PRACTICAL MANUAL
AHDS- 364

EXERCISE NO. 1

BODY PART OF SHEEP AND GOAT

A) Body part of sheep (Mutton type)

1) Objective: The study of external anatomy is useful in the following.

1. Study of breed characteristics.
2. Judging of animals.
3. Locating the external abnormalities on body.
4. Writing report of treatment, dressing of parts etc.

2) Relevant information

It is essential to study the external parts of animals to distinguish the species, breed and individual phenotype. The study of body parts helps for identifying the individuals phenotype and also in carrying out scientific studies related to growth and development of animals. The study also helps in assessing defective body parts if any. Thorough knowledge of body requires knowledge about body parts. Placement of differentiating characters becomes easy when the person know the body parts.

4) Precautions:

Be careful and cautious while approaching the animal.

Carefully restrain the animal before handling

Do not excite the animal

Beware of the vices of the animals.

Material Required:

A live specimen of seep/goat.

Ropes, crate, peg, measuring tape

Green fodder.

Photographs/charts/models /slides/live specimen of sheep and goat.

Procedure:

1. Tie the animal with the help of rope to a peg.
2. Allow some green fodder to it.
3. Hold the animal with the help of attendant.
4. Take the guidelines of teacher for identifying and locating the different body parts of sheep or goat.
5. The student will memories the body parts of the animal.

A) Body parts of Sheep:

The animal body has generally four regions. I.e. 1) Head 2) Neck 3) Body and 4) Quarter Region (A) Fore quarter (B) Hind quarter.

Head region	Neck region	Quarter Region	
		Four quarters	Hind quarters
Horns	Neck	Shoulder	Sacrum
Head crest	Neck crest	Shoulder Blade	Rump
Face	**Body region**	Arms	Pin bone
Fore head	Back	Fore arms	Thigh
Nostrils	Loin	Knee joint	Tail
Muzzle	Hollow of Flank	Shank	Milk Vein
Muffle	Hip bone	Pastern	Milk Mirror
Mouth	Chest	Fetlock	Udder
Eyes	Abdomen	Coronet	Teats
Cheeks	Ribs	Hooves	Vagina
Ears	Belly	Dew Claw	Vulva Scrotum Sheath

Observations:

1 Draw sketch and label the parts looking of body of animal

2 Mark different wedges on the body of the animal.

3 Measure the body length, girth and height of the animal with the help of measuring tape.

B) Body parts of Goat:

The body of a goat is divided into four regions i.e. Head, Neck, Body & Quarter region.

Head	Body region	Neck region	Quarter	
			Fore quarter	Hind quarter
Horns	back	Neck	Shoulder	Thigh
Head crest	Lion	Neck Crest	Fore arm	Hock joint
Poll	hollow of the flank		Knee joint	shank
Face	Hip bone		Shank	Pastern
Forehead	Rump		Pastern	Dew claw
Eyes	Tail		Dew claw	Hoof
Muzzle	Pin bone Sacrum		Hoof	
Nostrils	Anus			
Mouth	Vulva			
Cheeks	Chest			
Ears	Abdomen			
	Udder			
	Teats			

Question:

1 Draw a neat sketch of sheep/goat body and labeled the various body parts.

2 State the point of difference in respect of body parts of sheep and goats.

EXERCISE NO. 1 B

STUDY OF BODY PART OF POULTRY

Objective: 1) Knowledge of the different body parts of a fowl is essential in understanding the description of different breeds of poultry

2) To know the shape and depth of body of various types of poultry breeds i.e. egg type, meat type, dual purpose

3) To differentiate sex in poultry by observing body parts.

Relevant Information:

The fowl comes under the

Class:	Aves
Family:	Phasianidae
Genus:	Gallus
Species:	Domasticus
Common Name:	Fowl
Chromosomes (2n):	78

The domestic fowl possess feathers. The feathers are characteristics feather of this class. There are two types 1. Running birds 2. Flying birds

Material required:

1. Live specimen 2. Charts 3. Models

Precautions:

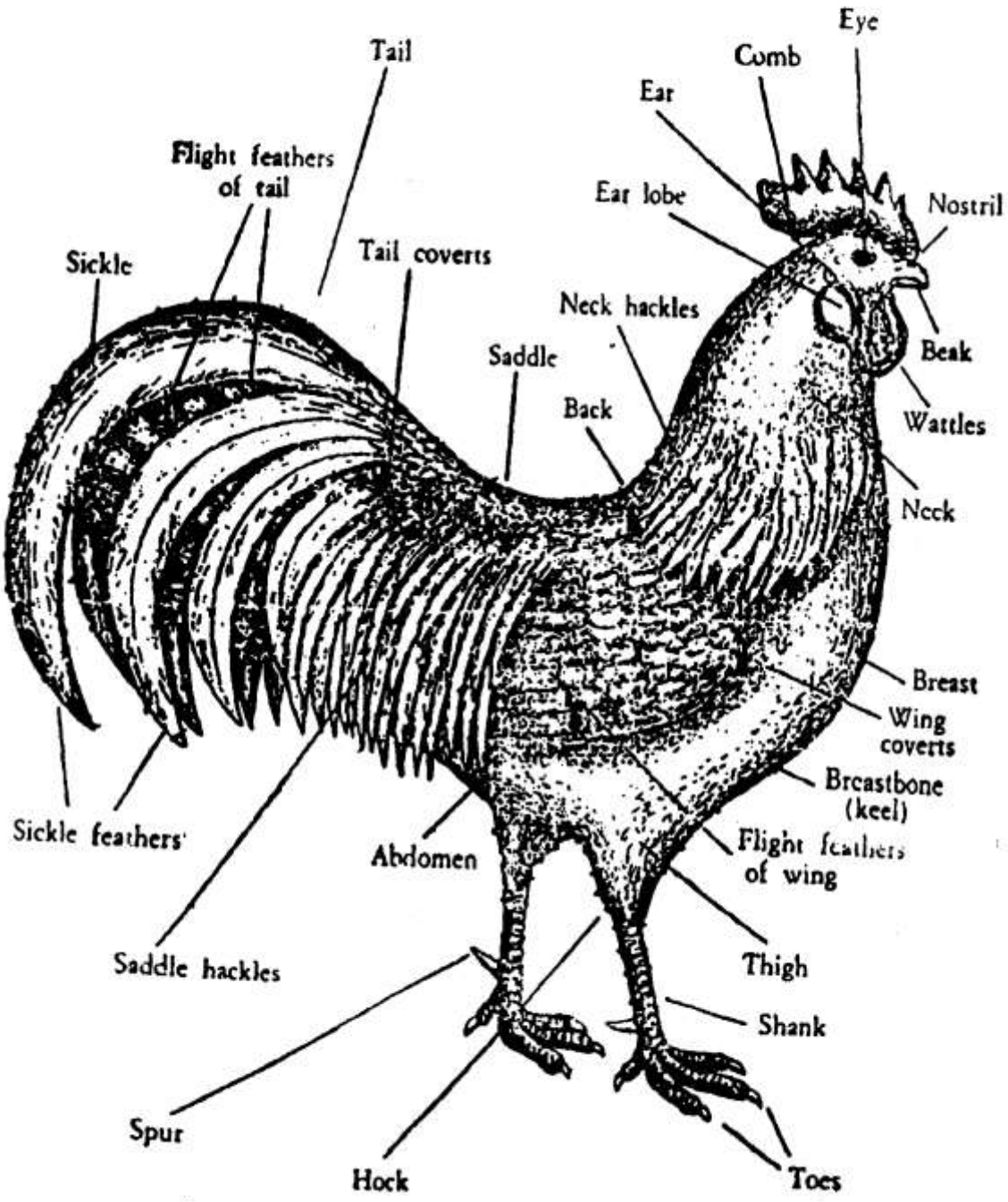
Handle the birds carefully. Hold the bird with its chest on your palm close to your body. The legs should be gripped in between two fingers.

Procedure: The body of fowl comprises of

i) Head	**ii) Neck**	**iii) Trunk**
1. Comb		1. Chest
2. Back		2. Wings
3. Nostrils		3. Thighs
4. Face		4. Shank
5. Wattle		5. Spur
6. Eyes		6. Claw
7. Ears		7. Toe
		8. Fluff
		9. Saddle feathers
		10. Sickles

11. Back
12. Vent

EXTERNAL PARTS OF FOWL



I) Head: It is the anterior extremity of the body all these sense organs are situated in this region.

1. Comb: It is the fleshy outgrowth of the top of the skull. Size is large in males. They are single, rose, pea comb etc. types.

2. Beak: It is the horny outgrowth from the mouth consisting of upper and lower mandibles.

3. Nostrils: Two openings on the upper mandible and are in continuation with pharynx.

4. Face: Portion of the head around the eyes up to the nostrils.

5. Wattle: It is the fleshy outgrowth from the lower mandible. Comparatively, large in males. Deep red in colour.

6. Eyes: On both sides of head.

7. Ears: Two openings (not external ear) covered with tufts of feathers and possess ear lobes.

II) Neck: The cervical portion is called as neck. It comprises pharynx (sound box), windpipe and oesophegus. It connects the head with body or trunk.

III) Trunk:

1. Chest: The front portion of the body is called chest.

2. Wings: These are modifications of forelimbs. Helps in flying of bird.

3. Thighs: Muscular part of leg above shank is thigh. It gives strength to the bird.

4. Shank: The portion leg just below the thigh is shank.

5. Spur: A hard projection like structure at the lower end of shank is a spur. Present in male (prominent) and absent (rudimentary) in female.

6. Claw: This is the portion consisting of digits. Such digit has a nail and is used during fighting or emergency.

7. Toe: Helps the positioning of the leg on the ground.

8. Fluff: Small and soft feathers existing on the lower portion of the body is called fluff.

9. Saddle feathers: These are long prominent feathers in the saddle region (back portion).

10. Sickles: Feathers located at the posterior end, which forms the back out line of the bird, is known as sickle. Quite long in male. In female feather of tail is not sickle shape.

11. Back: Upper hand portion of body is back. It is coloured and contour like part of body.

12. Vent: External opening of the digestive system.

Observation:

i) Draw diagram of fowl and level body parts.

ii) Draw separate male and female figures.

EXERCISE 2

Title: Differences between of sheep and goat.

1. **Objectives:** To study the different between sheep and goat in respect of general, physical and reproductive characteristics.
2. **Material required**: Live specimen of sheep and goat
3. **Procedure:**

	Characteristic	Sheep	Goat
A	**General**		
1	Chromosome number (2n)	54	60
2	Domestication before (Year)	6000-7000	8000-9000
3	Population in India (million)	74.14	148.88
4	Population in Maharashtra (million)	2.70	10.60
5	Annual Growth rate (%)	2.34	3.40
6	No. of breeds in India	43	34
7	Position of India in the World's Total Population	3^{th}	2^{st}
8	Out of total livestock Contributed (%)	13.8	27.8
B	**Physical characteristics**		
7	Tail	Generally long hanging and fairly broad	Short, thin & upright position
8	Back & Withers	Round & Well fleshed	Sharp and little fleshed
9	Thorax	Barrel shaped	Flattened laterally.
10	Radius	1.25 times long as metacarpus	Twice as long as metacarpus.
11	Scapula (Triangular bone of the shoulder	Short & broad superior spine, bent back and thickened	Posses distinct neck, spine straight and narrow.

12	Sacrum (A thick triangular bone situated at the lower	Lateral borders thickened in form of rolls.	Lateral Borders thin & sharp.
13	Flesh	Pale red & fine in structure	Dark red & Coarse with goaty odour
14	Gen. Appearance	Fatty & mostly roundish type.	Taller, thinner & more angular.
15	Body covering	Wool, Coarse & hairy.	Hairy
16	Presence of bread	No beard or any odoriferous tail gland	Bearded & Strongly Odoriferous Tail glands of Male.
17	Face gland	Present	Absent
18	Foot glands in hind feet.	Present	Absent
19	Natural of horns.	Mostly/Homonymous	Heteronymous.

C) Reproductive Behaviour:

20	Onset of puberty	4-12 months	4-8 months.
21	Av. Age at first service	12-18 months	12-18 months
22	Length of estrous cycle.	14-20 days.	17-24 days.
23	Duration of estrus.	24-48 hours	16-50 hrs.
24	Gestation period	150 days.	150 days.
25	Time of ovulation	12-24 hrs after the onset of estrus	25-30 hrs after the onset of estrus.
26	Optimum time for	18-24 hrs after the onset of estrus.	12-20 hrs After the onset of estrus.
27	Advisable time to breed	Usually in next winter	80-90 days after parturition
28	Breeding life span	5 – 8 years	6-10 years.

4. **Observations:** Observe the live specimens of sheep and goat carefully and mark the physical difference.

5. Questions:

1. Enlist the general characteristics of sheep and goat.
2. Distinguish between sheep and goat in respect of physical.
3. Distinguish in respect of reproductive characteristics of sheep and Goat.

(Source: Text book of Animal Husbandry by G.C. Banerjee, 8th Edition)

EXERCISE NO. 3

Title:- Grazing habit of sheep and goat

1. **Objective**: To know the feeding and grazing behaviour of sheep and goat

2. **Relevant information:** Perform of sheep and goat depends on, how they are fed during the period of growth, pregnancy and lactation. Animals maintained for meat purpose will also perform according to what they are fed. Therefore, for planning the practical feeding plan of sheep and goat, one must be necessary to aware of their feeding habits, feeding standards and feeding problems.

   Material required: Grazing land, harvested fields, shrubs, bushes, tree leaves, straw etc. and live sheep and goat.

Procedure:

A) Grazing habit of sheep:

No other class of animals is so well adapted to the utilization of maximum quantities of pasture as sheep. Although cattle compete with sheep for many of the same grazing areas sheep are unique in their marked preference for short, fine forages and flocking instinct.

Sheep cannot thrive on one pasture continuously. They graze close to the ground. They do not need tall grown grasses, but need short grasses for grazing. They thrive very well on stubbles of kharif crops in winter and byproducts left after harvesting of agricultural crops. Sheep possess a unique ability to survive on natural grasses, shrubs and farm waste products like residues of the field crops. With their small muzzles and split upper lips, they can nibble tiny blades of vegetation which cannot be eaten by bigger animals. They are called as **natural weed killers.**

In traditional sheep rearing, practically very little or no supplementary feeding is provided to sheep. They have been maintained for efficient production through maximum output of pasture and natural lands. However, some supplementation of concentrate feed containing some grains and mostly agro industrial byproducts and conserved fodders may be necessary for increasing the mutton production.

Inadequate availability of feeds and forages due to reduction in area and deterioration of grazing lands, grazing of sheep is becoming a limiting factor. This has been the compelling reason for large scale migration of sheep for the sake of grazing.

The flock should graze on light soils in the morning and the fallows of heavier soils in the afternoon. During monsoon, flocks must move on to well - drained area of rainfall. The winter dew

on the grass is not healthy for sheep. Pods of acacia tree, wherever available are topped and fed as a part of concentrate feed. Sheep are not selective in its feeding habits, and they will eat whatever they get but it should be free from off flavour. They do not relish fodder like sorghum, maize silage or straws.

B) Grazing habits of goat:

By means of their mobile upper lips and very prehensile tongues goats are able to graze on very short grasses and browse on foliage not normally eaten by other domestic animals. Goats are very good climbers in addition to their browsing habit. They have selective feeding habit, accepting a wide variety of feed. Goats have higher tolerance for bitter taste than sheep. They consume certain species of grasses and tree leaves at definite stage of maturity and reject at mature stage. Goat can thrive on herbs when there is sparse food supply. They are browse forms an important part of the diet of goats. It is efficient in digesting the crude fibre part of the feed. Goat feed should be of tree leaves, shrubs and agro-byproducts after harvested crops.

For the size of goat it can consume substantially more feed than either cow or sheep. Goat do not graze close to the ground as like as sheep. They are fond of leguminous fodders. Goats have special mouth parts and are able to extract nutrition from the poorest of the waste land vegetation. They are browsing and thrive in the areas richer in bushy plants. They like to stand on their hind limbs and pluck the tender leafy twigs of herbs, shrubs and small leaves.

Out of all the domestic animals, goats have the wide range of adaptions. No other animal bas been known to withstand the vagaries of the harsh environments as goats to any extremes. The early domestication process (goat is considered to be one of the first animal domesticated by man) along with certain definite physiological characteristics are perhaps responsible for its better adaptability. The goat can eat feeds which normally are not consumed by cattle or sheep.

Goats are consume wide variety of feeds. They are contrary to popular opinion, fastidious in their feeding habits. Feed that is acceptable to one goat is some times not acceptable to another goat. They like fresh feeds and usually refuse feeds which have been soiled by other animals. Goats can distinguish between bitter, sweet, salty and sour taste and show a higher tolerance for bitter taste than cattle. They like variety in their feed and do not thrive well when kept on a single type of feed for longer period. The feeding habits of grazing goats vary not only with the ecology but also with the season of the year in same locality.

Goat can take 80% of total intake as browse however, where browse is not available, goats are quite capable of utilizing grasses and other crop residue much as cereal straws and stovers.

What type of feed does goat like?

In the tropics areas, goats commonly feed on tree leaves particularly in the humid region. Farmers provide topped tree leaves in addition to grazing. This common management practice is advantageous because it adds variety to the diet and helps to meet the nutrient requirements for maintenance and production. In rural areas this practice is followed on large scale. When pastures are grown, legumes should also be included to increase the nutritive value of the forage. The important legumes crops which can be grown and fed to the goats in tropics include stylo, siratro, berseem, Lucerne etc. Variety of grasses can be grown. In general goats prefer less coarse grasses such as Guinea grass than coarse type (elephant grass).

Observations:

1. Allow the sheep/goats to graze/ browse and observe their grazing/browsing habit.
2. Supply straw/green fodder to the sheep/goat and observe feed intake under stall fed condition.
3. Compare feed intake during grazing and in stall fed condition.

Question:

1. Write in brief about the grazing habits of sheep/goat.
2. Write the feeding practices followed in rural area for goats.
3. Compare and differentiate between grazing of sheep and goat.
4. Write the of feed and fodder fond by sheep and goat.

EXERCISE NO. 4

Selection of Sheep and Goat

1. Objectives: 1. To establish a flock of sheep which gives economic production of wool and meat.

2. To establish a flock of goat which gives economic production of milk and meat.

2. Relevant Information:

Selection may be defined as differential reproduction i.e. different kinds of parents are allowed to produce more or less offspring's. The ultimate objective in selection is to increase the frequency of desired genes in the population for the traits under consideration. Real selection yields immediate returns since only the best animals remain in the flock to consume available feed supplies.

Many factors need to be considered for establishment of the successful sheep or goat farm. These animals are maintained primarily for the production of milk, meat and wool. Each individual breeding animal in the flock should be selected on the basis of efficiency in producing these products, for this purpose the owner should continually take efforts to improve his flock through better breeding and selection.

Indian Sheep breeds in different Agro-Ecological regions

I) Northern temperate region

1.	Gaddi	Kashmir, Himachal Pradesh
2.	Rampur Bushair	Uttar Pradesh, Himachal Pradesh
3	Bhakarwal	No distinct home
4	Karnah	Kashmir
5	Gurez	Kashmir
6	Kashmir Merino	-
7	Changthangi	Kashmir
8	Poonchi	Kashmir

II) North Western Arid and Semi – arid Region

09	Chokla	Rajasthan
10	Nali	Rajasthan, Haryana
11	Marwari	Rajasthan
12	Jaisalmeri	Rajasthan

13	Pugal	Rajasthan
14	Malpura	Rajasthan
15	Sonadi	Rajasthan, Gujarat
16	Pattanwadi	Gujarat
17	Muzaffarnagri	Uttar Pradesh, Delhi, Haryana.
18	Jalauni	Uttar Pradesh
19	Hissardale	Uttar Pradesh
20	Magra	Rajasthan
21	Panchali	Gujarat
III)	**Southern Region**	
22	Deccani	Maharashtra, Andhra Pradesh, Karnataka
23	Nellor	Andhra Pradesh
24	Bellari	Karnataka
25	Hassan	Karnataka
26	Mandya	Karnataka
27	Mecheri	Tamil Nadu
28	Kilakarsal	Tamil Nadu
29	Vembur	Tamil Nadu
30	Coimbatore	Kerala, Karnataka
31	Nilgiri	Tamil Nadu
32	Rananand White	Tamil Nadu
33	Madras Red	Tamil Nadu
34	Tiruchy Black	Tamil Nadu
35	Kenguri	Karnataka
36	Chevaadu	Tamil Nadu
IV)	**Eastern Region**	
37	Chotanagpur	Bihar and West Bengal
38	Balanagar	Orissa
39	Ganjam	Orissa
40	Tibetan sheep	Arunachal Pradesh
41	Bonpala	Sikkim
42	Sahabadi	Bihar
43	Kendrapada	Orissa

Classification of 43 Indian Sheep Breeds according to their Major Function/Utility

Garments Wool	Carpet Wool	Meat and Carpet Wool	Meat
Kashmir Merino	Cholka	Muzzaafarnagri	Nellore
Nilgiri	Nali	Jalouni	Mandya
Hissardate	Pattawadi	Doccani	Hassan
Karnala	Tibetan Sheep	Belary	Mechari
	Gaddi	Ganjam	Kilakarsal
	Rampur Bushair	Balangir	Vembur
	Bhakarwal	Shahbadi	Ramanad white
	Poonchi	Chottanagpuri	Madras red
	Gurez	Coimbatore	Triuchy black
	Changthangi	Marvari	Kanguri
	Gaddi	Jaisalmari	Kendrapada
	Panchali	Pugal	
		Malpura	
		Sonadi	
		Boanpala	
		Chevaadu	

Thirty four Indian goat breeds

I) <u>Northen temperate region:</u>

1.	Gaddi	Himachal Pradesh & U.P.
2	Changthangi	Ladakh (above 4000 m)
3	Chegu	Himachal Pradesh & U.P.
4	Bhakarwali	Jammu & Kashmir

II) <u>North Western Arid & Semi- arid region</u>

5	Sirohi	Rajasthan & Gujarat
6	Marwari	Rajasthan & Gujarat
7	Jhakrna	Rajasthan
8	Beetal	Punjab & Haryana
9	Barbari	Uttar Pradesh and Rajasthan
10	Janunapuri	Uttar Pradesh
11	Rohilkhandi	Uttar Pradesh

12	Pantija	Uttarakhand, Utter Pradesh
13	Mehsana	Gujarat
14	Gohilwadi	Gujarat
15	Zalawadi	Gujarat
16	Surti	Gujarat
17	Kutchi	Gujarat
18	Kahmi	Gujarat
19	Teressa	Andaman & Nicobar

III) <u>southern Region</u>

20	sangamneri	Maharashtra
21	Osmanabadi	Maharashtra
22	Konkan Kanyal	Maharashtra
23	Berari	Maharashtra
24	Kanni-Adu	Tamil Nadu
25	Kodi Adu	Tamil Nadu
26	Solem Black	Tamil Nadu
27	Bidri	Karnataka
28	Nandidurga	Karnataka
29	Malabari	Kerala
30	Attapady	Kerala

IV) <u>Eastern Region</u>

31	Ganjam	Orissa
32	Black Bengal	W. Bengal, Assam, Manipur, Tripura, Arunachal Pradesh, Meghalaya.
33	Sumi Ne	Meghalaya
34	Assam Hill	Assam & Meghalaya

Temperate Himalayan region (includes the states of Jammu and Kashmir, Himachal Pradesh and hilly areas of Uttar Pradesh)	Northwestern region (States of Haryana, Punjab, Rajasthan, Gujarat, Plains of Uttar Pradesh and north and western parts of Madhya Pradesh)	Southern region (States of Maharashtra, Karnataka, Kerala, Tamil Nadu, Andhra Pradesh and parts of Madhya Pradesh)	Eastern region (States of Bihar, West Bengal, Odisha and all the states in the eastern part of the country)
Gaddi (long hair, meat and pack animal)	Jamunapari (meat and milk)	Sangamneri (meat and hair)	Ganjam (meat)
Changthangi (fibre, meat and pack animal)	Marwari (meat and hair)	Osmanabadi (meat and milk)	Bengal goat (meat)
Chegu (fibre)	Zalawadi (meat and hair) Beetal (meat and milk) Kutchi (meat and milk) Sirohi (meat and milk) Barbari (Meat and milk) Mehsana (milk and meat) Surti (meat and milk) Jakhrana (milk and meat) Gohilwadi (meat and milk)	Kannai Adu (meat) Malabari (meat and milk) Attappady Black (meat) Konkan Kanyal (meat) Berari (meat)	

Procedure: Selecting a breed

While selecting a breed of sheep or goat, following factors are considered.

1. Environmental condition under which the animals will thrive.
2. Market Price and demand for the principal product to be produced.
3. Cost and availability of breeding stock.
4. Availability of feed, fodder and water
5. Personal likes.

Selection of basic stock of sheep

- Keep in mind economy characters in sheep to be improved i.e. wool, mutton and milk and market demand for it.
- Decide the native breed to be kept considering topography, agro-climatic area, type of feed & pasture and adaptability of breed.
- It is always better to start with well recognized breed of the area.
- Have a clear-cut objective of sheep farm and adopt appropriate mating system.
- Decide about exotic breed to be introduced.

Selection of Rams:

- Purchase the ram from well reputed sheep breeder or Govt. farm.
- Exert special care in the selection of ram.
- Select Rams for good lineage, muscularity, vigour, wool covering and mutton qualities.
- See thoroughly the breed characteristics.
- Examine testicles properly which should be healthy, soft pliable, and free from any disease.
- Do not purchase cryptorchids or rams with small atrophied testicles.
- Go in for rams showing good libido.

- Get semen quality evaluated if possible.
- Purchase rams of 2 to 4 teeth age only.
- The animal should appear compact, blacky with straight top. Legs should be strong.
- Muzzle should be broad and square.
- Chest should be deep and good width.
- Back should be straight and strong.

Selection of ewes:

- See the breed characteristics properly
- Purchase only 2 to 4 teeth young ewes.
- Select for good constitution, well shaper body, robust frame and sturdy legs.
- Select for heavy fleece and its quality for fine wool production and stocky body for mutton production.
- Examine the udder properly and see that it is soft, pliable and free from any disease.
- Ruptures, blind or missing teats make ewes useless for breeding purpose. Ewes with hard meaty udders and abnormally large teats should be rejected.
- Old ewes with broken mouths are poor choice.
- The surest way of selecting animals for breeding purpose is by production test. Production test includes the type and finish at weaning time, prolificacy, weight of lamb at weaning time and weight and quality of fleece.

Selection of sheep for wool production

1. **Body Type and confirmation**: It should be as per the characteristics of breed chosen. In India, fine wool breeds are very few while most of the breeds are carpet and coarse carpet quality type.
2. **Quantity of wool:** It is determined by the density of fleece, staple length and completeness of wool covering. Density determines the closeness with which fibers are packed and is estimated by number of fibers per sq.cm. of skin surface. Density of wool is more also more the quantity of wool. The staple length influences both quantity as well as quality of fleece. The grading point of view staple length of 75 mm and above is considered of the superior quality.

3. **Quality of Wool:** It is determined by the fineness of its fibers, modulation percent staple length and soundness. The fineness is adjudged by measuring its diameter. According to the ISI standards of grading and classification of wool, the wool of 34.4 micron and below is considered as 'A' Grade, 34.4 to 37.0 is 'B' Grade, 37.1 to 40 micron is 'C'

grade and 40.1 and above 'D' grade. The diameter and modulation of fibre can be adjudged under lanometer. Fine wool have no modulation while carpet wool should have 10 to 20% modulation in fleece, the staple length of 3.5 cm and above can successfully be processed on the worsted system. While selecting and judging the sheep soundness referring to healthy and uniform wool growth on skin surface should be considered.

4. **Condition of wool:** It is determined by purity, presence of foreign matter, amount and distribution of yolk and colour of fleece.

Selection and judging of sheep for mutton:

Mutton type is characterized by a deep, wide, blocky body with symmetry, balance, breed character, thick fleshing, a strong constitution and quality.

While selecting a mutton quality sheep, one should actually look for good carcass characteristic, which are defined by the tenderness and juiciness of mutton. High proportion of lean to fat and also high proportion of meat to bone ratio etc.

Some of the general points to be considered are as under:

1 Breed Type:	Breed chosen should suit to mutton produced
2 Fleece and skin:	Pink skin is usually an acceptable type among most medium wool breeds.
3 Constitution:	Strong head with breed characters, strong back and loin. Four well placed legs.
4 Natural fleshing	A rump should have deep covering of Natural and finishing fleshing and fat which spread firmly and fully over shoulder, ribs, back loin, rump and legs.
5 Quality:	Clean cut well shaped head, bones of ample size and clean joint. Firm and evenly distributed flesh. Good light dense fleece symmetrically balanced body
6. Sex characteristics:	The rams with masculine characters should have strong bold head and neck, massive and powerful appearance bold carriage for begin a potent sire. The sheep should have feminine characters, fineness of features and maternal instinct.
7 Balance:	Blending together of all components of individual. It should be uniform in width, depth, fleshing, character and quality.
8. Type:	Erect and well set head and neck, alert action, Pleasing disposition.
9 Size:	It should be proper as per age, sex and breed

Selection of Goat

Selection is the choice of the individual to be used as parents. Individual selected must possess desirable characteristics. Goats are generally maintained for the production of milk and meat therefore the care should be taken to improve the flock through better breeding and selection.

Desirable characteristics in the buck:

1 He should be heaviest goat in the flock with a wide chest and well developed barrel, straight body, in excellent condition and strong legs are necessary.
2 There should be complete absence of physical defects that is twisted legs, overshot or undershot jaws.
5. He should be a twin.
6. He should be aggressive.
7. He should possess rugged mane on the neck and shoulders as this reflex breeding ability.
8. Good semen characteristics, especially absence of abnormal sperms.
9. Sexual Organs should be well developed.

Desirable characteristics in the doe.

Consider following points while selecting breeding female.

1. She should be large animal, excellent in confirmation with well developed body and should display the particular breed characteristics.
2. For meat goats, the rectangular confirmation of the blocky meat animal should be apparent. The dairy animal should display wedge shaped confirmation typical of good dairy animal. The legs should be long, udder should be well developed, non pendulous and without supper numeracy teats.
3. She should be a twin.
4. The temperament should be good particularly for the diary goats docility and good mothering ability are good features.
5. She should be good milker.

Questions:

1. Give the classification of sheep and goat according to utility.
2. Write down about the selection of Ram and Buck for breeding purpose.
3. Write the characteristics of does to be considered for selection.

EXERCISE NO. 5

1. **Title: Identification Marks of Sheep & Goat**
2. **Objective:** To keep the identity of individual animal
3. **Relevant information:** Identity of an animal has to be established soon after its birth. Many dairymen name their large animals. I.e. cows and Buffaloes. This can serve the purpose to some extent if the number of animals is less. But, a large farm it is always necessary to put some identification mark on the animal. In small animals like sheep and goat a number or a scar cut is essential. This will help in:
   1. Identifying the animal if lost or stolen.
   2. The details of animals in respect of breeding, feeding, management and treatment for records.
   3. Pedigree of the animal tracing back to its ancestors becomes easy and accurate.
   4. For insurance purpose.

4. **Precaution:** Check and ensure the number to be given to the animal before actual marking from breeding records. Use proper methods for putting the identification marks. Restrain the animal before putting the identification mark. Keep the record of numbers of identification in the livestock register to avoid confusion. The same number should not be repeated.
5. **Material required:** Tags & strings, Forceps, Ear punch, sharp scissors, Cotton, Spirit, Tincture iodine, paint.
6. **Methods of identification of sheep and goat.**

I) Ear Tagging: Metal tags with any combination of letters and numbers are used. Sometimes two tags, one in each ear, may be fixed. One tag carries the individual number and the other the flock number. This system provides not only owner identification but also identifies the lamb with its sire & dam.

Procedure:

1 Hold the lamb or kid properly.
2 Disinfect the self piercing tag with spirit or tincture iodine.
3 Clean the portion of the ear with spirit where tag is to be fitted.
4 Fix the self piercing tag directing with the help of forceps and locked keeping the number visible outside on upper edge of the ear.
5 Keep the tag neither tight nor loose on the ear.
6 Apply tincture iodine to the wound to prevent infection.

7 In case of non-piercing tag, make a hole on the upper edge of ear close to head, with ear notch or punch and disinfected with spirit.

8 Place the tag through the hole with numbered side on the back of ear and locked in position with pincers.

9 Take care that tag should not be tight or too loose but leaving enough space for growth of ear.

10 Apply tincture iodine on the wound to prevent infection.

II Ear Notching:

Notches cut in the ears make a rather easy method to identify animals. A notch represents a number depending on its location.

1. Sterilize the side ear punch and central ear punch or pair of sharp scissor or pincers.
2. Clean the ear with the help of cotton and spirit.
3. Side ear notches must be "V" shaped.
4. In case a hole is required, make use of sterilized central punch.

Care should be taken not to make notches too small to close up soon and not too large to deform the shape of ear.

III) Neck tags:

Some owners prefer metal or plastic tags large enough to be read from distance. These tags are fastened on neck chains. The disadvantage is that sometimes there is a chance that they may be lost.

IV) Tattooing:

Tattooing is done with an instrument tattoo punch, in which number or letters can be inserted. Each number is out lined with sharp needle projections. Tattooing can be done in the ear carefully. Print the cleaned area of ear with the number and rubbed tattoo ink into the holes with the fingers. The tattooing can also be done on the inside of the skin flap of tail of sheep and goat.

V) Paint Brands:

Paint brands are quickly applied and are quite reliable. However, they may wear off to the paint where they are difficult to see. Ordinary lead-base paints should not be used as they will not come out with normal wool-scouring and may lower the market value of the fleece. Commercial branding fluids that will remain on the sheep for a year and may be removed from the fleece in the regular scouring process are now available.

7) **Observations:** Observe and record the following: Legibility of mark after one week / one month/six months. Extent of healing of the wound after one week/one month/six months. Identify the marking after one week/one month/ six months.

Questions:

1 Name the different methods of putting identification marks on sheep and goat?

2 Why spirit is used for cleaning ears.

3 What precautions are necessary in tagging and notching?

EXERCISE NO. 6

1 Title : Feeding of Lambs and Kids

2 Objective: To know the feed requirement of Lambs and Kids for proper growth.

3 Relevant information:

The profit from sheep and goat depends largely on the knowledge and ability of the farmer to feed flock economically and yet derive maximum productivity. The leaves of common leguminous plants which are relished by sheep and goat are matki, mung, kulthi, udid, Lucerne, berseem, weeds, grasses, tree leaves & shrubs, roots and cereal leaves furnish a subsistence to these wonderful animal.

4. Material required:

Colostrum, milk, container, bucket, feeding bowl, milk, measure, heating device, clean water, concentrate mixture/ ingredients, green and dry fodder, mother i.e. ewe and doe, milk feeding bottle, nipple etc.

5. Procedure:

i) Feeding of Lambs:

There are different methods of feeding at different stages depending upon the age of animal. They are follows:

a) Feeding Suckling Lambs:

This is the early part of a lambs life in which it is dependent on its mother's milk to a considerable degree for its nutrition. Colostrums should be fed at the rate of 10 per cent of a body weight four times in a day for four days. Colostrum is the first milk drawn and fed to lamb within two hours after its birth. Milk should be fed to lambs at $1/10^{th}$ of body weight up to 2 months and $1/20^{th}$ up to weaning at 3 months of age. This period ends when the lambs are weaned.

It will be most economical to put the ewes and lambs on good pasture, Grazing on good pasture will sustain milk production of the ewes at a high level, Similarly the lambs also will nibble of succulent green forage. If the pasture is poor quality, the rations of these lambs may be supplemented with grains and oil cakes (starter feed) in addition to their mother's milk and pasture. Starter feed includes maize 42 parts, GNC 35 parts, when bran 10 parts, fish meal 10 parts, mineral mixture 2 parts and common salt 1 part.

b) Feeding Early – Weaned And Orphan Lambs:

Lambs are usually weaned at five months of age. But early weaning at eight to twelve weeks of age has been found to be advantageous and will intensify the whole operation. Similarly, some lambs may be orphaned due to the death of ewe or due to disowning by the mother, therefore young suckling lambs on creep feeding, early weaners and orphan lambs must be well fed.

c) Rations for creep feeders, early weaned & orphan lambs:

Up to six weeks of age, grain should be crushed before feeding to lambs. After this, grains can be fed as such except hard grains. The infant lambs should get good pasture or high quality legume hay preferably in the pellet form in addition to the grain. If only poor roughages are fed, their grains ration should be supplemented with a protein- cum – vitamin supplement with approximately 12 per cent digestible crude protein.

A few recommended rations for the creep feeders and weaners are as follows:

i) Maize 40%, Oat 30%, Barely 30% plus Lucerne hay fed ad libitum.

ii) Oats 20%, Maize 40%, Barely 20% and Groundnut cake 20% plus supplementation vitamin.

iii) Maize 25%, Oats 40%, wheat bran 20%, Groundnut cake 15% plus vitamin supplements.

The above feed should include 2% common salt and 2% mineral mixture

d) Feeding from weaning to market age:

The types of feeds used and the methods of feeding will vary with economic and climatic conditions and feed available. On an average lamb may be fed 225 to 450 g. of grains mixture depending on the grazing condition.

Concentrate mixture for lamb

During summer

Groundnut cake:	20 part } add 2 per cent common
Wheat Bran :	35 Part } salt & 2 per cent mineral
Crushed Gram	10 Part } mixture.
Oat / Barley	35 Part

During winter

Wheat bran	25 Part } add 2 per cent common
Oats/Barely/Jower	50 Part } salt and 2 per cent mineral
Groundnut cake	25 Part } mixture

II) Feeding Kids:

Kids should be allowed to suck their dams for the first 5 days to receive colostrums. After 5 days kids may be given whole milk at the rate of $1/10^{th}$ of their body weight for the first 30 days. It

is better to wean the kids and feed this amount of milk from the pail or feeding bottle in equal installment. The quantity of milk may be reduced to 1/20th during the third month. From the second week onwards a palatable and easily digestible mixture (starter ration) with 20-24% DCP and 70% TDN and good quality fodder may be offered to the kids. Milk feeding can be completely stopped at the end of third month.

Feeding schedule for kids of different ages

Ages Approx (Live wt. Kg.)	**Milk (ml)**	**Starter Ration (g)**	**Green Feeder**
Birth to 5 days- 1.2 to 2.0	Colostrum	------	-------
5-30 days 2.0 to 3.0	300 – 500	Small Qty	Small Qty
30-60 days 3.0 – 5-0	400-500	50 – 100	"
60 – 90 days 5.0 – 7.5	350 – 500	100 – 150	250
90 – 120 days 7.5-10.0	-------	200 – 250	250
5th & 6th month 10.0-15.0	-------	250 – 300	750

Source: Package of practices of livestock, 1985, Kerala Agriculture University, Mannuthy.

III) <u>Feeding Growers:</u>

Grower kids can be reared under intensive, semi intensive system of feeding Experimental evidence shows that under intensive system kids grow faster and attain more weight at slaughter. Under semi intensive system growth rate is intermediate.

Composition of kid rations. (Two types)

Ingredients	**Rations I Parts**	**Ration II Parts**
Ground cereals, oats, Barely, Maize or Wheat	50	40
Wheat bran/rice polish	25	15
Deoiled groundnut cake	12	12
Skimmed milk powder	10	---
Mineral mixture	2	1.5
Common slat	1	1.5
Horse gram	-	30

*Rovimix (25g/100g of the mixture)

e) Flushing:

About two weeks before rams are turn in with ewes, the good sheepman will put ewes on a grain ration or move them to fresh pasture areas where feed is abundant quantity. This process is known as flushing, flushing the ewes starts the heat periods earlier, which is an advantage when early lambs are desired. It also has effect on bringing all the ewes into heat at nearly the same time than other wise resulting in more uniform lamb crop. Flushing also increases the lambing rate and incidence of multiple births in the flock.

When ewes are gaining flesh their reproductive organs usually begins functioning normally. Twins under rugged range conditions are some times a disadvantage. Twins are smaller than a single lamb and ewe's milk is in scanty condition. However twins have an advantage when the flock is provided with extra fodder and grain.

Flushing rations:

Flushing rations for ewes may consist of;

A) a good mixed pasture of legumes and grasses.

B) A grass pasture plus 150 g of wheat bran per head per day.

C) Grass pasture plus 250 g. of grains and 450 g. of oil cakes.

D) Legume hay full fed plus 100 g. of wheat bran and 150 to 200 g. of grain.

E) Green fodder at the rate of 10 per cent of body wt. and 100 g of oil cakes per head per day.

6) Observations:

i) Note the body weight of the lambs and kids every week and month.

ii) Note the quantity of green fodder, dry fodder and concentrate fed to the lamb/kid every week.

4) **Questions:**

i) What are the different methods of feeding the lambs?

ii) Give ingredients suitable for lambs & kids ration?

iii) Suggest the satisfactory ration for lamb and kid?

iv) Why is it important to feed colostrums to the kids for the first five days?

v) What is flushing? Describe its importance in ewe's diet?

EXERCISE NO. 7

1) Title: Feeding practices for milking goats

2) Objective: To know the feeding practices followed for milking goats.

3) Relevant information:

The major part of expenditure in keeping a goat unit is on feed and fodder and is to the extent of 70 to 80% of the total expenditure. Therefore one should see that a protein rich quality feed is available to his livestock at moderate rate. Along with regular maintenance ration, additional feed is required for pregnant and lactating females. Proper and timely feeding of quality feed is the key for a successful goat keeping.

4) Material required:

Concentrate mixture, green fodder, dry fodder, feed ingredients.

5) Procedure:

A hot climatic country like India, green feed may be short during several months. The goats generally fed on tree leaves, and tender buds of mulberry, beans, ber, babul and tamarind. However, these leaves should be sparingly used for feeding dairy goats, as they do not provide sufficient nutrients. Balanced ration should be made by taking into consideration the nutritive value of available feed stuffs and at the same time utilize ingredients wherever possible from a cheaper source, usually milk type goat consume dry matter 5 to 7 per cent of its body weight, while meat goats have a DM intake of 3-4 per cent of their live weight.

Nutrient requirement are higher during lactation. The ration for lactating does should contain high quality roughages like Lucerne, berseem and other cereals grasses though which it will receive fresh nutrients i.e. minerals, vitamins and proteins. To supplement more nutrients particularly of energy, cereal grains at the rate of 350 g. for each liter of milk must be provided. The protein per cent may vary from 14 to 16 %. The feed may be fed in two lots. Add 1% trace mineralized salt and 1 % calcium phosphorus mineral mixture in concentrate mixture. Molasses may be used to increase palatability and reduce dustiness. Keep clean fresh water available at all times.

<u>The main components of the daily goat ration (feed)</u>

Roughages: This includes green and dry fodder, tree leaves, tender branches, dry and green fodder etc. come under this category. These contain more fibre and cellulose. Until the

rumen is 2/3 full, the activity of regurgitation does not start. Therefore, giving of roughages is a must. Goat also receives minerals and vitamins from the greens.

Concentrates (Premixed Goat Feed)

The feed is usually prepared from the cereals and pulses (grains) available in the particular tract. These grains are taken in proportion, ground and mixed together. These include maize, jowar, barley, oats, gram, tur, pea, wheat, rice bran and various oil cakes. A productive goat need concentrate mixture contain 14 to 16 % protein at a rate of 200 gm per day for maintenance and additional 300 to 500 gm per day as production allowance depending upon milk production.

Minerals, Vitamins and Antibiotics:

Readymade available mineral mixture is either added in the regular feed or else mineral brick is made available for licking in the goat pens. Vitamins like A, D supplement is given with feed. Keeping the feed free from bacterial fungus, antibiotics are added to the feed.

Formulation of concentrate mixtures with different DCP levels.

Ingredients	**Concentrated mixtures**			
Per cent DCP	14	17	20	24
Ground oat	20 parts	18 parts	------	-------
Ground barley	20 -"-	18 -"-	17.5 parts	7.5 parts
Ground Mustard cake	30 -"-	26 -"-	------	------
Ground Nut oil cake	---	12 -"-	32.5 -"-	42.5 -"-
Wheat Bran	30 -"-	26 -"-	17.5 -"-	7.5 -"-
Ground gram	---	-----	32.5"	42.5 -"-
Common salt	1.0 -"-	1.0 -"-	1.0 -"-	1.0 -"-
Mineral mixture	1.0 -"-	1.0 -"-	1.0 -"-	1.0 -"-

The quantity of feed given to the lactating does depends on the amount of milk produced. For tropical goats weighting 20-40 kg the above schedule may be followed or for every additional kg of milk produced, 400 g of concentrates or 1.0 kg good quality green fodder may be fed.

Nutrient requirement of milking goat:

Maintenance: A animal weighing 40 kg will require 40 g DCP, 500 g TDN 2.5 g calcium and 1.2 g phosphorous for maintenance.

Milk production: For each litre of milk produced, the dairy goat should be provided with 70 g DCP, 350 g TDN 3.0 g calcium and 2.1 g phosphorous.

6) Observations:

Note the green and dry fodder consumed by sheep/ goat per day.

Note the concentrates supplied to the sheep/goat per day.

Take the weights of animals every month.

Note the ingredients incorporated in the concentrate mixture.

7) Questions:

1. Prepare a concentrate mixture for milking doe using following ingredients.

i) Maize ii) Jower

iii) Wheat bran iv) Ground cake

v) Rice bran vi) common salt

vi) Mineral mixture

2. State the nutrient requirement of milking goat.
3. Write in brief about the main components of daily goat ration.

EXERCISE NO. 8

1) Title: Computation of ration for different classes of Poultry

2) Objective: To know the feeding practices followed for milking goats.

3) Relevant information:

The major part of expenditure in keeping poultry is on feeds and to the extent of 60 to 70 % of the total expenditure. Therefore one should see that a energy rich and protein rich quality feed is available to poultry increasing the rate. Along with regular maintenance ration, additional feed is required for growing fowls. Proper and timely feeding of quality feed is the key for successful poultry farming. Chicken feed shall be in the form of pellets, crumbs or mash. '1'he feed shall be free from rancidity, musty, odour, toxic ingredients, adulterants, moulds and insect infestation.

4) Material required:

Standard ration, different feed ingredients, grains, wastage cooked food and azolla .

Types of feeds:

Chicken feeds shall be of the following fifteen types:

Broiler Pre-starter Feed (BPS) — a ration to be fed to chicks, intended for meat production and to be used from I to 7 days.

Boiler starter Feed (BSF) — a ration to be fed to growing chickens, intended for meat production, from 8 to 2 I days.

Finisher Feed (BFF) — a ration to be fed to growing chickens, intended for meat production, from 22 days to finish.

Chick feed for layer (CFL) —- a ration to be fed to chicks intended for egg production from 0 to 8 weeks.

Grower feed Layer (GFL) — a ration to be fed to growing chickens, intended for egg production, from 9 to 20 weeks or until laying commences.

Layer feed for Phase I (LFP-1) — a ration to he fed to laying birds from 2 I weeks to 45 weeks.

Layer feed for Phase II (LFP-2) — a ration to be fed to laying birds from 46 weeks to 72 weeks. Phase II and I feed in layer cycle is necessary because there are changes in production, egg size, requirement of calcium, efficiency of digestion, age. etc.

Breeder Chick feed for broiler (BCFB)—- a ration to be fed to chicks, intended for broiler breeding, from 4 weeks.

Breeder Grower Feed for Broiler (BGFB) — a ration to be fed to chickens intended for broiler breeding, from 5 to 22 weeks.

Breeder Layer Feed for Broiler (BLFB) –- a ration to be fed to laying birds, intended for broiler breeding, from week 23 onwards.

Breeder Broiler Feed for Male (BBFM) — a ration to be fed to male birds intended for broiler breeding, from week 23 onwards.

Chick Feed for Layer Breeder (CFLB) --- a ration to be fed to chicks, intended for layer breeding, from 0 to 4 weeks.
Grower Feed for Layer Broiler (GFLB) — a ration to be fed to chickens, intended for layer breeding, from 5 to 22 weeks.
Breeder Layer Feed (BLF) — a ration to be fed to laying birds, intended for layer breeding from week 23 onwards.
Breeder Layer Feed for Male (BLFM) — a ration to be fed to male birds intended for layer breeding, from week 23 onwards.

Poultry feed formulated consisting following nutritional composition as prescribed in Bureau of Indian standard for poultry feeds.

Sr.No	Nutrients as per BIS Standard (%)	Type of Feed		
		Pre-starter poultry feed mash	**Starter poultry feed mash**	**Finisher poultry feed mash**
1	Crude protein	22.8 - 23	21.5 – 22.0	19.8 - 20
2	Ether extract	2.8 - 03	3.3 - 3.5	3.8 - 04
3	Crude fibre	05	05 - 06	05 - 06
4	Salt	0.5	0.5	0.5
5	Calcium	0.8 - 01	0.8 - 01	0.8 - 01
6	T-Phosphorus	0.7	0.7	0.7
7	Energy Kcal	2980 - 3000	3080 - 3100	3180 - 3200
8	Moisture	10.0 – 11.0	10.0 -11.0	10.0 -11.0

Nutritional requirement of layers and broilers

Characteristic	Broiler starter feed	Broiler finisher feed	Chick feed	Growing chicken feed	Laying chicken feed	Breeder layer feed
Moisture *(maximum %)*	11	11	11	11	11	11
Crude protein (N x 6.25) *(maximum %)*	23	20	20	16	18	18
Crude fibre *(max. %)*	6	6	7	8	8	8

Acid-insoluble ash *(maximum %)*	3.0	3.0	4.0	4.0	4.0	4.0
Salt (as NaCl) *(maximum %)*	0.6	0.6	0.6	0.6	0.6	0.6
Calcium (Ca) *(maximum %)*	1.2	1.2	1.0	1.0	3.0	3.0
Available phosphorus *(minimum %)*	0.5	0.5	0.5	0.5	0.5	0.5
Lysine *(maximum %)*	1.2	1.0	0.9	0.6	0.65	0.65
Methionine *(maximum %)*	0.50	0.35	0.3	0.25	0.30	0.30
Metabolizable energy *(minimum cal/kg)*	2 800	2 900	2 600	2 500	2 600	2 600
Manganese*(mg/kg)*	90	90	90	50	55	90
Iodine *(mg/kg)*	1	1	1	1	1	1
Iron *(mg/kg)*	120	120	120	90	75	90
Zinc *(mg/kg)*	60	60	60	50	75	100
Copper *(mg/kg)*	12	12	12	9	9	12
Vitamin A *(IU/kg)*	6 000	6 000	6 000	6 000	8 000	8 000
Vitamin D3*(IU/kg)*	600	600	600	600	1 200	1 200
Thiamine*(mg/kg)*	5	5	5	3	3	3
Riboflavin*(mg/kg)*	6	6	6	5	5	8
Pantothenic acid*(mg/kg)*	15	15	15	15	15	15
Nicotinic acid*(mg/kg)*	40	40	40	15	15	15
Biotin *(mg/kg)*	0.2	0.2	0.02	0.15	0.15	0.20
Vitamin B12*(mg/kg)*	0.015	0.015	0.015	0.01	0.010	0.01
Folic acid*(mg/kg)*	1.0	1.0	1.0	0.5	0.5	0.5
Choline *(mg/kg)*	1 400	1 000	1 300	900	800	800
Vitamin E*(mg/kg)*	15	15	15	10	10	15
Vitamin K*(mg/kg)*	1.0	1.0	1.0	1.0	1.0	1.0
Pyridoxine*(mg/kg)*	5	5	5	5	5	8
Linoleic acid*(g/100 g)*	1	1	1	1	1	1
Methionine + cystine *(g/100 g)*	0.9	0.7	0.6	0.5	0.55	0.55
Source: **BIS. Poultry feeds - specifications, fourth revision.**						

Feed Formulation

Feed formulation is the process of quantifying the amounts of feed ingredients that need to be combined to form a single uniform mixture (diet) for poultry that supplies all of their nutrient

requirements. Since feed accounts for 65-75% of total live production costs for most types of poultry throughout the world, a simple mistake in diet formulation can be extremely expensive for a poultry producer.

Feed formulation requires thorough understanding of the:

(a) Nutrient requirements of the class of poultry (e.g., egg layers, meat chickens or breeders);
(b) Feed ingredients in terms of nutrient composition and constraints in terms of nutrition and processing, and
(c) Cost and availability of the ingredients.

Most large-scale poultry farmers have their own nutritionists and feed mills, whereas small operations usually depend on consultant nutritionists and commercial feed mills for their feeds. It is therefore essential that formulations are accurate because once feeds are formulated and manufactured, it is often too late to remedy any mistakes or inaccuracies without incurring significant expenses.

Feed formulation is both a science and an art, requiring knowledge of feed and poultry, and some patience and innovation. Typical formulations indicate the amounts of each ingredient that should be included in the diet, and then provide the concentration of nutrients (composition) in the diet. The nutrient composition of the diet will indicate the adequacy of the diet for the particular class of poultry for which it is prepared. It is common to show the energy value in metabolisable energy (kcal or MJ ME/kg feed) and protein content of the diet but comprehensive information on concentrations of mineral elements and digestible amino acids are also provided.

Formulation of 50 kg bag (broiler feed)

Broilers have different feed requirements in terms of energy, proteins, and minerals during different stages of their growth. Therefore, it is important that farmers adapt feed rations to these requirements for maximum production. Young broilers have a high protein requirement for the development of muscles, feathers, etc. As the broilers grow, their energy requirements for the deposit of fat increase and their protein requirements decrease. They require high protein content in their starter rations than in the grower and finisher rations. Broilers should have a feed that has between 22 – 24 per cent digestible crude proteins, DCP.

The following guidelines can help the farmer to make the right feed at each stage of growth:

- 7.2 kg of whole maize
- 11.9 kg of maize germ
- 9.5 kg of wheat pollard
- 7.2 kg wheat bran
- 4.3 kg of cotton seed cake
- 3.4 kg of sunflower cake
- 2.1 kg of fishmeal
- 1.4 kg of lime
- 2.5 kg of soya meal
- 45g of bone meal
- 10g of grower PMX
- 5g of salt
- 5g of coccidiostat
- 5g of Zincbacitrach

Broiler starter feed (1-4 weeks)

- 28.6 kg of whole maize
- 8.6 kg of fishmeal
- 10 kg of soya bean meal
- 2.9 kg of lime
- 70g of premix

Amino acids to add

- 35g of lysine
- 35g of threonine

Preparing of layers chick mash (1-4 weeks)

Chicks require feed with Digestible Crude Protein (DCP) of between 18 to 20 per cent. Amino acids are important nutrients in all feeds in order to make a complete feed for all animals. For hybrid chickens, the addition of amino acids is very important to maintain a balanced diet for fast growth

(50 kg bag of chick mash)

- 22.5kg of whole maize
- 6.5 kg of wheat bran,
- 5.0 kg of wheat pollard,
- 12 kg of sunflower (or 12 kg of linseed),
- 1.1 kg of fishmeal
- 1.25 kg of lime
- 30g of salt
- 20g of premix

Amino acids to be added

- 70g of tryptophan
- 3.0g of lysine
- 10g of methionine
- 70 g of threonine
- 50g of enzymes
- 60g of coccidiostat
- 50g of toxin binder

Growers feed

To make a 50 kg bag growers feed (1 to 8 weeks), it is very necessary that pullets or young layers should be provided with a feed having a protein content of between 16 and 18 per cent. Such feed makes the pullet to grow fast and prepare for egg laying.

Layer Mash:

70 kg bag layer mash (18 weeks and above)

- 24.3kg of whole maize
- 8.6kg of Soya
- 5.7kg of fishmeal
- 7.1kg of maize bran, rice germ or wheat bran
- 4.3 kg of lime
- 180g premix

Amino acids to be added

- 70g lysine
- 35g methionine
- 70kg threonine
- 35g tryptophan
- 50g toxin binder

EXERCISE NO. 9

1) Title: Shearing and grading of wool

2) Objective: To know the methods of shearing and grading of wool and mohair

3) Relevant information: Shearing is nothing but clipping of wool and mohair from sheep and goat quickly, completely, easily and with minimum discomfort to the animal and operator. Sheep in India are generally shorn immediately after the end of winter season when warm weather commences and when sufficient grazing is available fields. In places where two shearing are obtained, the second one is carried out at the end of rainy season. The sharing should not be done until there have been enough warm days to bring out the grease in the fleece. Shearing should not be carried out at a time when the climate is very hot or very cold. So shearing is done during March and April.

Shearing is now done mostly with shearing machine. In India the traditional sheep farmers still use hand shears. With the machine, the sharer does a neat job, gets more wool and is not so likely to cut the sheep as with a hand shears. Hand shearing is recommended for flocks of 20 or less, hand machine (clippers) for flock of less than 150 and power machines for flock above 150

5) Materials:

1) Shearing scissors.
2) Hand clipper
3) Power machine

6) Procedure:

I) Shearing with scissors or hand clipper.

Shearing commences early in the morning before flocks have access to feed and water. A clean dry place is selected as a shearing yard, so that wool is not contaminated with dust. Each sheep is taken out from the night pen. The shearer squats on the ground and holds the sheep between his legs. Wool is clipped with the shears held in the right hand and the left hand is placed on the body area to be shorn and it therefore direct the clipper.

Shears with well-sharpened blades are essential to obtain uniform cuts and to effect quick shearing. Good skill in handling of sheep and shearing along with the necessary stamina is essential in a successful shearing operation. It is desirable to clip the wool in legs, belly and head first and keep these separate from the body wool. The aim should be cut the fleece in one piece. The fleece should be rolled up with the skin side out.

There are a number of disadvantages in hand shearing. It is time consuming and the fleece cannot be evenly cut, it becomes tedious. One important advantage that hand shearing has over machine shearing is that the fleece can be graded on the basis of individual cuts.

II) Machine Shearing:

Recently machine shearing has been introduced in India. The incentive being given to machine shearing is considerable as in addition to the low cost of shearing by machine, grazer is also able to sell the wool on the spot.

The shearing machine is a metal comb over which a cutter is driven, the whole being held in a hand piece. A system of flexible cut, encased and broken by various joints makes it possible to reach the various parts of the sheep. The power is usually supplied by oil or electricity.

Grading of wool and mohair: An expert grader examines the scored wool for length, diameter, fineness, crimp, pliability, color, luster and other qualities before giving each bundle a grade. In India, the grading or standardizing of wool has not been undertaken on any appreciable scale. Wool is obtained from such a large number of breeds of sheep & the varieties are so many that the grade finds it difficult to define its quality. However, the factors that are taken into account for judging the quality of wool are as under.

i) Fineness of fibre: The thinner and fine fibre, more valuable in wool. The unit for measurement of thickness is a micron or 1/10, 00 of a centimeter. The wool fibre has a diameter varying from 12 to 80 microns. Fine wool rages from 15 to 25 microns in diameter. The fleece obtained from Merino sheep breed and mohair from Angora breed of goat are of this quality.

ii) Length of Fibre: The staple length of the fibre is important in determining the use that may be made of it in manufacture. Within limits of length classifications, long wool is more valuable than short wool.

iii) Shrinkage: Wool contains grease, dirt various kinds of vegetable matter and other materials. The difference in the amount of clean wool & the grease fleece weight is called shrinkage.

iv) Curliness of fibre: wool as it grows on sheep & goat develops a wavy structure which is called the curliness. In the fine wool these curls are larger in number and more regular in unit length of fibre than in coarse fleece.

v) Strength of fibre: The stronger fibre and less the break. The higher is the quality of the wool.

vi) Luster, colour and Elasticity: The more lustrous and shining to the wool, whiter colour and more elastic wool, more is the price because it produces smooth and shining yarn and cloth and can be dyed better.

vii) Modulation: A true wool fibre has no spelling central core in it. As a rule, the finer the wool and more elastic and uniform the fibre are the better it is considered for spinning purpose.

Classification of Indian wool for export:

The system of classification of Indian wool for export trade is more or less based on the territorial menclature instead of by breed and type of sheep. The following are the main recognized qualities used in the export trade.

JORIA : Superior, white: first white: first yellow: light grey.

HARNAI White: Grey.

BIKANERI: Super White: Superior pale yellow: first yellow, Average white, grey, black Ginned.

RAJPOOTANA: White: Yellow: Grey.

BIBRIK: White: Grey.

BEAWAR: White: Yellow: fawn & Grey.

MARWAR: White Yellow: Grey.

COMMON BLACK AND GREY: Black & Grey.

Observations: Take the weight of wool of each sheep/ goat. Grade the wool considering length, shrinkage, curliness, strength, colour elasticity and modulation. Note the time required for shearing sheep/ goat by hand clipper and machine shearing.

Questions:

1) Give the detail procedure of shearing wool/ mohair.
2) Why the grading of wool necessary?
3) Give various factors affecting grading of wool?
4) Give main classification of wool for export.

EXERCISE NO. 10

1 Title: Important management practices

2 Objective:

i To get the farm operations completed in time and properly.

ii To provide better and regular care to animals.

iii To get higher returns through efficient management practices.

3 Relevant information:

The livestock farm is full of life and activity with a multitude of operations being carried out from time to time. The farm manager organizes the various activities on the farm as a routine. On the livestock farm it is customary to draw up a schedule for daily farm operations so that personnel working on farm can carry out operation smoothly (routinely)

4) Material required:

Broom, brush, water , bleaching powder, phenol, washing soda, malathion, cryosol, copper sulphate, nicotine sulphate, lindane, pyrethrin, arsenic sulphate, coal - tar, creosate, tobacco, knife, hot iron, rubber band, clipper, resole etc.

5) Procedure:

1. Cleaning: Sanitation and cleanliness are key to good health. Unsanitary condition provides scope for development of pathogenic microorganisms which cause diseases. Regular cleaning and disinfection of animals and sheds prevent infection.

Empty the water troughs and scrape sides and bottom with a brush. Wash it with clean tap water and apply white wash. Clean the floor, gutter, and manger by removing dung, urine and feed left over carefully. Scrape the floor with the brush and broom and wash it with clean water.

Remove the cobwebs with the help of long broom.

Prepare the spraying solution of the desirable concentration of appropriate chemical and spray it.

1 Bleaching powder 30%

2 Phenol 1 to 2%

3 Washing soda 4%

4 Malathion (10ec)2 to 2.5%

5 Malathion (40ec) 0.5%

6 Cryasol 2 to 3% in hot water.

Repeat the spraying at frequent intervals.

After spraying is over leave the shed for few hours, so that it gets fresh air.

Take the animals in the shed when it is dry.

2. Deworming:

Internal parasites are more numerous and heavy infestation is more likely to occur when sheep and goat are confined to the same area year after year. Low, wet land and humid conditions are favourable to the development of internal parasites.

Common stomach worms, [round worms or tape worms] twisted stomach worms are more common

Symptoms:

Infested animal; becomes listless, thin, weak and unthrifty. When infestation is heavy, a swelling known as bottle jaw may develop under the jaw. Some animal will be die due to heavy worm infestation.

Prevention:

Since the tiny worms that appear on the blades of grass are dependent upon a host for survival, the rotation of pasture every two weeks will help to control the common stomach worms.

Treatment: drenches may be given with the help of bottle.

Care should be taken that the mixture should not get into the lungs. Prepare 1% of the solution of copper sulphate with water. When large flock is to be dosed 450 g. of copper sulphate should be dissolved with 45 liters of water.

Take part of the water and heat it properly and add copper sulphate to dissolve.

The animals should be kept away from food for 12 to 14 hrs.

When round worms and tape worms are present in intestine, add 28 gms of nicotine sulphate to each 4.5% and one percent copper sulphate solution.

3) Dipping: Sheep and goat are to be dipped at least once in year to eradicate ectoparasites (ticks, mites, and lice etc) In India, sheep can dipped immediately before post winter shearing and post autumn shearing.

Precaution: Ewes and does in advanced stage of pregnancy should not be dipped.

Avoid dipping in rainy days as the dip may be washed off the fleece.

Allow water and rest to sheep/ goat before dipping so that sheep / goat will not drink dip solution.

Do not dip sick animals, sheep / goat with open wounds, every young lambs / kids and stock being sent for slaughter. Dip on day which is neither too hot not too cold.

Allow sheep / goat fifteen minutes in draining pen after dipping.

The ram / buck should not be dipped during breeding season for fear of injuries to penis.

Procedure: Follow the manufacture's instruction thoroughly for preparation of solution. The soiled and dung stained wool on the crutch of sheep / goat should be removed.

Common chemicals used for dipping livestock

Chemical	Concentration in DIP	Remark
Lindane Dip	o.31% gamma isomer concentration	For young stock
Pyrethrin arsenic sulphide powder dip	0.2% total arsenic	Including 0.13 % soluble arsenic
Coal-tar cresole or phenol dip	0.76 % total bar oil	Including 0.36% tar acids.
Nicotine or tobacco dips	0.1% nicotine	Soak 15 kg. Tobacco in 500 lit of water

Animal can be dipped by hand bath method or by a swim bath method.

Hand bath is used for small flocks. A tank of galvanized iron about 1.2 x 1.0 x 0.5 m is used.

Each sheep / goat is held above knee and then lifted into the bath and then turned over on its back.

It should be kept in dip for two minutes, its head should be immersed at least once.

It is then lifted on to a draining board where the surplus dip is squeezed from its fleece to go back in to the bath.

Swim bath is used for large flock of sheep / goat.

In general measurements of tank are 1.5 x 2.5 x 2.0 m.

The sheep / goat, lowered into the deep end of the dip.

Swim through and walk up to the drying pen.

Following is the list of chemicals to be used according to ecto-parasites.

Maggots - Any sulphur containing dip.

Lice - fennorvate powder, Butox, Malathion.

Thicks - Fennorvate powder, Butox, Endosuophon.

Flies – Butox and malathion dip, Nuvon.

Scab – Any time sulphur solution.

Spraying:

This comprises spraying a weak fly repelling dip solution over backs and sides of animals packed. Fairly, tightly together in a pen. Spraying sheep and goat at a regular intervals is very effective in controlling ticks especially in tropical countries.

Prepare same solution as that of dip solution. Fill up the solution in a hand sprayer or power sprayer. The use of sprayer is depending on the size of the flock and equipment available.

Spray the solution over backs and sides of sheep / goats. About eight to ten liters of solution are required for spraying each animal effectively.

Docking: Removal of tail from the body in sheep / goat is called docking. Lambs not docked accumulated a great deal of filth around the tail, which often result in fly strike and maggot infestation.

Method of docking:

1 Docking with knife.
2 Docking with hot iron.
3 Rubber band method of docking
4 Docking with emasculator.

Holding the lamb for docking:

The lamb should rest on a block of wood or on bench of convenient height for the operator. The lamb should be held in much the same position as for castration with tail resting topside of board.

For docking with knife the lamb is held in the same way for castration. The tail is served about 2.5 cm from the body as measured on the under side of the tail. Press the skin towards the body before cutting, leaving loose skin above the cut (this closes over the wound). Serve the tail at desirable level. A band may be tied at the base of the tail before cutting to prevent bleeding, which should be removed three to four hrs after cutting. Apply some antiseptics to the wound.

Use of hot instruments – pincers or chisels – results in less loss of the blood and less danger of infection than knife, but wound heal more slowly.

Heat the instrument to a dull red colour protects the buttocks of the lamb by placing tail in a slot in the end of the board or by putting it through a whole in the board. Serve the tail rather quickly avoiding excessive burning.

5) Ringing:

If the ram is not completely shorn, then he should be clipped. For clipping hold the ram on his hind legs and clipped from the neck and from the belly in the region of the penis (ringing). This will make it easier for the ram to make proper contact with ewes during act of mating.

6) Tagging:

Shearing the locks of wool and dirt from the dock. Tagging the ewes make service by the ram more certain. The ram is also trimmed around the sheath.

7) Painting of rams:

To obtain a visual picture of the progress of mating, the rams may be marked by painting their breast with a thick paste made for this particular purpose.

a) Ewe that accepts the ram is therefore marked by a smear on the rump.

8) observation:

1 Observe and record the appearance and weight of animal before and after deworming.

2 Observe and note the external parasites on the body of animal before dipping / spraying.

3 Note the time required for healing the wound of docking.

9) Questions:

1 Write the importance of regular cleaning?

2 What chemicals are used for dipping / spraying?

3 What is meant by deworming? Write in detail about deworming?

4 Why docking is done? Explain the methods used for of sheep?

Exercise NO. 11

1. Title : Study of Systems of Rearing in Sheep and Goat.

2. Objectives : 1) To study the different systems of sheep and goat rearing.
2) To study the economy of different rearing systems.

4. Material required:

Pegs, rope feeding boxes, grazing land, harvested waste fields, shrub, bushes, trees leaves and live sheep and goat.

3. Relevant information:

In traditional management practices, sheep and goat are left for grazing because natural feeding behavior of these species fulfills their nutrient requirements. Although both of these species are fed on grazing still there is a difference in their behavior of feeding. Apart from this, there are different conditional methods of rearing these species depending upon the availability of the natural feed resource and no. of the animals, following four systems of rearing are these.

Methods :

i) Tethering, ii) Extensive or open range, iii) Semi intensive, iv) Intensive

i) Tethering:

In this system, goat (one / two) are tied at one place with a rope of 3-5 m length with a support to a peg of 35-50 cm. height. The peg is kept in grazing area and goat is able to feed / browse over limited area depending upon the length of rope. The location of grazing can be changed, if necessary.

ii) Extensive:

In this system, the goats are left for grazing up to 8-9 hours/day. This system of feeding is very common. The goats are let loose in flocks and sometimes both sheep's and goat are left commonly. This is very easy & convenient method, it requires very less resources and less expensive the system is helpful to add the fertility of the soil and control the weeds. But the animals are fed on residues of natural herbages, tree leaves, hence poor availability of nutrient and low productivity.

One of the advantage of this system is that continues presence of rams / bucks / in female flocks. The number of ewes/does to be in estrous will be more. The only drawback of this system is that when the rams/ bucks are allowed to run with the ewe/doe flock. The ewe/does are too much disturbed by the rams/ bucks to pushing and fighting among themselves. Another limitation of this method is that as the mating is purely random, no accurate breeding records for either males or female can be maintained.

iii) Semi Extensive:

This is the combination of both extensive and intensive methods. In this system Goat are let loose for 4-5 hours and then they are brought back under stall and fed with tree leaves or dry fodder. This system spares better nutrients availability than extensive system.

iv) Intensive:

This system includes feeding of goats under the stalls for complete day. They are fed with cultivated fodder tree leaves/ grasses and concentrates to meet the requirement. The advantage of this system is that the quality feed can be given which may increase the productivity. Secondly, the flock can be protected from the contaminated water and pasture, Also the controlled breeding can be adapted and breeding records can be maintained. Limitation of this system is that the limited varieties of feeds / fodder the goat may develop some mineral deficiency.

The precaution under this system should be taken that, the animals should be let loose at least two time a day for sufficient exercise, the limitation of this method is that as the male are away from the females flock the numbers of does / ewes to be in heat may be comparatively less.

Observations:

Feed intake weekly body weight, under different rearing systems.

Questions:

i) Merits and demerits of different rearing systems.

ii) Compare and differentiate between different rearing systems.

iii) Write in brief about rearing systems in sheep and goat.

iv) What are the different methods / rearing in sheep and goat system?

EXERCISE NO. 12

Title: Preparation of animal for show

Objective: To offer an opportunity to observe and advertise the flocks and to make profitable sale.

Relevant information:

Sheep shows offer an opportunity for the producer to show the public fruits of their efforts. Sheep show is the better place for a prospective breeder to learn most desirable in type of sheep. Many farmers attend shows for the purpose of buying animals with which they improve their flocks. Thus, show help us to make profitable sale.

Show classification:

Shows of sheep are classified according to the age and sex. The classes may vary some what from show to show. In general, sheep show consist of individual classes for breeding males and females of different ages and group classes consisting of either females and males or mixed sex groups. In addition to the breeding classes, many shows have market classes for sheep. Market classes judged largely upon their market qualities.

Following are the examples of show classes that are common at many shows.

Individual classes for breeding animals

1) Two year old or over:

This class is usually provided for both ewes and rams. To quality the animal must be two year older by a certain time. Usually the base date is either September or January for determine the age. Some shows base the age entirely upon the teeth.

2) One year, under two:

In this class the animals to be shown must be one year old but less than two years.

3) Lamb class:

Lamb class for both ram & ewe, lambs require that the animals must be less than one year old to be eligible.

4) Group classes:

They are for showing a group of animals by the various exhibitors rather than singles. Group usually consists of from 3 to 5 animals. They may be of mixed sex and age, same sex but different ages, mixed age but same sex, or the same sex and the same age.

5) Market classes:

Market classes vary considerably with different shows. Some prefer to classify according to age, while other classify according to weight. Groups may range in number from three to a truckload.

Breeding animals for show:

Breeding animals are generally put into a high degree of flesh before showing. While the excessive finish is undesirable for the best reproductive performance. The show flock should be selected early. It takes time to put on to finish required.

Feeding animal to show:

Proper feeding of animals for show depends upon the class and the age of sheep. I.e. medium wool sheep, fine wool sheep & long wool sheep. The length of the time required to put show sheep into proper finish depends upon their condition at the beginning of the feeding period and to the class of the sheep.

A) Feeding medium wool sheep:

Medium wool sheep often refer to as the mutton breeds should be fed so that their mutton qualities will show to best advantage. Usually a grain ration is required to finish sheep for shows. High protein particularly linseed meal gives the more bloom which materially adds to their appearance.

b) Feeding fine wool sheep:

Legume hay of high quality should be fed free of choice when pastures are not available cabbage, carrots, turnips are excellent feeds. For conditioning sheep for shows these feeds keep the digestive system in good condition and may be fed while on the show circuit.

c) Feeding long wool sheep:

Long wool breeds tend to develop unevenness and patchiness in their fleshing when over finished. To minimize this tendency, more oats and bran should be included in their ration.

D) Feeding breeding lamb:

Ewes need excellent pasture to produce a heavy milk flow which is so important in rapid growth and finishing of the lamb. Creep feeding of shows lamb is usually necessary to develop the lambs for success in the show ring. Breeding lambs should not be fed a concentrate ration too high in the high energy grains.

E) Feeding market lambs:

Market lambs are fed same as breeding lambs, except that more of high energy grain such as corn, sorghum grain, and barley are fed.

Management of show sheep:

1) Keeping the animal cool:

During warm weather show animal should be kept in open, well ventilated barn, shade or under shade. The bed ground is kept clean and dry to prevent wool staining.

2) Pest control:

The flocked should be dipped or sprayed for external parasites control not later than six weeks before show time.

3) Trimming the feet:

The feet of the show animals should be inspected every six weeks and necessary trimming be done.

Training the sheep to show:

The sheep should be taught to stand properly upon all four leg and not to move the hind feet when the showman shows the sheep. In teaching the animals to stand properly and in showing, the showman should take a position to the left side of the animal; he should grasp the wool lightly under the chin with his left hand and with his right hand to keep the sheep in proper position.

Point to be considered while showing the sheep:

1 The animals must be in the best possible condition.
2 The sheep should be placed in the line and the showman should take the position to the left.
3 The animal's merit should not be pointed out to judge.
4 If required at time of the show, the animal should be moved to new position from behind and never from the front.
5 The animal should be kept standing properly on its feet.

EXERCISE NO. 13

Title: Culling of sheep and goat

Objective: To bring about genetic improvement of the flock.

Relevant information:

In order to bring out genetic improvement in the flock the farmer must cull undesirable sheep and goat every year. It is better to feed fewer good yielders than to feed many poor producers. The proper culling depends largely on ability to classify sheep and goat correctly. Culling is the continuous process in sheep and goat farming.

Proper time for culling:

It is better to cull a sheep during September – October shearing so that the culled stock are not required to be maintained during the lean period that follows.

1) Lambs / kids:

Lambs / kids may be culled at weaning stage on the basis of following consideration:

1 Not confirming the type.
2 Coloured or spotted if the objective is to maintain the white fleeced flock.
3 Malformed
4 Suffering from incurable disease.
5 Not attaining proper weight/ show growth.

2) Ewes / does:

2 to 3 weeks before mating, cull ewes or does.

1 Which did not lamb/ kid successively in 2 years
2 Which did not nurse their lambs / kid.
3 Which are more than 7 years.
4 If there are still ewes more than required number, cull according to fleece weight or wool quality.

3) Rams / bucks:

1 Which are not fit for breeding purpose.
2 Which are continuously used for more than 2 years in a flock.
3 Which are five years old or more.
4 Whose fleece weight is below the average for that particular crop of rams in that season.
5 Whose merits in an other required characteristics are below the standard setup for the flock

Other important defects for which sheep or goat should be culled are:

1 Aged sheep/ goat especially if the incisor teeth are faulty.

2 Long or short jaws.

3 Undesired sheep or goat

4 All deformed sheep or goat with crooked legs or feet with hocks approaching with each other.

5 Leggy sheep having a carcass not in proportion to legs.

6 Sheep with narrow shoulders.

7 Patchy wool sheep.

8 Sheep growing very light and mushy wool and not characteristics of the breed or suited the type of country.

9 Ewes / Does with defective udders.

Questions:

1 List out important defects for which sheep or goat should be culled.

2 Why the culling is necessary on sheep / goat farm.

3. What is culling?

EXERCISE NO. 14

Title: Judging of the Sheep and Goat

Objective: To judge the best animal for milk purpose.

Relevant information:

There is close relationship between the production and type of dairy goats. Therefore the breeder should also consider the type of dairy goats. The standard of the breed is largely shaped in exhibitions and shows by judging the goats. Hence the judging of the goats provides chance for buying or selling superior breeding goats.

Precaution:

1. The judge must be trained and experienced in observing weak and strong points in goat.
2 The goat should be observed carefully for giving correct score.

Methods:

A By considering milk production records.

B By following pedigree sheet.

C By using score card.

Procedure:

A) By considering milk production records:

For judging the goats it is necessary to considered the milk production records. In this method the milk is weighed (morning and evening) and composite sample of the milk is taken to determine the butterfat content. This test is important to getting value of goat breeder in selecting breeding animals.

B) By following pedigree sheet:

It is possible to judge the goats by checking owner's pedigree records and the records of the ancestor for two or more generation's back.

C) By using score card:

(Ideal type and breed characteristics must be considered in using score card) Ask the attendant to the animals one behind the other for a short walk of five minutes. Watch the animals from 1.5 – 2 meter distances to find out defect while walking. Bring the animal again and arrange in the ring for making close inspection for age by dentition quality of skin and udder. Make the total of the marks given and place the animals according to the order of merit based on total marks obtained by the animal, i.e. 1,2, 3 and support and placing with brief but sound reason.

The animals are classified on the basis dairy type as follows;

Grade	**score point**
Excellent	90 and above
Very good	85 – 90
Good	80 - 75
Acceptable	70 – 80
Fair	60 – 70
Poor	below 60

Score card for judging dairy goat

Physical parameters	**Perfect score**	**Student score**	**Teachers score**
		A B C D	A B C D
General appearance (30 points)			
1 **Head :** Medium in length clean cut , brad in muzzlo strong jaws, bright eyes broad fore head.	5		
2 **Shoulder blade:** Set smoothly, forming junction with the body.	2		
3 **Back:** Strong, straight	2		
4 **Lion** Broad, strong and nearly level	2		
5 **Rump:** Long, wide & nearly level	2		
6 **Hips:** Wide ,level,with back	3		
7 **Trunk** : Wide apart	2		
8 **Pin bones:** Wide apart loer than hips	2		
9 **Tail head:** Slightly above & neatly set	3		
10 **Tail:** symmetrical with body	2		
11 **Legs:** Wide apart, squarely set, strong with fore legs straight	2		
12 **Hind legs:** Wide apart bone flat & flinty, tendons well defined pasterns strong, hocks cleanly moulded.	3		

B) Dairy characters (20 points)			
1 Neck: Long & lean clean cut throat	3		
2 **Withers:** Well defined & wedge shaped	3		
3 **Ribs :** Wide apart, rib bone wide, flat & long.	4		
4 **Flank:** Deep & arched	3		
5 **Thighs** : In curving to flat from side, apart when viewed from rear	4		
6 **Skin:** Fine texture loose, hair, fine	3		
C) Body capacity (20 points)			
1) **Barrel**: deep, strongly supported, ribs wide apart & well sprung, depth & wide tending to increase towards rear	10		
2 **Heart girth:** Large, resulting from lung, well sprung four ribs, wide chest floor	10		
D) Mammary system (30 points)			
1 **Udder:** capacity & shape, long wide & capacious, extended.	6		
2 **Rear attachment of udder:** High & wide halves evenly balanced & symmetrical	6		
3 **Fore attachment of udder:** Carried well forward, tightly attached, without packet, blending smoothly in to body.	6		
4 **Texture:** soft, pliable, & elastic, free of scar tissue, well collapsed after milking	5		
5 **Teats:** Uniform, of convenient length & size cylindrical in shape, well apart, squarely placed & easy to milk	7		
Total	**100**		

EXERCISE NO. 15

Title : Preparation of animal for slaughter and different methods of slaughter

Objectives :
i) Precaution to be taken for preparation of animal for slaughter.
ii) To know the different methods of slaughtering.

Material Required:

1) Knife
2) Carbon-di-oxide gas.
3) Electric stunner.
4) Pan for collection of blood.
5) Weighting balance.
6) Captive boll pistol.

Procedure:

Slaughtering means putting the food animals to desk and therefore prepare the carcass for human consumption.

Before slaughter the animals following points are to consider so as keeping the animal ready for the process.

1. Allow the animals at least 24 hrs before slaughter.
2. Keep the animals off-fed during resting period.
3. Provide clean water adlib.
4. Do not give solid or any such food.

B) Method of slaughtering:

Methods of slaughtering should be aimed at complete heeling as for as possible and least unnecessary suffering or pain and minimum struggling to the animals. For good bleeding more than half of the blood must drain out at the time of slaughter which determines keeping quality of meal.

There are two main types of slaughter method.

1. Scientific or Human slaughter.
2. Ritual slaughter.

1) Scientific or Human slaughter:

This method avoids unnecessary pain and cruelty to the food animal and ensures as complete bleeding as possible. It also ensures speed of operation and safety of the personnel. In this method the animal is stunned before slaughter and which bleeds more perfectly.

Stunning can be done by mechanical (captive boll-pistol) electrical or chemical method. Then bleeding of animal is done.

Their yield of blood is as follows.

1. Buffalo & Cattle - 10-12 kg in 5 minutes
2. Sheep & Goat - 1-15 in 5 minutes
3. Pig - 2-3 kg in 5-6 minutes.

2) Ritual Slaughter :

Slaughter without prior stunning slaughter of food animal as per the religious rights are referred as 'Ritual Slaughter'. These are widely practiced in many counties. In India and for –East practically all the meat animals are slaughtered in conscious state.

This method includes following types.

1) Ritual or Sikh method :

In this method the head of the animal is chopped off with one big stroke of a swore. This method is inferior as far as the efficiency of bleeding. Here, since the medulla oblongata is damaged, bleeding remains incomplete.

2) Halal Method:

This is the method followed in Muslim countries. In this method neck of the animal is served by cutting the four major blood vessels-carotid arteries and jugular veins with a sharp knife Spinal cord is left intact. So the nerve centres controlling the heart and lungs remain functional and an efficient bleeding is ensured. It also enhances the keeping quality of meat.

3) Jewith Method:

Here the animals to be slaughtered should be active. In this method the incision across the neck is made by single rapid thrust of sharp knife which sever skin, mussels, esophagus, trochea, carried arteries and jugular vein. The blood vessels must be removed before retail sale of meat. It is for this reason that only fore quarter are normally eaten. Jewith slaughter is under taken by a cuter. Carcass fit for Jewith consumption is stamped with cutter seal on the brisket.

Under these the animals are to be fully conscious, killed and bleed thoroughly by one clean stroke of the knife. Animals are however hoisted and shackled first. A 16-inch (40.6 cm) razor-sharp steel knife called the chalaf is stuck into the throat, the shohet, in an operation in which the animal is killed and bleed at the same time. Skinning is made from the chest down to the level of the belly, and the chest is cut open first for inspection and later evisceration.

4) Neck stab (Evernazive) method:

It is followed in Spain, some parts of Italy, Mexico and some South American countries. In this method cattle are plunging a short-double edged knife at grope of neck severing the medulla oblongata.

Observations:

Slaughter the animal with different methods and compare.

Questions : 1. How the resting of goat before slaughter is essential.

2. Why the drinking water is given before slaughter.
3. Why stunning is not followed in ritual methods of slaughter.

EXERCISE NO. 16

1. Title : Dressing percentage of meat, Bone ratio, Different meat cuts.

2. Object : 1) To know the dressing percentage of sheep, Goat at different cuts.
2) To know the different cuts.
3) To know the meat, Bone ratio in sheep-goat at different cut.

3. Material Required :

1) Slaughter table
2) Slaughter equipments
3) Live animal (sheep/goat)
4) Weighting balance.

Relevant Information:

Here the term meat cutting may be defined the art- skill or craft of separation of carcass / wholesale prival (test) cut into different portion so as to suit various needs in the meat trade and to facilitate easy handling.

Meat cuts :

Following are the different cuts of meat.

1. Whole sale cuts :

It is an international method of dividing the carcass. In this method the division of carcass is into fore saddle (53 %) and Hind saddle (47 %) by cutting between two last ribs.

a. Fore Saddle :

It includes following part.

1) Neck : Cut at last-cervical vertebra, where it blends with shoulder.
2) Shoulder : Cut between 5^{th} and 6^{th} rib
3) Rack : Portion between 6^{th} to 12^{th} ribs
4) Breast : Cut forward from midway of last rib to ½ above elbow.
5) For shank : Cut the portion having fore shank bones.

b. Hind saddle :

1) Loin : Cut hind quarter by sawing in front of lip bone in between lan two lumbar v Vertebra.

2) Leg : Remaining portion of hind quarter.

3) Plan : Thin meat without bone from natural seam starting from breast.

4) Suel and kidney : In India people generally go for six cuts only neck, shoulder, rack fore shank and breast loin and leg.

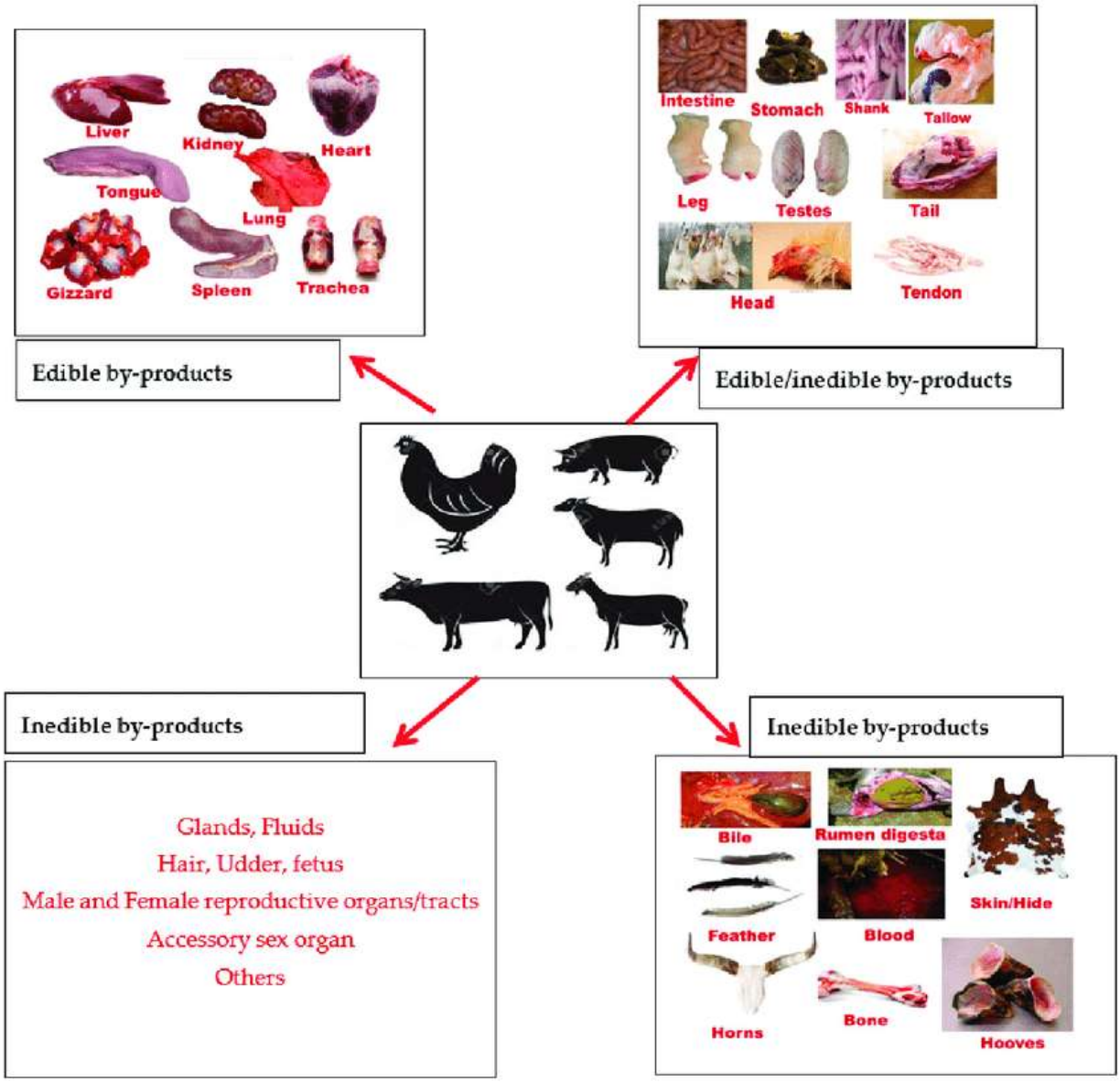
$$\text{Dressing \%} = \frac{\text{Carcass wt}}{\text{Live wt}} \times 100$$

Dressing percentage is offered by

a) Amount of ingesta filled in digestive tract
b) The fatness
c) Thickness of hide.
d) The amount of wool
e) Nutrition
f) Age
g) Castration

The final cuts are

Leg	-	30 %	Hind Saddle 47%
Loin	-	10 %	
Flank	-	3 %	
Rack Rib	-	10 %	Fore Saddle 53%
Shoulder	-	25 %	
Neck	-	4 %	
Shank	-	6 %	
Breast	-	8 %	



Observations :

Slaughter the animal, calculate the dressing percentage and record the meat bone ratio of different parts.

Questions :

1. What are the different factors affecting the dressing percentage?
2. How many cuts are in Indian method of slaughtering?

EXERCISE NO. 17

1. Title : Candling of eggs

2. Objective : To observe the growth and development of an embryo inside an egg

To put out a cool light rather than a lot of heat that might damage the embryos.

3. Relevant Information:

"Candling" an egg is the process of holding a light or candle near the egg to see the inner contents. It is used to see whether the egg is fertile or not. Looking at the color, shape, and opacity of the egg contents can help a farmer determine whether there is a chick inside or not. Small farmers who are incubating eggs to hatch chicks for their laying flock on their farm will need to candle the eggs periodically to check to make sure they are fertilized and growing well. Unfertilized eggs, called "yolkers," or embryos that have stopped growing, called "quitters," will rot, stinking up your incubator. They may also burst, contaminating the other eggs with bacteria.

It is also helpful to check on the eggs to see how the embryos are progressing. If you're selling eggs on the small farm, you may candle your eggs to determine their freshness. In this case, you will use a bright light, but just inspect the size of the air sac. Older eggs have larger air sacs. Selling only the freshest eggs is an important part of a small farm egg business, along with cleaning, collecting and properly storing the eggs.

Material Required :

Fresh eggs, bright light and dark room

Use the correct candling equipment:

Candling equipment doesn't need to be very fancy or specific - in fact, in the old days it used to be done with the flame from a candle. The main requirement is a bright light (the brighter the better) with an opening smaller than the diameter of the eggs you intend to candle. You will need to conduct the candling in a very dark room in order to see inside the egg.

- You can buy specific egg candling devices at any poultry supply store. These usually look like small flashlights which are powered either by batteries or a plug-in cord.
- You can make your own egg Candler at home by placing a 60 watt light bulb inside a coffee can and making a hole with a 1 inch (2.5 cm) diameter in the top of the can. Alternatively, you can take a very bright flashlight and cover the opening with a piece of cardboard with a hole (1 inch in diameter) in the middle.
- A more high-tech, expensive option for candling eggs is known as an Ovascope. This has a rotating stand on which you place the egg. The egg is then covered by a hood which blocks out any ambient light. You can then view the egg through an eyepiece, which magnifies the egg slightly for easier inspection

See if you can identify the following parts of the egg:

- Air sac
- Pores in the eggshell
- Yolk
- Blood vessels and/or a red ring around the yolk
- The embryo itself

"Winners," or fertilized, growing embryos, can be identified by a visible network of blood vessels if you're looking within the first week or at day seven. After that, you can see the eye, a shadow that indicates its body, and possibly even movement.
"Quitters," embryos that stop growing, will show a thin, red ring around the yolk. They may also show blood spots or streaks, though it can be hard to distinguish these from growing embryos. Remove these from the incubator.

"Yolkers," eggs that never got fertilized properly, will show no blood vessels, no ring, no spots in the yolk. Remove these from the incubator and throw them away (not good for eating).
Record your observations in a notebook, numbering each egg.
If you are unsure whether an egg is a winner or not, place it back in the incubator, but make note of the number so you can check it again.

1. Hold the egg above the light:

Set up your candling equipment in a dark room within close proximity to the incubator. Select an egg from the incubator and hold it above the light. The correct way to do this is as follows.

- Place the larger end of the egg (where the air sac is) directly against the light. Hold the egg near the top, between your thumb and forefinger. Tilt the egg slightly to one side and rotate until you get the best view.
- Should mark each egg with a number and take notes on your findings. That way, you can compare the results of your first candling with the results of your second candling.
- Try to work quickly, but not so fast that you risk dropping the egg. As long as the eggs are returned to the incubator within twenty minutes to half an hour, there is no risk of the candling process affecting their development. A mother hen will frequently leave her eggs for short periods of time while she is incubating them.
- Be aware that it will be more difficult to candle brown or speckled eggs as the dark shells do not become as transparent under the light.

2. **Look for signs that the egg is a winner:** A winner is an egg with a successfully developing embryo. You can tell if an egg is a winner using the following signs

- There will be a visible network of blood vessels spreading from the center of the egg outwards.
- With a weaker candler, you might just be able to make out the clear bottom half of the egg (where the air sac is) and the darker top half of the egg (where the embryo is developing).
- With a good candler, you might be able to see the dark outline of the embryo at the center of the network of blood vessels. You are most likely to see the embryo's eyes, which are the darkest spots inside the egg.
- If you're lucky, you might see the embryo moving!

3. **Look for signs that the egg is a quitter:** A quitter is an embryo which has stopped developing at some point during incubation, for one reason or another. Some quit due to poorly maintained temperatures or humidity, some are contaminated by bacteria, while others simply have bad genes.[10]

- The main indication that an egg is a quitter is the development of a blood ring. A blood ring looks like a well-defined red circle, which is visible on the inside of the shell. It forms when

the embryo dies and the blood vessels supporting it pull away from the center and rest against the shell.

- Other indications that an egg is a quitter include the development of blood spots or blood streaks inside the egg. However, these dark patches can be difficult to distinguish from a healthy embryo at this early stage.
- If you are 100% certain that the egg is a quitter (the appearance of a blood ring is a very definite sign) then you should discard the egg immediately to prevent it from turning bad and exploding inside the incubator.

4. **Look for signs that the egg is a yolker:** A yolker is an egg that was never fertilized and has no chance of developing an embryo. You can tell if an egg is a yolker using the following signs:

- The egg looks the exact same as it did when you first candled the eggs before putting them in the incubator.
- The inside of the egg looks fairly clear, with no visible dark spots, blood vessels or blood rings.

5. **If you are unsure, leave the eggs alone:** If you think you might have identified a yolker or a quitter, but are not 100% sure, do not discard them just yet. If you do, you run the risk of throwing away healthy eggs.

- Just make a note of which eggs have a question mark over them, then place them back in the incubator. It is always worth giving them another chance.
- Check the questionable eggs again on day fourteen. If there are still no obvious signs of development or if a blood ring has finally formed, you can discard them.

EXERCISE NO. 18

1. Title : Study of composition of Sheep and Goat milk and its product Preparation.

2. Objective : To study the composition of sheep and goat milk.

3. Relevant Information:

Goat milk has its own significance for home use. In rural area a majority of poorer sections fully depend on goat milk for domestic use. It has various important properties viz easily digestible, rich in protein and has essential minerals and fat soluble vitamins, small size fat globules, low fat, highly distributed fat globes and having essential nutritive value. It is useful for old and young ones.

The term market milk refers to fluid whole milk that is sold to individuals usually for direct consumption. It excludes milk consumed on the farm and that used for manufacture of dairy product.

Compositions:

a) Milk constituents:

The major constituents of milk are Water, Fat, Protein, Lactose and Ash or mineral matter.

The minor constituents are Phospholipids, sterols, vitamins, enzymes, pigments etc. The true constituents are milk, fat, casein, lactose.

b) Composition of milk :

The average chemical composition of milk of different species / sheep and goat.

Species	Constituents %				
	Water	Fat	Protein	Lactose	Ash
Cow (Crossbred)	86.54	4.50	3.37	4.92	0.67
Buffalo	82.76	7.38	3.60	5.48	0.78
Goat	87.10	4.25	3.52	4.27	0.86
Sheep	81.00	7.90	5.80	4.50	0.80

Factors Affecting composition of milk :

a) Milk differs widely for composition. Different milk contain the same kind of constituents but in varying amounts. Milk from individual goat / sheep shows greater variation than mixed flock milk. The variation is always greater in small flock than as large ones. In general milk fat shows the greatest daily variation as compare to protein followed by ash and lactose.

b) The factors affecting the composition of milk.

1) Species :

Each species milk yields of a characteristic composition.

2) Breed :

In general breed producing the largest amounts of milk yield but lower fat percentage is found in milk.

3) Individuality :

Each sheep / Goat tends to yield milk of a composition that a characteristic of the individual.

3) Interval of milking :

In general a longer interval is associated with more milk with a lower fat test.

5) Completeness of milking :

If the sheep / goat are completely milked the test is more. If not it is usually lower.

6) Frequency of milking :

Whether the cow / sheep / goat is milked two, three, or four times in a day it has not great effect on the fat test but milk yield will be increased.

7) Regularity of milking :

Frequent changes in the time and interval of milking result in lower yield.

8) Day to day milking :

May show variation for the individual sheep / goat.

9) Disease and abnormal condition:

These tend to affect the composition of milk as well as yield, also variation is found in composition

10) Portion of milking :

Fore milk is low in fat content (less than 1 percent) while stripping is highest (close to 10 percent). The other milk constituents are only slightly affected on a fat free basis.

11) Stage of lactation :

The first secretion after calving (colostrums) is very different from milk in its composition and general properties. The change from colostrum to milk takes place within a few days.

12) Yield :

For a single / sheep / goat there is a tendency for increased yield to be accompanied by a lower fat percentage and vice versa.

13) Feeding :

Has temporary effect only.

14) Season :

The percentage of both fat and solids not fat show slight but well defined variation during the course of year.

15) Age :

The fat percentage in milk declines slightly as the age of sheep / goat grows older.

16) Condition of cow/ sheep/ goat at Lambing / kidding :

If the sheep/ goat in good physical condition at lambing / kidding. It will more yield milk of a higher fat percentage than poor physical condition.

17) Excitement :

Both yield and composition of milk are liable or transient fluctuation during period of excitement for whatever reason.

18) Administration of Drugs and hormones :

Certain Drugs may affect temporary change in the fat percentage. Injection or feeding of hormones results in increase of both milk yield and fat percentage.

Observation :

Composition of studied milk sample.

Questions :

1. Write down the different factors affecting the composition of milk.

EXERCISE NO. : 19

1. Title : Goat milk and its products preparation.

2. Objective : To study the goat milk and its products.

3. Relevant Information:

Flavour :

Goat milk to be used for liquid consumption possess problem off flavour adversely affecting its acceptability. These flavours are affected usually due to two reasons. One of them is the high production of medium chain fatty acids, viz caproic capralic and capric in lipids of goat milk than in cow milk fat which impart typical undesirable flavour. When lactating does and bucks are kept together, the off flavour in goat milk is described as “goaty flavour”.

Goat Milk Product:

Use of goat milk for preparation of various dairy products is age old practice throughout the world. Some of the products are exclusively prepared from goat milk for instance cheese in Europe and Kefir in Russia, Greece and Franc has the largest goat cheese production. Goat cheese is while because due to goat milk lacks with carotene. In Spain, goat milk represents 11 percent of the milk used for cheese making.

Indigenous goat milk products:

A very limited research work on utilization of goat milk for preparation of Indian dairy products has been done so far.

1) Khoa :

Goat milk khoa had characteristic yellow colour slightly sticky texture. However it's pronounced salty taste made it unacceptable which is probably be due to a high chloride lactose. Khoa from goat milk tends to stick to the side of the pan and did not come off easily. This stickly character may be attributed to the fact that there might be no release of free fat in the final stage unlike khoa from cow and buffalo milk. This problem could also be solved by use of admixture of goat milk and buffalo milk in 1:1 proportion keeping minimum 5 percent fat and 9 to 10 percent SNF which also save satisfactory body and texture to the finished product. This khoa having 29.85 % moisture, 25 percent fat, 18.02 percent protein, 23.3 percent lactose and 3.5 percent ash, pedha prepared from this khoa was also satisfactory. Homogenization of goat milk tends to produce khoa with objectionable soft body, pasty texture and dull yellow colour.

2) Butter :

Butter made from goat milk is move or less comparable with cow milk butter except that the farmer is retained not-moisture which contributed for its soft. A weak body moreover the higher proportion of medium chain fatty acid as goat milk might be partly responsible for poor standup characteristics of this butter.

3) Chhana :

Gargoat (1976) found that goat milk chhana had softer body and smoother texture than that of cow milk chhana. Therefore, excellent quality Rasogolla could be prepared from goat milk.

While Jaikhani and De (1980) observed that there was no difference in chhana prepared from Goat milk and cow milk except that goat milk chhana was whitish colour. All desirable characteristic like soft body, smooth texture and acidic flavour needed for manufacture of chhana based sweets were found as goat milk product. Goat milk chhana contained 55.37 percent moisture, 23.52 percent milk fat, 17.26 percent protein, 2.21 percent lactose and 1.63 percent ash. Goat milk chhana is similar to that of cow milk chhana.

4. Curd, Chakka and Shrikhand :

Development of acidity in goat milk curd set by LF 40 culture was higher (0.87 %) as against cow milk curd (0.80 %). However volatile acid production in goat milk curd was

significantly low, the card tension of goat milk was also substantially lower (21.42) than that of cow milk (26.37 gm). However, sensorial goat milk curd scored equally well in comparison with cow milk curd. In surface appearance of goat milk curd was better due to bright shiny, white colour and smooth body without whey separation. It did not receive any adverse comments for flavour unlike milk rat of synergetic of goat milk curd was noticed slower and retained more moisture (71.48 %) in chakka as compare to cow milk chakka (45.43%). As result shrikhand was obtained from goat milk chakka though smother in texture as weak body of goat milk shrikhand therefore, higher moisture (49.88 %), than in the cow milk shrikhand (45.43%)

5. Ghee :

Largest (28 %) portion of milk produced in India is converted in to Ghee. In addition to its nutritional significance ghee has unique place in ayurvedic medicine and religious holy function one of the important sensory parameter is due to good quality of Ghee and its body and texture. Generally in ghee is value much which is decided by the composition a fatty acid profile in lipids. This is particularly depended on species of milk producing animal in addition as to many more other variable such as breed, feed, season, region, stage of lactation etc. proportion on soft and hard fat along with temperature of storage decided body and texture of ghee.

Proportion of lipids function in goat milk ghee was 2.4 to 2.6 times more than that of in cow and buffalo milk ghee the ratio of saturated glycosides to unsaturated glycosides was maximum in cow ghee (0.73) followed by buffalo ghee (0.69) and goat ghee (0.49). In other word goat ghee possessed maximum lipid function at ambient-temperature leading to its poor granularity.

Conclusion :

It could be concluded that, for preparation of indigenous milk products goat milk is equally good to that of cow milk. However for those indigenous products which need buffalo milk for their better quality. Even the quality of goat milk products might not reach to the level which is obtained for those bad exclusively from buffalo milk. In general it could be said that goat milk can confidently be used for preparation nearly all indigenous milk products of acceptable ability.

EXERSICE NO. 20

Title : Study of records on sheep and goat farm :

Objectives :

1. To study the sheep and goat farm records
2. To evaluate the sheep and goats
3. Selection of progeny for replacement and further breeding

Relevant information :

Sheep and goat records are the mirror of the breeding information of the flock. Selection of progeny for further improvement is made on the basis of the information. The records are generally deal with the information on the performance of individual animals. It helps in culling inferior, uneconomic stocks.

Precaution:

1. Information entered in the records should be checked for its correctness.
2. It should be reliable.

Material required:

All records to pertaining to various aspects of the sheep and goat.

Table 1. Individual ewe / doe history sheet

Ear No.	Flock No	Date of birth or purchase	Type of Birth single or twin	Description of the ewe doe	Particular of sire	Particulars of dam	Defects and abnormalities	Disposal particulars		
								Date	Reason	To whom

Table 2 kidding / lambing record

Date of birth	Ear/ tag No.	Sex	Birth Wt. Kg.	Type of birth	Sire	Conditions of birth	Wean		Disposal		Date of weighing	Age	Weight	Remark
							Age	Weigh	Date	How				

Table 3: Ewe / doe record

Ewe's / does no.	Sire's No.	Dam's no.	Age of dam at the time of ewe /doe was born	Date of the ewe / doe was born (kidding & lambing)	Birth weight	Type of Birth	Type of rearing ewe/ doe natural artificial	Age & weigh at weaning	Shorn fleece wt.	Body wt. Of ewe/ doe when her lambs/ kids were weaned	Her lamb/kid details in nut shell	Remarks healthy/ defective

Table 4. Ram/buck record

Rams /bucks no.	Sir's no.	Dam's no.	Age of dam when ram / buck was born	Date of birth (single)/twin	Type of rearing of ram/ buck artificial natural	Type of rearing of ram/buck artificial natural	Age of ram/buck at the time of weaning	Wt. Of ram/buck at the time of weaning.	Wt. Of ram/buck at one year of age	Shorn fleece wt.	Avg. performance of his progeny	Remarks

Table no. 5 Lamb/kid crop register

Year	Season	Date ram/ buck turned in	Date ram/ buck turned out	Ram buck used	Ewe/doe no.	Lambing/ kidding date	Lamb/ kid no.	Sex	Birth wt.	Type of birth	Nursed by ewe/ doe	Date of weaning	Date of calf ration	120 days wt.	Market wt.	Disposal how?	Disposal date	Remark

Table 6 Wool production (use one line for each year

Date of shearing	Days of wool growth	Sides		Shoulder		Belly		Thigh		Total Yield	Grease wt.	Percent of yield	Clean wt.	Remark
		Fine ness	Yield	Fine-ness	Yield	Fine ness	Yield	Fine ness	Yield					

Table No. 7 : Health and other information

(Record facts like dipping, veterinary aid, vaccinations, udder conditions, abortions etc.)

Date	Remark

Table No. 8 : Slaughter data (Slaughtered for meat)

Date	Live wt. kg	An time of features	Dressed wt.	Dressing %	Wt. of skin	Remarks

Table No. 9 : General information sheet

Date	Animal/flock No.	Information (Disease, vaccination, identification, deworming etc.)

Observations :

Compare the different records maintained on your sheep and goat farm with the above specimen proforma given to you and find out the difference if any.

Questions :

1. State the importance of record keeping on sheep / goat farm in brief.
2. List out the different records maintained on goat farm.

EXERCISE NO. 21

Title: Proposal for sheep and goat unit

Objectives : To prepare Proposal for sheep and goat unit
(Under stall fed condition for 100 goats + 5 male)

L **Capital Expenses**

A) **Purchase of 100 does and 5 males**

(pregnant does should be purchased, which are going to kid-for the first time)

Doe	-	2500x100	2,50,000
Buck	-	3500x5	1,75 000
		(A)	**4,25,000**

B) **Construction of shed** :

Each goat will require
10 sq,ft-area in shed
and 20-sq.ft-for outside
Total area for 105 animals = 1050 sq.ft-
opened area - 2100 sq.ft .

Cost of construction (Rs;500/sq.ft)	
500x1050	5,25000
Opened space.	
80' x 27'	
Total running 214 feet,	
Rs. 150/-running ft	32,100
Provision of water sheds	
1.5' x 6' water cement pipes	10.000 = 00
Each of Rs. 2000/	
Total 5 pipes	
Total B	**5,67000=00**
Total A+ B	**9,92000 = 00**
Say	**(9,92000 = 00)**

II) Recurring Expenses:

A) Labour charges:

2 labours x 3000/p.m 6000 = 00

(1 in day and 1 at night)

B) Feeding Expenses:

A) Concentrate

I) It is necessary to give some quantity of concentrate

(250gm /day/goat

250X105X365 = 95.81 Qt Say 96 qt

96 qt X@ Rs. 1900/qt = Rs. 1,82,400=00

B) Fodder :

Dry Matter required 4 %

Avg body weight - 30kg

Total DM required - 1.2 kg

DM from concentrate 225 gm (90%)

DM from fodder 1125 gm

1/3 from green fodder 375 gm from green

2/3 from dry fodder 750 gm from dry

Green fodder

1875 gm daily

1875 x 105 x 365 = 718 Quintal / year

Out of these 30 % will be available from tree leaves

i.e. 215 gm

718-215 = 503 qt cultivated fodder

503 x 150 (Rs. 150 / qt) = Rs.75,450 = 00

Dry fodder

800 gm daily

800x 105x365 = 318 Quintal/year

318x100(Rs.l00/qt)= **Rs.31,800 = 00**

C. Feeding expenses for kids :

I. Concentrate.

75 gm/kid/day

75 x 118 x 240 = 21.24 say 21 qt

Kid will be fed From fourth month onwards for

total 8 months i.e. for 240 days)

21 x 1900 39,900-00

Kid will be fed on available tree leaves so no separate expenses for fodder

3) Health cover Rs. 20,000=00

Total expenses (1+2+3)

= 6000+182400+75450+31800+39900+20000

Say 355550=00

Income :

i) Av. body weight of kid at one year 25 kg

25 x 59= 1475

Rate 225/kg (live wt.)

225 x 1475 = 331875=00

2) sale of manure

Av.200 kg faces from adult /year

20kg from kid/year

200 x 105 = 210 qt say 21 tones

20 x 108 2160 say 2 tones

Total 23 tones of faces

Rate Rs.5000/tones

23 x5000 = Rs.1,15000

3. Sale of empty gunny bags

Total feed 117 Quintals

Each bag 65 kg

Total bags 180

Cost of empty bags Rs. 50 / bag

Total **9000**

II. Sale of skin

Animal death 12

Rs.200 / Skin 2400 = 00

iii. Each year 20 % sale of female goat (Replacement)

20 x 4500 = 90,000=00

Total

1+2+3+4+5 = 548275=00

Recurring expenses 355550=00

For 100 goats = Rs.192725=00

For one goat-1927.50 say 1930/year

EXERCISE NO. 22

Title: Minimum requirement for Sheep and Goat Meat Export

2) Objectives :

1. To study the food safety standards in India.
2. To study the legal frame work in India for safety standards of meat

3) Relevant information

Food safety is a concept that food will not cause any harm to the consumer when it is prepared and eaten according to its intended use. A wide majority of the food related issues go unnoticed and undocumented. In spite of under reporting, the available epidemiological data itself necessitates establishment of standards with a reference to the microbiological criteria for meat, fresh and poultry products.

Meat export is largely driven by sheep and goat meat. Which is growing at close to 30 per cent per annum in terms of quality. It is considered that the growing number of fast food outlets in the country has and will have a notable impact on the meat processing industry

Various industries and agencies undertake the activities related to microbiological criteria for meat and food products i.e. the limits of microbiological parameters are specified in the respective Indian standards, which are elaborate the Bureau of Indian Standard (BIS) has formulated standards on test methods for detection and enumeration of pathogenic microorganisms in food and specifications for ingredients used in media for microbiological works.

In the domestic market there are number of legislations that becomes relevant to the food processing in its entire chain perhaps terminating at the global market. The most important legislative initiatives can be summarized (i.e. Ministry of Agriculture).

- Inspect act
- Milk and Milk Product Control Order (MMPO)
- Meat food product-order (1973)

4) Precaution : Meat to be exported should be critically observed for the microbiological standards given by Food Adulteration Rules,

Prevention of food adulteration

Goat meat and it's products has following criteria.

Total plate count	:	1000/gram maximum
E coli	:	Absent in 25/gram
Salmonella	:	Absent in 25/gram
Stephylacoccus aureus	:	Absent in 25/gram
CL perfringens and CL. Botulinum	:	Absent in 25/gram

Frozen mutton of goat meat

Total plate count	:	10,000/ gram maximum
E coli	:	100/ gram maximum
Salmonella	:	Absent in 25/gram
Staphylococus aureus	:	100/gram maximum
Perfringens and	:	30/ gram maximum
CI. Botulinum		
Listeria monocylogenesis	:	Ascent in 25/gram
Yeast and mould count	:	1000/gram maximum

5) Materials required

The mutton should be exported should be brought to the food testing labs for the bacterial study.

There are 72 food labs under the administrative control of central and state governments as well as local bodies.

Central food labs

Four central food labs have been established under PFA act to serve as appellate labs. The samples of food articles taken by food inspectors from state and local levels are tested two of these jabs. The food research and standardization labs, Ghaziabad and Central food labs, Kolkata are under the administrative Center 1 of the directorate general of health services. The other two Central Food Labs (CFL), Pune and food central lab, Mysore are under the administrative control of government of Maharashtra and council of scientific and industrial research. In addition to this there are 84 state food labs and one third are under the administrative control of local bodies.

Laboratory analysis

The establishment of specification and standards is meaningless without laboratory analysis or an evaluation programme. Laboratory analysis is the phase in which a quality control programme is implemented after product is produced. A sampling plan, along with an analysis frequency (time schedule defining how often analysis are made) is absolutely necessary complies the methods of analysis used in the laboratory in a special working note book. Microbiological, chemical and physical analyses of food are available in the book. Official methods of analysis, published by the associative of official analytical chemists.

6) Observations

The sample of the mutton should be observed for the different analysis.

7.1 Questions

1. What is food safely?
2. What are the legal frame works of India with respective microbial standard of meat.

EXERCISE NO. 23

Title: Vaccination Program of Sheep, Goat and Poultry

2) Objectives :

1. To study vaccination program.
2. To maintain the heath, physical and mental well.
3. To maintain function properly in healthy animal

3) Relevant information

Certain diseases are too widespread or difficult to eradicate and require a routine vaccination program. In general, all flocks should be vaccinated against Marek's Disease, Newcastle Disease, Infectious Bronchitis, Infectious Bursal Disease (IBD; Gumboro), and Avian Encephalomyelitis (AE). The exact vaccination schedule depends upon many things such as disease exposures expected, maternal immunities, vaccine types available, and routes of administration preferred. Therefore, no one program can be recommended for all locations and situations. Consult with local veterinarians to determine the best vaccination program for your area. Following is a basic program where breeders received an inactivated Newcastle-Bronchitis-IBD vaccine.

VACCINATION SCHEDULE POULTRY

Layers

Age	Name of Vaccine	Dose	Route
5-7th day	Lasota	-	I/R or I/O
14-16th day	I.B.D.	-	I/O or D/W
24-26th day	I.B.D. (booster)	-	D/W
30th day	Lasota (booster)	-	D/W
7th week	Fowl Pox	0.2 ml.	I/M
9th week	Deworming	-	-
10th week	R2B	0.5 ml.	I/M
15th week	Debeaking	-	D/W
17th week	Lasota	-	-

Broilers.

Age	Name of Vaccine	Dose	Route
3-5th day	Lasota	-	I/O or I/n
7-9th day	I.B.D.	-	I/O or D/W
16-18th day	I.B.D. (booster)	-	D/W
24-26th day	Lasota (booster)	-	D/W

Note : I/N – Intra Nasal; I/O – Intra Occular; D/W – Drinking water; I/M – Intra Muscular

Vaccination schedule for sheep and goats-

Sr. No	Name of Disease	Time Table	
		Primary vaccination	Regular Vaccination
1.	Anthrax	At the age of 6 month for kid or lamb	Once Annually(In Affected area only)
2.	Haemorrhagic Septicemia (H.S.)	At the age of 6 month for kid or lamb	Once AnnuallyBefore monsoon
3.	Enterotoxaemia	At the age of 4 month for kid or lamb (If dam is vaccinated) At the age of 1st week for kid or lamb (If dam is not vaccinated)	Before monsoon (Preferably in May) Booster vaccination after 15 days of first vaccination.
4.	Black Quarter(B.Q)	At the age of 6 month for kid or lamb	Once Annually(Before monsoon)
5.	P.P.R.	At the age of 3 month for kid or lamb & above	Once in three years
6.	Foot & mouth disease(F.M.D.)	At the age of 4 month for kid or lamb & above	Twice in a year (September & March)
7.	Sheep Pox	At the age of 3 month & above for lamb	Once Annually (December month)
8.	Goat Pox (Vaccine is not available in Maharashtra)	At the age of 3 month & above for Kid	Once Annually(December month)
9	C.C.P.P.(Vaccine is	At the age of 3 month & above for Kid	Once Annually(January month)

Disease Prevention/Control:

1. Clean sanitary conditions of poultry sheds and equipment, balanced feed, fresh clean water, healthy chicks are essential to prevent diseases.
2. Avoid entry of visitors to farm, especially inside the sheds. If visitors come, ask them to dip their feet in a disinfectant solution, wash and clean hands and to wear apron/boots provided by the farm.
3. Use proper vaccination schedule
4. Use high quality vaccines purchased from reputed manufacturers. Keep vaccines in cool, dry conditions away from sunlight.
5. Any left-over vaccine should be properly disposed off. Vaccines should not be used after their expiry date is over.
6. Any dead bird should be immediately removed from the shed and sent to laboratory for post-mortem or buried/burnt suitably away from the poultry sheds.
7. The waste of farm should be suitably disposed off.

8. Any bird showing advanced signs of a disease should be removed from the shed and culled. It can be sent to laboratory for diagnosis.
9. Birds showing advanced signs of a disease should be shown to a qualified veterinarian and suitable medication/treatment be given as per his/drug manufacturers recommendations.
10. Poultry manure, if infected, can spread disease, from one batch to another. Keep the litter dry, remove it after flock is sold and dispose the manure properly and quickly.
11. Keep proper records on mortality and its causes and the treatment given to birds. Dates of vaccination for each flock should be properly recorded.
12. Rats are important carriers of poultry disease. Avoid rats. Use suitable rat poisons/rat traps.
13. Many poultry medicines can be given in drinking water. When medication is to be given, remove the waterers in poultry sheds on the previous evening. Next morning give medicine in measured quantity of water, so that entire medicine will be quickly consumed and there will be no wastage of medicines.
14. Mild infection of disease may not cause mortality but it will reduce growth. Keep sample record of body weight and mortality rate. Study the possible causes, if weight is low take steps to improve the management of the subsequent batches. A Constant visit and analysis of records/results is necessary to keep up the efficiency in farming.

EXERCISE NO. 24

Title: Visit to Sheep, Goat and Poultry Farm

(Record observations as per instructions of Course Teacher during visit to Sheep, Goat and Poultry farm for Examples: Date of visit, Name of farm, address of farm, Details of animal/ poultry, Breeds, Breeding observations, Feeding observations, Adoption of management practices, Type of shed for sheep, goat and poultry, Health aspects, Production and Disposal, Mechanization, Balance sheet and Economics of farm, etc.)

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Certificate

This is to certify that Shri / Ku. _____

Enrolment No. _____ has completed the practical of course No. AHDS-364 (Sheep, Goat and Poultry Production), as per the syllabus B.Sc. Agri. (Hons) Third Year Sixth Semester in the laboratory of College as prescribed by M.C.A.E.R. Pune.

Date: **Course Teacher**

Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola

College of Agriculture, Akola

Practical Manual

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SHEEP, GOAT AND POULTRY PRODUCTION

Course No. : **AHDS-364 (New)** Credit: 1 + 1 =2

Semester: **VI** Term: **II** Academic Year: _____

Name of Student: _____

Enroll. No._____ Batch: _____