CHAPTER 3

Common Feeds and Fodders Used in Dairy Animals

Objectives

- 1. To classify the feedstuffs in to different categories.
- 2. To know the energy and protein contents in commonly available feedstuffs.

Introduction

Feeds are generally classified according to the amount of a specific nutrient they furnish in the ration. The first broad grouping of feedstuffs is based on the bulkiness which is dependent on the content of crude fibre (CF) content. They are divided into 2 general groups: roughages and concentrates. Roughages could be green or dry. Concentrates could be further divided into energy and protein sources which may be of plant or animal origin. Mineral and vitamin supplements, feed additives are the part of feed formulation.

Classification of feeds

Feeds are generally classified according to the amount of a specific nutrient they furnish in the ration. The first broad grouping of feedstuffs is based on the bulkiness which is dependent on the content of CF. They are divided into 2 general groups: roughages and concentrates. Roughages are bulky feeds containing relatively large amount of bulky material i.e., CF more than 18%.low in TDN on dry matter (DM) basis. Concentrates are the feeds which contain less fibre (<18%) and more than 60% TDN.

The roughages may be dry or green/succulent. Dry roughages contain10-15% moisture while green roughages may contain 60-90% moisture. Dry roughages include straws (rice straw, wheat straw, hay etc.). Green roughages include cultivated fodders: 1.Leguminous-(berseem, lucerne, cowpea etc.) 2. Non-leguminous- (maize, jowar, bajra, oat, perennial grasses : napier hybrid, anjan grass, para grass, guinea grass etc.). Other examples of green roughages are- tuber crops (e.g. turnip, sugarbeet), vegetable/fruit wastes, tree leaves (subaool, ber, kachnar, babool etc.), silage etc.

The roughages could also be grouped on the basis of their capacity to supply nutrients as given in the Table 3.1.

Table 3	3.	1
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Digestible crude protein (DCP) level	Category
<3%	Non-maintenance type. e.g. rice straw, wheat straw
3-5%	Maintenance type. e.g. green maize, oat
>5%	Productive type. e.g. berseem, Lucerne, cowpea



Fig. 3.1: Flow diagram of classification of feedstuffs

Common name	Botanical name
A. Cultivated green fodders	
1. Leguminous	
Berseem	Trifolium alexandrinum
Lucerne	Madicago sativa
Cowpea	Vigna sinensis
2. Non-leguminous	
a) Annual	
Maize	Zea mays
Sorghum	Sorghum bicolor
Bajra/pearl millet	Hordeum vulgare
Oats	Avena sativa
b) Perennial	
Hybrid napier	Pennisetum purpureum x P. americanum/typhoides
Guinea grass	Panicum maximum
Rye grass	Lolium perenne
Para grass	Brachiaria mutica
Anjan grass	Cenchrus ciliaris
3. Non-leguminous non graminaceous	
Chinese cabbage	Brassica pekinensis
B. Tree.shrub	
Subabool	Leucaena leucocephala
Ber	Zizyphus jujuba or Zizyphus mauritiana
C. Dry fodder	
Rice/paddy straw	Oryza sativa
Wheat straw	Triticum aestivum

Table 3.2. Botanical names of various feedstuffs

The concentrate feeds are broadly divided into 2 categories. A. Energy rich- these are high in energy and low in fibre (<18% CF) and usually contain <20% CP. Examples aregrains (maize, wheat, oat, barley, bajra), grain byproducts (wheat bran, rice bran, rice polish), dried tubers (tapioca, sweet potato, potato), molasses etc. **B. Protein rich-** products either of plant origin (ground nut cake, cotton seed cake, mustard cake, soybean cake, til cake) or animal origin (fish meal, meat meal) containing >20% CP.

Feed supplements and additives

The BIS has given the composition of mineral mixture for cattle and poultry. Mineral supplementation is necessary for better milk production, reproduction and health. Likewise vitamin supplements are necessary under certain situations. Feed additives are also used for improvement in health and production of dairy animals. These are antibiotics, probiotics, prebiotics, enzyme preparations, anabolics etc. These are to be given in the diet in very minute amounts.

Non-conventional feed resources (NCFR): The use of NCFR is very important in augmentation of feed resource base as India is facing feed deficit. Some of the unconventional feeds used in India include vegetable protein sources (guar cake, niger cake, karanja cake, neem cake rubber seed cake, cassia tora seeds etc.), animal protein sources (hatchery waste, liver residue waste, dried poultry manure, crab meal, hydrolysed poultry feather etc.), energy sources (sal seed meal, cassava roots, tapioca starch waste, tamarind seed powder, oak kernel, mango seed kernel etc) and other miscellaneous feeds (babul poda, sea weed meal, jack fruit waste, sugar cane bagasse, sugar beet pulp).

FEED	CP (%)	TDN (%)
A. Roughages		
1. Green		
Berseem	18	62
Lucerne	18	60
Cowpea	20	62
Maize	9	60
Sorghum	7	55
Bajra	8	58
Oat	10	62
2. Dry		
Wheat straw	3	40
Paddy straw	4	45
B. Concentrate		
1.Energy sources		
Maize grain	11	84

Table 3.3. Protein and energy contents of commonly used feeds and fodders

Wheat grain	10	75
Broken rice	9	75
Sorghum grain	9	80
Bajra	11	75
Barley	10	70
Wheat bran	15	65
Rice bran (deoiled)	12	65
2. Protein sources		
Ground nut cake	45	78
Mustard cake	35	80
Soybean cake	50	65
Cotton seed cake	38	76

Review Questions

- 1. Differentiate between roughages and concentrates. Give examples.
- 2. Enumerate green and dry roughages.
- 3. What ore non conventional feed resources?
- 4. Write down CP and TDN values of green fodders (maize, sorghum, berseem and cowpea) and dry fodders (wheat straw and paddy straw).