer period silage get spoiled. Hence, try to prevent entry of air.

Note: This content has been prepared at home.