PRACTICAL MANUAL

For

I B.Sc.(Agriculture)

AMP 101 Fundamentals of Livestock & Poultry Production

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Certified that this is bonafide record of work done by _____of the First year B.Sc., (Agri.) Course AMP-101 Fundamentals of Livestock and Poultry Production during the Second Semester of the Year 200 - 200 .

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EXTERNAL EXAMINER **COURSE TEACHER**

INDEX

Name of the Student _____
I.D.No._____

Ex. No.	Date	Name of the Exercise	Date of Submission	Initials of Teacher
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3.		IDENTIFICATION OF LIVESTOCK AND POULTRY		
4.		DISBUDDING, DEHORNING, CASTRATION AND DENTITION OF LIVESTOCK		
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16.		DEMONSTRATION OF DRESSING CHICKEN FOR TABLE.		
17.		FINAL PRACTICAL EXAMINATION		

Ex.No:1. **EXTERNAL PARTS OF CATTLE**

Date:

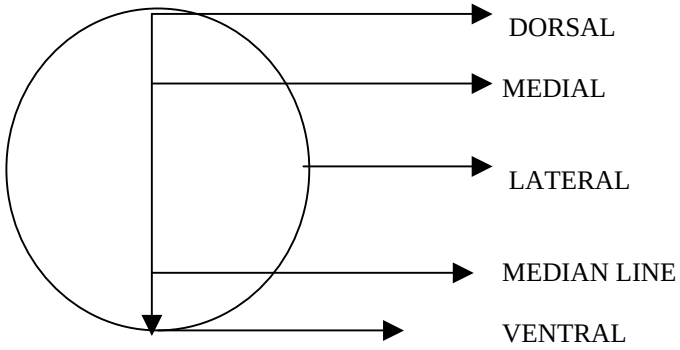
Aim: To study the external parts of cattle

Importance

1) It is highly essential for a farm manager who maintains various livestock.
2) The female stock are maintained either for production of milk or reproduction of calves while the male stock are for the farm chore or for the transport of produce, ploughing etc.,
3) Identification of external parts of an animal is essential /necessary in describing the animals in case of ailment.
4) Judging and selection of animals is on the basis of physical traits for which knowledge of external parts is essential.
5) Preparation of Veterinary documents and certificates.
6) It helps in carrying scientific studies.
7) It is essential to apply the various husbandry practices.

Depending on the position the following terminologies are followed:

Dorsal- Upper side, Ventral- Lower side
Medial- Close to the central line, Lateral - Away from the central line



Precautions to be taken while approaching the animal

1) Be careful while approaching the unknown animal and approach with caution.
2) Approach the animal on the left side which is usually referred as "NEAR SIDE" and right side is referred as "OFF SIDE".
3) Approach the animal on the sides especially around the neck region.
4) Do not forget to pat the sides of the animal in order to win its confidence.
5) Do not excite the animal.
6) Try to convince the animal by provision of certain eatables viz.: green grass etc.,
7) Try to get information from the owner about the vices of his/her animal.
8) It is always beneficial to have the owner by the side of his/her animal.
9) It is preferable to restrain the animal before examination with a rope (or) trevis.

External Parts can be studied under the following five headings

a. Head. b. Neck. c. Fore Quarter. d. Body or trunk. e. Hind Quarter.

a. Head

i.Poll. ii. Fore head.

The fore head is bounded dorsally by the poll; Ventrally by an imaginary line drawn between two inner canthus of eyes and laterally by the imaginary line drawn from base of the ear to the outer canthus. The fore head shape will vary depending on the breeds (e.g.) in case of Jersey it is dished, in Holstein Friesian it is flat and there is a inverted triangular white patch, while in Murrah Buffalo it is convex with tough bristles.

iii. Nasal Bridge.

It extends from the base of the forehead to that of a coloured area in the upper jaw (i.e.) Muzzle. The nasal bridge is dished in case of Jersey; in Holstein-Friesian it is flat; in Tellicherry Goat it is elevated "Roman Nose".

iv.Muzzle.

It is a non-elastic pigmented area devoid of hair. The muzzle will give an indication about the health of the animal. In the case of healthy cattle it is moist while in the sick animals it is dry and vice versa in case of horses.

v.Nostrils.

The external opening of noses (or) openings of the respiratory tract are present on either side of muzzle. The examination of nostrils will give an idea about the respiratory tract of the animal. The nostrils should be free from discharge. The nostrils are laterally placed in case of ruminants while in the pigs it is medially placed.

vi. Horn-Base, Body and Tip
vii. Eye: Upper eyelid, lower eyelid, eye lashes, inner canthus, outer canthus & nictitating membrane (or) third eye lid.
viii. Ear: base, body, & tip.
ix. Upper jaw. (Maxilla).
x. Lower jaw. (Mandibles) -

Rami of the mandibles are present on the lateral aspect of the lower jaw. In between the rami of the mandible the forefingers can be inserted-that area is referred as "Jowl". In the case of animal having endo parasitic infestation there is edema development and is referred to as “bottle jaw condition”.
xi. Cheek.
xii. Chin.
xiii. Buccal Cavity: Upper lip, lower lip, Buccal papillae, Tongue: base, body and tip. Taste buds,
Xiv Teeth: Incisors, Inter dental space, pre molars, molars, dental pad.

b.Neck.

i. Dorsal border. Very close to the inner aspect of dorsal border there is "Ligamentum Nuchae" ii. Ventral border. iii. Base of the neck. iv. Top or cranial border. v. Sides. vi. Crest. vii. Jugular furrow: Jugular vein. In case of ailing ruminants fluid therapy is given in this vein while in pigs it is given in the ear vein. viii. Dew lap.

c. Fore Quarter.

i .Hump (or) withers. ii. Shoulder. iii. Shoulder joint. iv .Point of Shoulder. v. Arm. vi. Elbow joint. vii. Forearm. viii. Knee joint. ix. Forecannon. x. Fetlock joint. xi. Pastern. xii. Coronet. xiii. Hoof: Inner digits, outer digit, inter digital space, Bulbs of the heel, Sole. xiv. Back of the fore arm. xv. Bend of the knee. xvi. Back of the fore cannon. xvii. Dew Claws (or) rudimentary digits.

Joints of Fore Quarter: 1.shoulder. 2.elbow. 3.knee. 4.fetlock.

d.Body (or) Trunk

i. Dorsal Border: Back, Loin, Rump (or) Croup.

ii. Sides of the Body: Heart Girth (Circumference just posterior to the shoulder), Side of the chest, side of the abdomen, hollow of the flank, flap of the flank.

iii. Ventral Border: Brisket, Floor of the chest, floor of the abdomen, umbilicus.

In case of male: Prepuce, testicles, and rudimentary teats. In case of female: Udder (or) Mammary Gland, Right & Left Quarters-Fore & Hind Quarter. Mammary Vein, Wells of the vein.

e. Hind Quarters

i. Hip joint. ii. Thurl. iii. Stifle joint. iv. Tendo Achilles (or) Ham string. v. Hock joint. vi. Hind cannon. vii. Fetlock joint. viii. Pastern. ix. Coronet. x. Hoof: Inner digit, Outer digit, and Inter digital space, Bulbs of the heel, Sole. x. Point of buttocks. xi. Point of Hock. xii. Back of the hind cannon. xiii. Dew claws. xiv. Tail: Base, body and switch. Below the base of the tail there is anus and in female vulva.

Joints of the Hind Quarter: Hip, Stifle, Hock and Fetlock.

The body weight of the animal can be determined using the following formula;

White Cattle

Weight of the animal (Kg.) = $L \times G^2 / 300 \times 2.2$

L. refers to the Length of the animal in inches. The length of the animal is ascertained by taking the measurement from the point of shoulder to point of the buttocks.

G. Refers to the Heart girth.

In case of **Buffaloes** : The body weight is calculated using the formula: G X L / Y.

The weight of the animal is calculated in "SEERS" One "Seer" is equivalent to 0.93 kgs.

G: Girth of the animal in inches. L: Length of the animal in inches.

Y: is a constant: When the girth of the animal is below 65” Y is "9.00"

When the girth is between 65 and 80” Y is "8.50"

When the girth is above 80” Y is "8.00"

Glossary of Livestock Terms

Source : Livestock Husbandry Techniques by J.I.McNitt

Abort : to expel the foetus prematurely.
Afterbirth : membranes surrounding the foetus in the womb. This is expelled after the foetus during the birth process. Also known as **placenta**.
Antiseptic : a substance used to kill harmful organisms on the skin surface.
Artificial insemination (A.I.) : The technique of artificially introducing the semen of the male into the reproductive tract of the female.
Avian : a generic description of birds in general.
Beef: Meat from Cattle
Bloat : the build up of gas in the rumen of cattle, sheep, and goats. The gas is usually entrapped in bubbles and cannot be expelled normally by belching.
Boar : an intact male pig.
Bovine : a generic name for cattle.
Brand : a marking placed on the hide of an animal by applying extreme heat, cold, paint or caustic materials.
Breed : a group of animals with distinct shapes and colours which produce offspring with similar shapes and colours.
Broiler : a chicken of either sex raised especially for meat purpose and marketed at about 1.8 kg live weight.
Broken-mouth : a mouth having teeth missing. Usually applied to sheep or goats and occurs with old age.
Buck : an intact mature, male goat .
Buckling : an intact, immature male goat.
Bull : an intact male bovine.
Calf : a young bovine of either sex.
Calving interval : the length of time from one calving to the next.
Capon : a male chicken whose reproductive organs have been removed or rendered inactive while the individual is still young.
Cattle : animals of the family Bovidae, genus Bos.
Chevon: Meat of goat
Cock : mature male chicken.
Cockerel : young, growing male chicken.
Concentrate : feedstuff low in fibre and high in digestible nutrients.
Cow : a mature, female bovine having had at least one calf. (a cow between her first and second calves is often known as a 'first-calf heifer'.)
Creep : an enclosure to which only the young of the species have access so they may be fed separately from the adult stock.
Creep feed : to provide special feed for the young; also, the feed provided for the young within a special enclosure.
Crossbred : the offspring resulting from the mating of a male and female of different breeds.
Cull : to dispose of the poorer animals in a herd or flock.
Dam : the mother of an animal.
Debeak : to cut off a portion of the upper and lower beaks of poultry to prevent cannibalism.
Disbud : to remove or prevent growth of the horn buds in young livestock.
Disinfectant : a substance used to kill harmful organisms on non-living surfaces.

Dock : to remove all or part of the tail.
Drench : to give liquid medicines orally to animals.
Dub : to remove the comb in chicks.
Elastrator : an instrument used to place strong rubber bands over the scrotum of tail for castration or docking, respectively.
Emasculator : an instrument used to sever the cord connecting the testes to the body.
Equine : a generic name for horses.
Ewe : a mature female sheep.
Farrow : to give birth to piglets.
Flank (n) : the part of the animal just in front of the hind leg.
Fleece : the total wool coat of a sheep.
Flock (or) herd : a group of animals (sheep, goats & birds).
Flush : to increase feed level of females prior to breeding to increase ovulation rate.
Full-mouth : a sheep or bovine that has all its permanent incisor teeth intact and fully developed.
Gilt : a female pig prior to her first litter. (The first litter is sometimes referred to as a 'gilt's litter')
Hay : dried grass or legumes stored for winter fodder.
Heat : period when the female will accept service by the male ; oestrus.
Heifer : female bovine before its first calf.
Hen : a mature avian female.
Kid : a young goat of either sex.
Lactation : the period of time that an animal is in milk.
Lactation interval: the period of time from the beginning of one lactation to the beginning of the next.
Lamb : a young sheep which is suckling.
Litter : material placed on the floor to absorb moisture (esp. in poultry) or a group of young born to one mother at one time (swine, rabbits).
Live weight : the weight of an animal before it is slaughtered.
Mutton : meat from mature sheep.
Natural service : insemination of the female by the male.
Needle teeth : small, sharp teeth, that piglets have at birth – also called 'wolf teeth'.
Ovine : a generic name for sheep
Ox : a castrated male bovine used primarily for draught purposes.
Parturition : the process of giving birth to young.
Placenta : see Afterbirth.
Point-of-lay : the time at which pullets begin to lay eggs. Usually 18 to 20 weeks of age.
Porcine : a generic name for pigs.
Pork: Meat from Pigs
Pullet : female chicken up to the completion of the first laying season.
Purebred : the offspring of the mating of a male and female of the same breed.
Ram : a mature, male sheep.
Restrain : to stop the movements of an animals so it can be examined or treated.
Rotational grazing : the regular, cyclic use of pastures to promote grass growth and combat parasite infestation.
Ruminant : a member of the class of animals having a four chambered stomach (cattle, sheep, goats, deer, etc.).
Semen : the discharge ejaculated from the testes and accessory sex glands of the male which includes sperm and accessory fluids.
Scour : diarrhoea – may be caused by diet or disease.

Service : the insemination of the female.
Sire : the father of an animal.
Silage : green plant materials which have been preserved by fermentation.
Sow : a female pig which has had at least one litter.
Steam up : to give extra feed to a milk-producing animal which is poorly nourished or diseased.
Sterilise : to treat instruments etc. with heat or chemicals to destroy harmful organisms.
Strip cup : a small cup used for checking for mastitis in dairy cows prior to milking.
Subcutaneous : describes injections given just under the skin.
Supplement : feed provided to livestock in addition to grazing.
Swine : a collective name for beasts of the genus *Sus* kept for meat purposes.
Teat : the appendage, which the young animal suckles, which are attached to, and part of, the mammary gland.
Tusk : elongated or enlarged permanent canine tooth. Usually seen in boars.
Udder : the milk-producing, glandular tissue of the female.
Vaccinate : the injection of material into an animal to promote long lasting immunity in the animal or, at least, the ability to tolerate a disease.
Vice : a habit or action of animals that is detrimental to themselves or others e.g. cannibalism in poultry or tail-biting in swine.
Wean : to separate the young from the mother so they can no longer suckle.
Wether : a sheep castrated at an early age.
Worming : to give medicines to kill worms parasitising the animal(Deworming)

Common Terminologies used in Animal Husbandry

Particulars	White Cattle	Black cattle	Sheep	Goat	Pigs	Poultry
Species	Bovine	Bubalines	Ovine	Caprine	Porcine	Avian
Group	Herd	Herd	Flock	Flock	Band	Flock
Adult Male	Bull	He Buffalo	Ram	Buck	Boar	Cock
Adult Female	Cow	She Buffalo	Ewe	Doe	Sow	Hen / Layer
New Born	Calf	Calf	Lamb	Kid	Piglet	Chick
Male Young	Bull Calf	Bull calf	Ram Lamb	Buck kid	Boarling	Cockerel
Female Young one	Heifer	Buff. Heifer	Ewe Lamb	Goat kid	Gilt	Pullet
Castrated Male	Bullock	Buffalo Bullock	Wedder/ wether	Castrated	Stag	Capon
Castrated Female	------SPAYED-----					
Act of Mating	Servicing	Servicing	Tupping	Servicing	Coupling	Mating
Act of Delivery	Calving	Calving	Lambing	Kidding	Farrowing	Hatching / Laying (Ovi position)

Ex.No : 2. Economic Traits of Livestock and Poultry
Date :

CATTLE

Age at first calving	
Lactation length	
Lactation yield a. Lactation yield for 305 days 1.Daily milk record is available 2.1 Day in a week stripping 3.Lactation length shorter than 305 days 4.Lactation longer than 305 days	
Dry period	
Inter calving period	
Peak yield	
Average fat %	
Service Period	
Breeding efficiency	

GOAT

Birth weight of kid (Kgs.)	
Weaning weight of kids (Kgs)	
Weaning age (days)	
Weight at 1st conception (kgs.)	
Weight at 1st kidding (Kgs.)	
Half yearly weight gain (Kgs.) a) 3 months to 1 year old b) 1 year to 2 years old c) 2 years to 3 years old	
Adult doe weight (kgs.)	
Age at 1st conception	
Length of Oestrous cycle (days)	
Age at 1st kidding (months)	
Kidding Percentage (Does kidding / does mated)	
Length of Gestation (Days)	
Twinning percentage	
No. of services per conception	

SHEEP

A. Body Weight 1.Birth Weight 2. Weaning Weight 3. 6 months weight 4. 9 months weight 5. Yearling weight	
B. Greasy Fleece weight 1. first 6 monthly 2. 2nd 6 monthly 3. Adult annual	
C. Medulation	
D. Average fibre diameter	
E. Reproductive performance 1.Tupping percentage	
F. Lambing percent on the basis of ewes available	
G. Lambing percent on the basis of ewes tupped	
Mortality and culling	
Pre weaning mortality percent	
Post weaning mortality percent	
Adult mortality percent	
Pre weaning culling percent	
Post weaning culling percent	
Adult culling percent	

SWINE

1. Litter size at birth	
2. Weight at Birth (Kgs.)	
3. Weaning weight (Kgs.)	
4. Litter size at weaning	
5. Weight at 154th day	
6. Weight at 210th day	
7. Growth rate a) Birth to weaning b) Weaning to 154 days c) Weaning to 210 days 8. Feed efficiency a. weaning to 154 days b. weaning to 210 days	Weaning weight – Birth weight (Kg) / 56 Weight at 154th day – weaning (Kg) / 98 Weight at 210th day – weaning (Kg) / 154
9. Mortality percentage a) Birth to weaning b) 57 days to 1 year c) Adults (above 1 year)	

LAYER

1. Hatch weight	
2. Weight at 20 weeks	
3. Livability (0 to 20 weeks)	
4. Age at maturity	
5. Weight at maturity	
6. Laying performance a) the first egg in the flock was received b) 30 percent production (on hen day basis) c) 50 percent production (on hen day basis)	
7. 36 weeks production	
8. 72 weeks production	
9. a) Hen day production to 36 weeks (%)	Total No. of eggs received to end of 36 weeks / hen days x 100
b) Hen housed production to 36 weeks	Total No. of eggs laid by a flock to the end to 36 weeks / No. of hens housed at 20 weeks
10.a)Hen day production to 72 weeks (%)	Total No. of eggs laid by a flock to the end to 72 weeks / Hen days x 100
b) Hen housed production to 72 weeks	Total No. of eggs laid by a flock to the end to 72 weeks / No. of hens housed at 20 weeks
11. Livability (20-72 weeks)	
12. Feed efficiency a) Feed consumed (kgs) per dozen egg production b) Feed consumed (kgs) per Kg. egg production	
13. Hatchability a) Fertility b) Hatchability per cent of fertile eggs set c) Hatchability per cent of all eggs set	

BROILER

1. Hatch weight	
a. 1st week weight	
b. 2nd week weight	
c. 3rd week weight	
d. 4th week weight	
e. 5th week weight	
f. 6th week weight	
2. Feed intake in grams	
a. 1st week	
b. 2nd week	
c. 3rd week	
d. 4th week	
e. 5th week	
f. 6th week	
3 Feed intake 0- 3 weeks	
4. Feed intake 4 – 6 weeks	
5. Feed conversion ratio a) 0- 3 weeks b) 3-6 weeks c) 0-6 weeks	
6. Mortality percentage a) 0-3 weeks b) 3-6 weeks c) 0-6 weeks	
7. Dressing percentage	

EX.NO.3 IDENTIFICATION OF LIVESTOCK AND POULTRY

Date:

Aim : To study about the different methods of identification of Livestock and Poultry.
a) Tattooing b) Ear tags c) Wing band and d) Leg band.

Purpose / Importance

1) It is primarily essential for the management of a good herd of animals and also it is essential for the herd improvement.
2) It solves the disputes over lost or stolen animals by establishing the ownership.
3) It is essential for the recording of production performance.
4) It is also necessary for getting recognition in Associations like Dairy Herd Improvement Association. (DHIA)
5) It is also required for culling and disposal of uneconomical animals.
6) It is necessary to find out the progeny or off springs, which are born by artificial insemination.
7) It is also required for giving health and vaccination certificates especially when they are transferred from one place to another.
8) It is essential for insurance of livestock against the loss either by disease or by accidents.
9) It is also needed for disease control programs-to identify the affected and carrier animals.(T.B., Brucellosis).

Method of Identification

It is mainly classified into 2 types.
1.New methods 2. Old methods (or) obsolete methods.

New methods are classified into 3 types.
1.Tattooing 2.Tags 3.Bands

Old methods are classified into 3 types.
1. Branding 2. Photograph 3. Ear notching

New Methods

1. **Tattooing**

It consists of piercing an outline of desired number or letter on the skin inside the ear and vegetable ink is applied into the holes.

The tattoos are permanent and easy to apply by an experienced farmer. Various letters or figures are outlined by steel. Each of these will carry the small quantity of the ink or pigment into the subcutaneous tissue or cartilage of the ears when it pierces.

Tattooing is done for the newborn calves, young piglets, lambs etc. When tattooing is done properly it results in permanent and clear figures or markings. The tattooing is done with tattooing forceps, tattooing ink and with the series of letters from A to Z and figures 0-9. With these, imprints are made on the inner aspect of the ear avoiding the major ear veins.

Procedure

Clean all the wax and dirt thoroughly by washing with soap and water and completely wipe it dry. Clean the surface with rectified spirit.

Now apply the tattooing ink liberally over the ear. Select the desired number and set it on the forceps with the figure and then check their placement on a paper or on a leaf to ascertain the correctness. Vegetable pigment is first applied on the cleaned surface of ear.

The forceps is introduced from the lower border of the ear and the jaw with the nails in the front and the other jaw with the pad behind the ear.

Pressing the jaw of the forceps makes the firm imprints of marks and then it is removed. Now apply more quantity of the ink and rub well. If there is any bleeding it can be stopped either by pressing with fingers or by adding little more quantity of ink to the bleeding part. Unsatisfactory results are obtained by using dirty instrument, dirty and greasy skin, poor quality and inadequate application of the ink and misapplication of forceps. This will result in improper marks.

TAGS

The number tags are generally made up of plastic or metal like Aluminium or Bronze. Easily visible tags are now days used for sheep, goat's etc. The tags are fixed to the flexible part of the ear. There are 2 types of tags. They are 1. Self-piercing- The sharp ends of the tag is directly pierced to ear by the forceps. 2.Non-piercing- A hole has to be punched on the upper edge of the ear, close to the head and one end of the tag is placed through the hole and kept in locked position.

Most of the tags available in the market are pre numbered. Different colored tags are available and are used for distinguishing different sexes. (Sire or Dam)

Precautions while applying the tags:

1. Hole should be made far enough from the edge of the ear and the numbered side should be on the top of the ear.
2. Some antiseptic medicines have to be applied on the punctured area to prevent the infection.

Identification of Poultry

1.Wing band

Wing band is made up of aluminum with the numbers embossed on the plates. At one end it has a piercing point while at the other end there is a small opening through which the tip is passed and folded with out any projections. It is applied on the dorsal border of the wing. It is preferred in the case of young chick / broiler.

2.Leg band

It is made up of aluminium, with embossed numbers on one end with two small projections. At the other end there are four holes. The leg band is applied on the shank region. The projected part of one end is made to pass though the hole of the other end and bent to form a smooth surface in a circular form. Leg band is mostly applied in the case of breeder stock, layer and cock.

Handling is defined as controlling the animals for a brief period especially during artificial insemination, Restraining of the animal is defined as controlling the animal for a longer duration especially like operations etc.

COMMON APPLIANCES THAT ARE USED IN CONTROLLING ANIMALS:

1. **ANTI COW KICKER/MILK MAN'S ROPE:**

This comprises 2 metal plates that are connected by a chain. These are like lips which can be positioned on the tendo- achilles (region just above hock). The matallic plate on the left side is provided with another small lip into which the tail can be fixed so that movement of the tail can be restricted.

ADVANTAGES.

1. It prevents the milk man from being kicked.2.In the case of milk man's rope, it is a cotton rope with a length of 1 m that is used to tie the hind legs of a cow when it is being milked or examined for any diseases in the hind quarters. This is applied by passing the rope around the hind legs above the hock and then crossing the rope between legs and finally making a quick release knot with the free ends of the rope.

2.BULL NOSE RING:

1. It is fixed in the nasal septum of bull. 2. It is made up of aluminum, copper or alloy.

It is made up of 2 semi-circular pieces hinged together. The free ends of the two parts are fixed uniformly without any projections. It is fixed with the help of a screw with a sunken head.

3.BULL LEADER:

It is made up of bamboo stick with a length of 1.5 cm which has a hook at one end with a locking plate. The locking plate can be released with the help of the rope, which is attached to the bamboo stick at the end of the hole. Just by pulling the string the locking plate can be tightened or released alternatively.

4.NOSE STRING: It is used for bullocks when they are put to work. Rope should be of cotton fibres and reasonable size in thickness. The rope is passed through the nasal septum of the animals and tied behind.

5.HALTER: It can be made up of either leather or cotton rope. It comprises of 3 parts, tail and with a central Pouch.

6.MUZZLE: It is made up of rope or bamboo splints or leather strap. These are used to envelop the mouth of the animal to prevent them from biting, self sucking, etc.

9. TREVIS: It is made up of strong hardered or seasoned wood or it may also be made up of metal tubing. The dimensions of a trevis is as follows: length 1.6m, width 0.8m, height 1.5m.The cross bars are provided 3 on the front, one at the rear and 2 at sides. The front cross bars are fixed 0.5, 0.75 and 1m height, rear cross bars is fixed at 0.75m and side is fixed by 0.5 and 1m height. The sides are permanently fixed but the other two are movable. The animal is allowed to enter it from rear end while the front are in closed position. When the animal is taken out the front cross bars are released.

CASTING OF ANIMALS: Casting means throwing animals on the ground. This is done if the animals are to be controlled for long such as performing operations, dehorning, shoeing, branding etc.

PREPARATIONS FOR CASTING:

1. A well grown grass field or sandy area or a bedding made up of paddy straw or saw dust are ideal surfaces on which large animals can be cast.
2. There should be plenty of room around with no stones, bricks, wooden pieces etc. on the ground and no objects near by against which the animal may dash itself.
3. For casting cattle and buffaloes a circular area of about 8m diameter will be sufficient

COMFORT OF THE ANIMAL:

1.Acceptability of the site depends upon the availability of the condition in the farm.

2.Fast the animals at least 12 hours before casting. This is done so as to avoid the danger of injury to distended digestive tract. The animals are casted usually on the right side so as to prevent damage to the digestive tract. In case of emergency, it can be casted on the other side with precautions. For many vicious animals which cannot be roped sedative agents are used to calm down the animal. There are two methods for casting of the animal.

The common and effective method is **American method**. With a casting rope of 8m long, a running noose is applied at the base of the horn and in the case of horn less animals it can be fixed at the neck region, then a series of three hitches can be fixed at the neck halter or abdominal region. Usually the hitch at the neck is avoided. The free end of the casting rope is taken around the thigh region and it is pulled and at the same time a man is allowed to hold the neck and turn towards the opposite side. Two men should pull the loose rope backward. The animal will touch and sink to the ground. After throwing the animal to the ground the man holding the neck should keep it thrust against the shoulder region. Another should introduce the tail in between the thighs and pull it tight. The 2nd should secure with another rope the legs. Same operations should be carried in reverse order for releasing the animal.

INDIAN METHOD: In this method the rope is fixed on the abdominal region and the other end of the rope is passed around the hollow of the pastern on the hind limb. A knot at the fore leg can be put to keep the animal under control. A man at the head end should turn the head in the opposite side to which the animal is to fall. Now the rope end that is free is used for securing the animal and at the same time while pulling the free end of the rope a man should secure the hind portion to avoid sudden falling of animal. This method is usually followed in the case of lightweight animals.

Ex No:4

Date: **DISBUDDING,CASTRATION AND DENTITION**

Dehorning

Removal of horn either partially or completely. Dehorning is done in adult animals because of the following reasons 1) Fracture. (injury) 2.Horn Cancer.

Saw Method

Cornual block anaesthesia is administered to the animal in order to control and to avoid pain. With the help of ordinary saw the damaged portion is cut just above the fracture area. There will be profuse bleeding because of severing of major blood vessels. After surgery antibiotic powder is sprinkled or stuffed in the area and bandaged. Care is taken that the wound is cleaned regularly as otherwise it would predispose for maggots.

Elastrator Method

When there is no urgency for the operation this technique is being adopted. The horny portion of the horn is chiseled to a width of 1-2 cms. In the chiseled area a rubber band with high tensile strength is applied with the help of an elastrator. After the application, the rubber band will try to contract and it will slowly start cutting the soft core of the horn. Since the progress of the process is a slow one, the occlusion of blood vessels takes place simultaneously. This method is safer than the saw method because the blood loss is minimum or negligible. In this case the animal will have pain for a longer duration.

Disbudding

In this method the growth of horn is arrested at an early age of the animal. It is preferably done within 4 to10 days after birth.

Advantages

1.Horns serve no purpose in the case of dairy animals.2) During fighting does not cause major injury.3) Less space for housing is sufficient. 4) Provides uniformity among the animals.5) Dehorned animals are handled easily and are not dangerous to operators.

Disadvantages

1) Animals with a nice horn have a characteristic style, 2) Animals with horn can defend themselves 3) This is advantageous in exhibition and cattle show. 4) In some breeds horns are important marks of identification.

Methods of Disbudding

1.Chemical Method. 2.Hot Iron 3.Electrical dehorner.

Chemical method

Caustic Potash/ Sodium or Potassium hydroxide Pellets or Sticks are used. i.Clip the hair around the horn bud. ii. Apply Vaseline or Petroleum Jelly around the horn bud to avoid damage to the adjacent soft tissue .iii. Catch hold of the pellet with the help of a forceps and start rubbing against the horn bud in a circular fashion. iv. The process is continued till blood starts oozing out of the central bud. v. Bleeding is arrested by thermo- cautery. vi. Apply tincture iodine over the area and bandage.

Hot iron Method

In this method the end of the dehorner is made red hot and applied over the horn bud in order to destroy the tissue. The sharp end of the rod is made to penetrate the outer circumference of the horn bud and lifted. Since the rod is red hot the bleeding gets automatically arrested. Application of bandage is not mandatory.

Electrical Dehorner

The principle is the same as that of the hot iron dehorner, but the difference is that the temperature at the end of rod is maintained at 1000^{o} C. The tip of the rod made of Copper is circular and just by pressing the rod against the horn bud for 10 seconds and by gentle lifting, the horn bud is removed. The rod is heated by electricity.

CASTRATION : It is the removal of testicles-the gland that produces the male germ cells.

Purpose.

i. Surplus bulls which are unfit /not required for breeding purpose are castrated.

ii. To make animal docile and fit for work purpose. iii. It results in finesse of neck and ease for fitting the yoke. iv. in case of pigs, goat and sheep it is done to improve weight gain and improve quality of meat v. Indiscriminate breeding is prevented.

Age for castration. Cattle: 1 year. Kid and lamb -4-6 months. Piglets-1-2 weeks.

Methods of castration. .

1. **The open method** is followed incase of horses, pigs and dogs. The area is first sterilized and local anaesthetic is given. With a sharp knife a slit is made on the skin and the spermatic cord is identified. Then two crushing one below the other are made at distance of 2 cms and in between, the cord is ligated and the portion towards testes is removed by severing at the second crush point. Antibiotic powder is dusted and the skin is sutured. Tincture iodine is applied to prevent infection.

2. Closed Method. ***BURDIZZO CASTRATOR*** is the instrument used for the castration. i. It is bloodless operation .ii. Destroys the spermatic cord by crushing. iii. the nourishment to the testicles is discontinued and atrophy of the testicles takes place.

The animal is casted. The testicles are dragged against the scrotal wall. The jaws of the castrator are introduced through the lateral border of the scrotum. Then the handle is pressed; the instrument is so fabricated that by pressing the handle maximum pressure is applied at the jaw end. The crushing is done 3-5 cm above the dorsal end of the scrotum. Two crushings are made at intervals of 2.5 cms. The second crushing is made just below first crushing to avoid pain. Apply tincture iodine to the crushed area. Initially swelling of the testicles are noticed followed by atrophy.

Precautions. i. Take care to see that the cord does not slip during cutting. ii. The castrator should not press any fold of skin. iii. The castrator is not placed too low to crush the testicles itself. iv. To ensure successful operation it is advisable to crush the cord at two places. v. Two crush marks from the opposite sides should not be aligned. vi.Neem oil is applied on successive days to avoid infection.

Advantages. Bloodless operation. Amount of pain evinced is minimum. No treatment is essential. No abscess formation at the site of crushing.

Ageing of Animals

Aim : To study the age of animals.

Purpose :i. Asses the productive period of animals.
ii. To fix the price of animals from the point of either buyer or seller.

Methods : 1. Dentition 2. Cornual rings 3. Records.

Dentition : Depending upon the position and function, teeth are classified as i. Incisors. ii. Canine iii. Pre molars iv. Molars. Incisors are for the purpose of offence or defense while the premolars and molars are for the mastication.

Incisors are named after its position i. Central / Medial ii. 1st Lateral iii. 2nd Lateral iv. Corner.

There are two types of teeth (Viz.) 1. Temporary 2. Permanent. The Temporary ones are also called as milk teeth. They are smaller , narrow in size and white in nature. The permanent teeth are broader and yellow tinged. Each pair of teeth arises approximately at a particular age of the animal. The eruption of teeth varies with the breed, nutritional status of the animals and feeding habits of the animal.

Dental formula: It is a conventional way of giving a number for each type of teeth that are present on one side of the mouth. It is represented as 1 : Incisors 2. : Canine 3. Premolars. 4. Molars. The number in the numerator denotes the number of teeth in the upper jaw and the number in the denominator denotes the number of teeth in the lower jaw.

Cattle, Sheep and Goat : **Temporary**. I :O/ 4; C : O/O : PM : 3 /3: M 0/0; 10 x 2 = 20 no.

Permanent. I :O/ 4; C : O/O : PM : 3 /3: M 3/3; 16 x 2 = 32 no.

Since the incisors are easily examined the attention is commonly paid to the stage of development of incisors.

Type of teeth	Indigenous	Exotic	Sheep	Goat	Pig
Central Incisors	2 ½ years	2 years	1 ½ years	1 ¼ years	1 year
1st lateral	3 ½ years	3 years	2 years	3 years	**Canine-9 months**
2nd lateral	4 ½ years	4 years	2 ½ years	4 years	Lateral- 1 ½ years
Corner	5 ½ years	5 years	3 years	5 years	**6 MONTHS**

Pig : Temporary. I : 3/ 3; C : 1/1 : PM : 3 /3: M 0/0; 14 x 2 = 28 no.
Permanent. I : 3/ 3; C : 1/1 : **PM : 4 /4**: M 3/3; 22 x 2 = 44 no.

The age of animals is found out by counting the number of rings in the horn called "Cornual Rings". No. of rings plus one will give the age of the animal.

Ex.No.5 **STUDY AND JUDGING OF TYPE DESIGN OF LIVESTOCK AND**
Date: **POULTRY HOUSES**

		Head to Head System	Tail to Tail system	Milking Parlour	Loose Box	Calf Shed
Orientation						
Type						
Roofing material						
Flooring						
Manger	Depth					
	Width					
	Length					
Front kerb	Width					
	Height					
Rear kerb	Height					
	Width					
Drainage channel:	Width					
	Depth					
	Gradient					
Standing Space	Length					
	Width					
	Area					
Feed. pass	Width					
Cent. alley	Width					
Shed	Height at eaves					
	Height at ridge					
Pillar	Height					
Loose box-Pen	Length					
	Width					
	Area					
Loose box-Run	Length					
	Width					
	Area					
Calf shed-Pen	Length					
	Width					
	Height					
	Area					
Calf shed-Run	Length					
	Width					
	Height					
	Area					
Remarks						

			Cage system of housing	Deep litter system
Orientation				
Type				
Roof	Type			
	Material			
Flooring				
Cage		Type		
		No. of Tiers		
		Width		
		Length		
		Height		
Dimension of shed		Length		
		Width		
Floor space / bird				
Height of cage from ground				
Length of water channel / waterer				
Length of feed channel or feeder				
Cent. alley	Width			
Shed	Height at eaves			
	Height at ridge			
Pillar	Height			
Height of litter material				
Type of litter material				
Ventilation				
Length of overhang				
Provision of foot bath				
Remarks				

Ex.No: 6 SELECTION OF DAIRY CATTLE AND WORK BULLOCK

Date:

It is defined as the building block of animal breeding. Animal breeding is in turn defined as foundation stone of maintenance of animal with respect to production and reproduction.

Qualities of breeder

Breeder should identify the best animal among a herd of animals. For this, he should posses a strong basic knowledge regarding the breed characteristics of particular animal.

1. Breeder should know the description of animal.
2. Should make quick decisions and it must be accurate.
3. Individual should consider the desirable and undesirable characters of the animal before he makes a final decision.
4. Should posses good stockmanship and inner feeling of maintenance of the animals.

Types of selection

1. Natural selection

Animals withstanding the natural condition or climate. Survival of fittest or selection of fittest.

2. Artificial selection

Man made selection:

(i) Selection based on records

This is possible only in organized dairy farm or in private dairies where the complete details regarding production performance of animals are maintained.

(ii) Selection based on pedigree - genotype selection

Pedigree selection is mainly based on heritability factor ranging from 0-0.9. e.g. milk production 0.2 -0.3. ; Fat percentage 0.4 - 0.5. Primary importance is given for heritability of characters, which have got high values.

(iii) Selection by means of general appearance: (Phenotypic selection)

It is done based upon the scorecard. It is different for dairy cattle and bullock.

Sl.No.	CHARACTERS	Marks
1.	General appearance	30
2.	Dairy conformation	20
3.	Body capacity	20
4.	Mammary systems	30
Total		100

Dairy Cattle

General appearance

1. Animal should be attractive.
2. It should possess feminine look and vigor.
3. Different parts of body blends harmoniously.

Head

Clean cut, proportionate to body.

Muzzle

It is moist in cattle. Should be broad with large nostrils.
Jaws - Should be strong and perfect
Eyes - Large and bright
Forehead - Variable; Nasal bridge - Straight except in Jersey where it is disc shaped
Ears - medium size and alert, varies with breed.
Shoulder blades - Set smoothly and tightly against body.
Back - Strong and straight.
Loin - broad and nearly flat or leveled.
Rump or croup - Long and wide.
Tail head - It should be set in line with back and there is lack of coarseness.
Tail - Long and slender.
Legs - Bone is flat and strong. Pastern should be short and long.
Hock - Clean and moulded.
Feet - Short, compact, well rounded off with deep heel and elevated sole.
Foreleg - Medium and straight, wide apart, squarely placed.
Hind leg -Perpendicular from hock to pastern from the side view and straight from rear view.

Demerits: Total blindness, cross-eyes, wry face, face should not be twisted on one side. Parrot Jaw - maxilla is greater than mandible, winged shoulders, capped knee, wry tail. short tail.
Legs and feet: Lameness can be apparent, unfit if it is permanent and interfacing.

Prominence of arthritis

Inflammation of Joints. Disproportionate size, uneven gait, Sway back, depression in back and loin region.

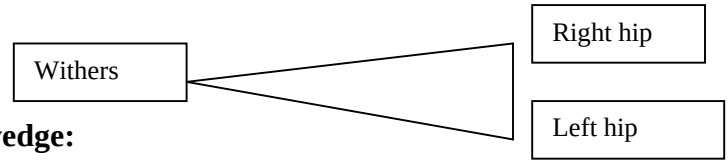
DAIRY CONFORMATION

The angularity of animals gives a true picture about dairy conformation of animals. Dairy conformation is usually represented in terms of triple wedge .

a. Dorsal wedge; b.Lateral wedge ; c.Front wedge

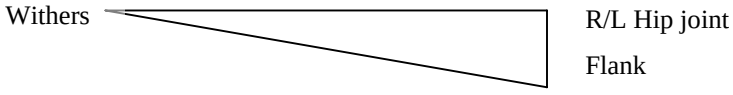
a. Dorsal wedge:

Joining imaginary lines from withers to the point of hip on either side and a line joining the two points constitutes it. The dorsal wedge line indicates the accommodation of reproductive tract of animals.



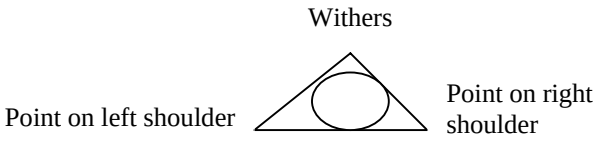
b. Lateral wedge:

It is constituted by drawing an imaginary line from withers to point of hip and withers to the flap of flank and an imaginary line from flank and hip which indicates capacity of digestive tract.



c. Front wedge:

Imaginary line from point of shoulders on either side to withers and a line joining the point of shoulders. It gives an indication about the respiratory tract.



Body capacity

Proper length, width and depth. Ribs should be well arched.
Barrel should possess rounded appearance
Lack of depth, width, length, straight ribs are undesirable.

Muzzle and mouth-strong, large enough give indication about the animals consumption of coarse dry fodder and green fodder.

Undesirable Characters: Small, narrow mouth, worn out or broken mouth.

Mammary System: Breeder should have good vocabulary for describing desirable character and deviations regarding mammary system of animals.

1. Wide, strong attachment. Fore quarters - extended well forward.
2. Udder should posses an excellent width of rear view. Udder should be pliable, soft and spongy and collapse completely after milking.
3. Teats should be uniform in size and squarely spaced.
4. Prominently branched milk vein should be seen on the udder as well as on the body barrel.

Undesirable

Weak attachment, pendulous where depth is greater than length. . Shallow fore quarters.

Hind Quarters are not well carried away behind body. Lack of width of rear quarters and hardness/ firmness of udder indicate lack of secreting tissues. Tilted udder and variable size of teats. Teats are not squarely placed presence of 'warts' in the udder, small and unbranched milk veins.

Score card for Judging of Dairy Cattle

Character	Marks allotted	Animal Number		Animal Number		Animal Number		Animal Number	
		Breed	D.O.B/ Age & No.	Breed	D.O.B/ Age & No.	Breed	D.O.B./ Age & No.	Breed	D.O.B./ Age & No.
1.General appearance	**30**								
a) Head	5								
b) Neck	5								
c) Hip	5								
d)Tail	5								
e)Leg	5								
f)Feet	5								
Total	**30**								
Remarks									
2. Dairy conformation	**20**								
a) Neck	5								
b) Ribs	5								
c) Flank	5								
d) Thigh	5								
Total	**20**								
Remarks									
3.Body capacity	**20**								
a) Barrel	10								
b)Heart Girth	10								
Total	**20**								
Remarks									
4.Mammary System	**30**								
a)Udder parameters	25								
b) Milk vein	5								
Total	**30**								
Remarks									

SELECTION OF WORK BULLOCK

Breed: **Age:** **Tattoo No.:**

S.No.	CHARACTERISTICS	MARKS	REMARKS
1	**GENERAL APPEARANCE**	**20**	
	Height of the hump and size	08	
	Form : Deep and symmetrical	04	
	Quality :Bones and joints clearly formed	04	
	Carriage and Disposition	04	
2	**HEAD AND NECK**	**12**	
	Head : Well shaped and true to breed	02	
	Ears : Long and capable of flapping the eye	01	
	Eyes : Large, prominent & expressive	02	
	Muzzle : Large mouth wide ; nostril wide	02	
	Horns : shaped true to breed	01	
	Neck : Long & strong with good dewlap	04	
3	**FORE QUARTERS**	**20**	
	Shoulders : Deep, sloping and sturdy	03	
	Hump : Well developed	02	
	Fore legs : Well muscled, set square	05	
	Knees : Straight and broad	01	
	Cannons : Bone ample sized and broad	02	
	Fetlock : Straight and broad	01	
	Pastern : Moderately long	02	
	Feet : Black & waxy with narrow cleft	04	
4	**BODY**	**12**	
	Back : Strong & straight	04	
	Loins : Short, broad & strong	04	
	Chest : Deep & broad with well sprung ribs	04	
5	**HIND QUARTERS**	**26**	
	Hip : Broad	01	
	Rump : Well muscled	03	
	Tail : Thin, well set, long and tapering	02	
	Thighs : Deep, wide and full	03	
	Hocks : Fairly wide apart	02	
	Cannon : Broad, short, flat and clean	03	
	Fetlock : Well formed	03	
	Pastern : Well formed	01	
	Feet : Large with narrow clefts	02	
	Hind legs : Set square	03	
	Buttocks : Well rounded and broad	03	
6	**ACTION**	**10**	
	Walk : Free and regular with easy gait	06	
	Trot : Energetic and rapid	04	

Ex No.7 DETERMINATION OF SPECIFIC GRAVITY, FAT %,
Date: TOTAL SOLIDS AND SOLIDS NOT FAT

Specific gravity

It is defined as the ratio of heaviness of milk to water. Specific gravity of milk depends upon the proportion and the amount of total solids present in the milk. Specific gravity of milk is influenced by temperature.

Liquids are greatly influenced by temperature in terms of their specific gravity. So a constant temperature of 60^0 F is taken as reference index. Liquids expand on heating and specific gravity will decrease. On cooling liquids condense and specific gravity increases.

Methods for determination of specific gravity

1. Westphal's balance method

Pycnometer or specific gravity bottle method.

2. Quevenne lactometer method

Lactometer

Lactometer is a specialised type of hydrometer, which is used to find out the specific gravity of milk.

It consists of three parts. 1.Stem. 2.Body and 3.Bulb

Inner surface of the bulb is coated with mercury to facilitate the Lactometer to float erectly. In the stem region there is a scale graduated from 0-40. In the 32^{nd} division a red mark is indicated which is usually referred as permissible level.

Precautions

1. Milk that is subjected to analysis should have lapsed 2 hours after milking. This is because the freshly drawn milk contains dissolved gases, which will affect specific gravity.
2. Milk is transferred to a tall jar through the sides to avoid incorporation of air.
3. Lactometer should be clean and dry.
4. Lactometer should not touch the sides of the tall jar.
5. Temperature of the milk should be between 50^o - 70^oF. If the temperature is higher or lower than the standard temperature **CORRECTION** is to be made. For every 1^o F more than the standard temperature add 0.1 to the Lactometer reading and for 1^0 F less than the standard temperature subtract 0.1 to the Lactometer reading.
6. Allow the Lactometer to float in the sample of milk and observe. The Lactometer reading of milk is equivalent to CLR/1000 + 1 where CLR represents corrected Lactometer reading.

Sample 1.

Temperature of milk	- 65^o
Lactometer reading	- 10
Corrected Lactometer reading	- 10.5
Specific gravity of milk	- 10.5/1000 + 1
	- 1.0105

Specific gravity is less than normal . So it is adulterated milk and it is unfit for consumption.

Sample 2.

Temperature of milk	-	50^o
Lactometer reading	-	28
Corrected Lactometer reading	-	27
Specific gravity of milk	-	27 /1000 + 1
	-	1.027 + 1 = 1.027.

Specific gravity of this milk is within the normal range, so it may be normal However it is subjected to analysis of Butter fat, Total solids and Solids Not Fat. This milk may be partially skimmed or there may be removal of fat from this milk.

Determination of fat content of milk

Purpose

1. The food value of milk is mainly dependent upon the fat percentage of milk.
2. To assess whether the milk is adulterated or partial skimming is done.
3. It is useful to estimate fat for the manufacture of products like butter, ghee, cheese, cream etc.

Methods to determine fat content

1. Gerber's method - oldest and perfect method.
2. Electronic milco tester method.

Gerber's Method
Materials Required

1. **Butyrometer**. It consists of three parts a) Neck b) Body and c) Stem. In stem there are graduations from 0-10% to read the fat percentage directly.

There is also special type of butyrometer called skim milk butyrometer to read the fat percentage of skimmed milk. It also consists of neck, stem and body. But the scale is from 0-0.5% and the body capacity is 25 ml.

The third type of butyrometer is known as Neobutyrometer which is used to estimate the fat percentage of cream. The scale ranges of 15-60%.

2. 11ml Pipette 3. 10-ml automatic pipette to dispense 85% sulphuric acid.
4. 1 ml automatic pipette which is used to dispense amyl alcohol.

Chemicals required

1. 85% sulphuric acid - specific gravity of 1.85 - 1.87
2. Amyl alcohol - Specific gravity of 0.85 - 0.9.

Principle

1. Sulphuric acid is able to dissolve all the ingredients of total solid and liquid fat.
2. Since the specific gravity of sulphuric acid is higher, it facilitates easy separation of milk serum from fat.
3. During the process of liquefaction, enormous quantity of heat is being generated which facilitates separation of fat very easily from milk serum.
4. Since an enormous quantity of heat is being generated, to prevent charring of fat amyl alcohol is being added.

Procedure

1. Transfer 10 ml of freshly prepared sulphuric acid into the butyrometer.
2. Transfer 11 ml of milk through the sides of the butyrometer so that after addition of milk, two distinct layers are noticed.
3. Transfer 1 ml of amyl alcohol
4. Close the butyrometer with the help of a rubber knob which consists of metallic part and rubber part. In the metallic part, there is a knob to elongate the rubber part.
5. Start tilting and dissolve completely the casein particles present.
6. Centrifuge the butyrometer at optimum speed for 5 - 7 minutes centrifugation is done for easy separation of fat from milk serum.

Observation

After centrifugation, a clear straw colored fluid is noticed in the stem region. The lower meniscus of the upper and lower layer is made to coincide with the readings and the difference gives the fat percentage.

Inference:

Depending upon the type of sample inference is drawn. If the given sample is cow's milk, fat percentage is 3.5% In case of single toned milk it is 3% and in double toned milk it is 1.5% In case of buffalo's milk it is 4%.

Advantages

1. It is simple and has got a high degree of accuracy.2.It does not require any skill.

Disadvantages

1. Corrosive chemical is involved 2. The quantity of milk sample that is required for analysis is high. 3. Cost of chemical per analysis is high. 4. It is a time consuming process

Trouble shooting:

Causes for curdy fat column

1. Insufficient or weak acid. 2. Incomplete mixing of acid.

Causes for dark fat column

1. Too much or too strong acid. 2.Temperature of milk is high. 3.Uneven mixing of acid and milk. 4. Too long time interval between mixing and centrifugation.

Causes for Low Result in Testing Milk

1. Improper sampling. 2.Presence of water in the sampling bottle.3.Improper and insufficient time in the centrifugation.4.Partially skimming of milk

Causes for too high result

1. Improper sampling.2.Improper measuring of quantity of milk.3.Partial churning and sampling of milk. 4. Presence of charred particles in the milk.

Electronic Milco tester method

Principles

1. Electronic milco tester is based on photoelectric (metric) method of measurement of light scattered by the milk sample. The light scattered by the fat globules is taken into account for estimating the fat content of milk. Each fat globule acts as a prism and scatters the light.
2. Not only the fat globules in the milk contribute to the light scattering but also the protein may affect the measurement. To eliminate this influence it is necessary to dissolve them. EDTA solution is used for this purpose. It is usually represented as diluent.

Composition of diluent

To prepare 10 liters of the diluent the following chemicals are required.

1. EDTA - 45g. 2.Disodium hydroxide - 7.6 g. 3. Triton x 100 - 0.5 ml - It is an emulsifier. 4.Anti-foaming agent - 0.5 ml. Commonly used one is Dekalin / Octanol.

All the fat globules are not of uniform size. So there may be variation in the scattering of light. To have more or less uniform size fat globules, the mixture is allowed to pass through the homogenizer and we get uniform size fat globules ranging from 0.5 - 1.5 micron.

Advantages

1.120 - 150 samples can be analyzed in an hour.
2.Accuracy of the result depends upon the fat percentage.
below 5 - 0.06 %: Above 5 and below 8 - 0.1% ; Above 8 and below 13 - 0.2%
3.Sample of milk required is very minimum.4.Diluents are not corrosive in nature
4.Does not require any special skill.

Disadvantages

1. Cost of equipment is high.2.Power supply is essential

Procedure

A sample of milk is mixed properly without incorporation of air and the sample is placed at the milk inlet knob .Then press the milk inlet knob. 0.5 ml of sample is taken in automatically. Then milk outlet is pressed along with milk. 6.5 ml. of diluent will come out and the same is received in a cuvette. The cuvette is shifted to the analyzer inlet, then the handle is raised and lowered three times. Within few seconds the fat % is displayed.

Determination of Total Solids and SNF Content in the Milk

Total solids in the milk can be determined by three methods.

1. Evaporation Method
2. Richmond's formula
3. Richmond's scale

Evaporation method

Take the empty weight of the crucible (W_1.g)
Take the weight of crucible with milk (W_2.g)
Heat and evaporate the milk till all the moisture content is lost. See that the charring of milk does not take place.
Cool it in a dessicator and take the weight (W_3 g)
Weight of the milk = W_2 - W_1 g , weight of the total solids is =W_3 - W_1 g.

Percentage of total solids

$$= \frac{W_3 - W_1}{W_2 - W_1} \times 100$$

Richmond's formula

$$\textbf{Total solids} = \frac{L}{4} + \frac{6F}{5} + 0.14 \quad \text{where}$$

L - Corrected Lactometer reading
F - Fat percentage of milk

For Example :Temperature of the milk is 64^o F. Lactometer reading is 28. Fat percentage of milk is 5% Calculate the total solids.

Corrected Lactometer Reading

L = 28 + 0.4
L = 28.4

Fat percentage(F) = 5

$$= \frac{28.4}{4} + \frac{6(5)}{5} + 0.14 = 7.1 + 6 + 0.14 = 13.24\% .$$

SNF = 13.24 - 5 = 8.24%

Protein Content of milk =1.9+0.4 F; 1.9+0.4x5.0=1.9+2.0=3.9
Fat Corrected Milk (4.0 %) = 0.4 + 0. 15 x Fat %; 0.4 + 0.15x5.0=0.4+0.75=1.15: (i.e.) 1 litre of 5.0 % fat milk is equivalent to 1.15 litre of Fat Corrected Milk.

Ex.No:8 **DEMONSTRATION OF CREAM SEPARATION,**
Date: **BUTTER AND GHEE MAKING**

Cream is defined as the portion of milk rich in milk fat which has risen to the surface of the milk on standing or separated by CENTRIFUGAL FORCE.

Cream rising to surface is as little as 10% due to gravitational force; while with the assistance of factory modern cream separator separation of cream is possible to a very high FAT %. Therefore the skim milk will contain very negligible amount of fat - to the tune of 0.1 to 0.3 % only.

Purpose

To get a product from which butter is obtained for table purpose and for preparations like soup, ice cream etc.

Varieties of cream: % FAT: Thin cream : 29.5% Medium: 36.0% Thick : 60%,
Plastic cream - 80%.

Methods of Preparation

Gravity creaming: Shallow pan method 4" depth /24 -36h / 0.5-1.39% skim Milk
Deep setting method 20"depth / 8-15" dia / 50° F. skim milk 0.2-0.4%

Water Dilution : Equal Volume H_2O 12 hrs ⟶ f at loss - ⟶ 0.4 %

CENTRIFUGAL CREAMING

Principle

As the milk enters the rapidly revolving bowl of the separator, it is acted upon both by the gravity and by the Centrifugal force generated by rotation.

The centrifugal force being much greater than that of G, milk on entering the bowl is thrown into the outer wall of the bowl and fills it from outside towards centre.

The milk serum has got higher specific gravity (1.036) than that of the fat (specific gravity 0.9). Milk serum is brought to the outer part of the bowl while the cream is forced towards the centre of the bowl.

Separate outlets are provided for the cream and skim milk.

Cal. : Quantity of milk : 3 kg with 4% Fat : Cream obtain 200g: Cal. Fat% in the cream

100g - 4: 3000 g 3000 200 g 120 g. f. 60% $\frac{120 \times 100}{200}$

4 x 3000/100 ------ = 120

Parts Of Cream Separator

1. Mechanical Part : Gear, Central Spindle.
2. Separator Part :

Bowl Body, Rubber Ring (Gasket), Distributor. Bottom Disc ; Intermediate Disc; Top Disc: Bowl Hood, Bowl Nut, Milk Receptacle - Float - Reservoir - Key, Skim Milk Outlet ; Cream Outlet.

Advantages Of Centrifugal Cream Separation.

Fat Separation is very efficient (S.M=0.024% Fat)

By Regulating the Cream Screw - Cream Containing Differing. % Of Fat May Be Obtained.

Considerable Saving Of Time & Labour

Cream has a low Lactic Acid Content

Skim Milk is in Fresh Condition - can be used for preparation of Beverages, Curd, Skim Milk Powder etc.

Milk For Separation can be separated at 90-100^{o} F

Parts Of Butter Making Equipment

Butter Churn ; Butter Worker ; Butter Scoop ; Butter Scotch, Filter.

Churning

i. Preparation of Churn : Wooden churner, Submerge Over Night. Sterilize with hot water
ii. Filling up of Churn: 1/3 Of The Capacity with Cream.
iii. Operation of Churn: Rotation 45 rpm. Removal of Gas.
iv. Washing :
v. Salting & Working :

PREPARATION OF BUTTER

Butter may be defined as a fat concentrate which is obtained by churning of cream, gathering the fat into a compact mass and then working on it.

Butter must contain not less than 80% by weight of milk fat, 1.5% by weight of curd, not more than 2.5% of common salt & moisture 16%

METHODS : Country and Creamery methods

COUNTRY : MILK → BOILING → COOL → STARTER → CURD → CHURNING BUTTER

DESI : SMALL QUANTITY - CAN BE DONE

CREAMERY METHOD

STANDARDIZATION (35-40% FAT)

↓

PASTEURIZATION (82-88^0 C - No Holding Time)

↓

COOLING (20-22^0 C)

↓

RIPENING (20-22^0 C) STARTER — 2-2.5% - WINTER -12-15Hrs; 1% - SUMMER - 8 10 Hrs

SOUR UPTO 0.8 - 1.0% LACTIC ACID

↓

AGEING

↓

CHURNING

↓

WASHING

$$Y = \frac{F\ (100 \times \%\ OR)}{100}$$

↓

SALTING AND WORKING

Y : YIELD : F : FAT% in kg

OR: OVER RUN

↓

PACKING & STORAGE

OVERRUN IS DEFINED AS THE INCREASE IN THE AMOUNT OF BUTTER MADE FROM A GIVEN AMOUNT OF FAT.

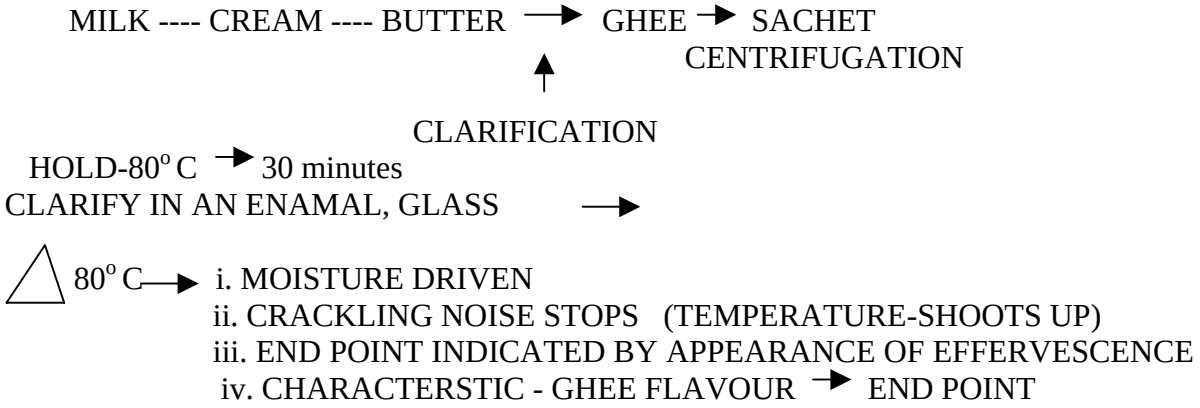
'OR' is a source of profit to the butter maker and also helps to check the efficiency of factory operation.. Maximum PermissibleLevel is 25%

Under Indian conditions : % overrun = 20-22%

$$\%\ OR: \frac{\text{kg of butter obtained - kg of fat in cream}}{\text{kg of fat present in cream}} \times 100$$

Preparation of Ghee

Ghee is defined as clarified butter fat obtained solely from milk of cow or buffalo or from desi butter or creamery butter with Max moisture- 0.3%



Principle

When Ghee is left Undisturbed at a Temperature of 80 - 85° C For 15-30 Minutes it Stratifies (i.e.) Separates into 3 Distinct Layers.

Top Layer : Floating - Denatured Particles of curd

Middle Layer : ' FAT '

Bottom Layer : Butter Milk

The Separation into Layers has been called - Pre Stratification.

Ex.No:9 CLASSIFICATION OF FEED AND IDENTIFICATION OF FEEDS & DATE: FODDER

Classification of Feed

a. Concentrate
   1. Energy Feeds
      a) Grains and seeds (Maize Barley, Sorghum, millets)
      b) Mill by products (Bran, grits etc.)
      c) Roots (tapioca, turnips and potatoes)
   2. Protein supplement
      a) Animal by products (Blood meal, meat meal, offal's from slaughter house)
      b) Marine by products (Fish meal)
      c) Avian by products (feather meal)
      d) Brewer's grain and yeast
      e) Oil cakes

b. Roughages

   1. Succulent
      a) Pasture (Natural and Artitificial)
      b) Green fodder - Legumes (Lucerne, Berseem, Cowpea, Cluster bean, Stylo, Centro, Agathi, Hedge Lucerne etc.)
         Non legumes – (Fodder Maize, Fodder Cholam NB 21, CO3, Guinea grass, Napier grass etc.)
      c) Tree leaves (Jack, Subabul, Mango, Tamarind, Rubber Banyan, Banana stem, Pipal etc.)
      d) Root crops
      e) Silage

   2. Dry
      a) Hay
         i. Legumes – Lucerne
         ii. Non legumes – Cenchrus
      b) Straws (Paddy, wheat, barley)
      c) Stover (Maize and jowar)
      d) Haulms (Groundnut)

c. Mineral supplements (Natural and Pure elements)
   a) Major minerals
   b) Trace minerals

d. Vitamin supplements (Water and fat soluble)

e. Additives (Antibiotics, hormones, coloring agents, liver stimulants, probiotics, enzymes etc.)

Energy Supplement: 1. Grains 2. Mill by products and 3. Roots
Protein supplement: 1. Plant 2. Animal 3. Marine 4. Non Protein nitrogenous substances

Maize	:	Highly Palatable : Inclusion level : 20 - 60% DCP 8.2 : TDN 94% :Deficit - A.A: Lysine, Methionine poor. Rich in carbohydrate
Sorghum	:	Replaces 50% of maize: Inclusion level : 10 -30% DCP 7.3; TDN 85 ; Deficit - Carotene
Minor Millets	:	Ragi: Cumbu: Samai: Varagu. DCP 10-12%; DCP 85% ; Inclusion Level - 10 - 20%
Molasses	:	Readily available high energy : Highly Palatable Good binding agent : Inclusion level - 5 - 10% : Urea: Molasses 1:5
Tapioca	:	Cheap ; DCP 1.3 ; TDN 83 ; Replace maize 25% Urea : Tapioca 1:5
Groundnut oil Cake	:	Protein supplement ; DCP 45 ; TDN 78 ; Inclusion level : 15 - 30% [Poultry - 12-25% Inclusion level]
Sunflower Cake	:	Inclusion level 5-20% : DCP 35-37 : TDN 87% ; Inclusion level-5-20%
Soya bean Cake	:	Rich in Lysine & Methionine : DCP - 41% ; TDN 85; Inclusion level 10-25%
Cotton seed cake	:	Protein 20-25% DCP; 17.5% ; TDN - 79% : Inclusion level - 5-20% Poultry : Nil
Coconut oil cake	:	DCP 21% : TDN - 90% : Poor in Lysine & Cystine Inclusion level 15-20%
Gingelly oil cake	:	DCP 31% : TDN 70 : Medium Source of Tryptophan & Methionine : Poor in Lysine : Inclusion level - 12-25%
Fish Meal	:	Inclusion level - 5-10% Lysine, Methionine, Tryptophan DCP 40%, TDN 37: Inclusion level: 5-10% Ca : 8% P 3.5%
Wheat Bran	:	DCP 10% : TDN - 73% : Bulk - Livestock Ration. Poultry 5-10%;
Rice Bran	:	DCP 8% : TDN - 70% : Cattle - 25% Inclusion level ; poultry - 5-10% Commonly Adulterated with Husk.
Rice Polish	:	DCP 10% TDN - 90% : Inclusion (P) - 10-40% Rich in B complex.
Lucerne meal	:	DCP 15-18% TDN 60% : P&C 5% Inclusion level : phytoestrogen: Good source-carotene.

Urea : Non nitrogenous Protein ingredient, Urea : Molasses 1: 5, Urea : Tapioca 1:5 Compound feed (Adults) 1%; and for Calves above - 6 months

Shell grit : Layer Ration - 4 - 5% Inclusion level : Calcium - 38% : Phosphorous : 0%

Mineral Mix : 1-2.5% Inclusion level: Ca : P: 2:1 : 1.5:1 Ca : 23; P=10%. Calcium, Phosphorous, Minor elements, Copper, Cobalt and Iron. To prevent hair ball - provide salt lick.

Green Grass : Legumes - DCP 3 - 5 : TDN : 20 ; Non leg DCP 1 - 2 ; TDN12-15.

Dry fodder : Paddy straw ; DCP - O : TDN - 45 Cholam stover 1-2 : TDN - 40-45

S.No.	Ingredients	DCP	TDN	M.E	Inclusion Level
1.	COTTON SEED	13.5	63.4	-	10-20
2.	Cumbu	12.5	88.8	2.6	-
3.	Gram	13.5	87.2	2.5	-
4.	Sorghum	7.3	85.3	3.1	10-30
5.	Maize	8.2	94.0	3.0	20-60
6.	Ragi	6.7	78.0	2.8	10-25
7.	Rice Broken	4.1	87.6	3.2	10-35
8.	Soyabean Meal	41.4	85.0	3.1	10-25
9.	Coconut Cake	21.1	90.1	3.2	10-20
10.	Cotton Seed Cake	17.4	79.6	2.9	-
11.	Gingelly Cake	31.1	70.1	3.0	12-25
12.	Ground Nut Cake	46.4	78.9	2.9	12-25
13.	Sunflower Cake	37.2	87.0	2.3	5-20
14.	Distiller Grain	14.2	60.4	-	-
15.	Fish Meal	40.9	37.2	2.5	5-10
16.	Gram Husk	0.02	61.3	-	-
17.	Rice Bran	7.9	70.3	2.8	5-10
18.	Rice Polish	10.3	90.7	3.3	10-40
19.	Tapioca	1.5	83.3	3.0	10-20
20.	Wheat Bran	10.3	72.7	2.7	5-10

Ex. No. 10 **Computation of ration**
Date :

Feeding of Livestock

Nutrition involves various chemical reactions and physiological process which transforms food into body tissue and activities (Milk, Meat, Egg work wool etc.)

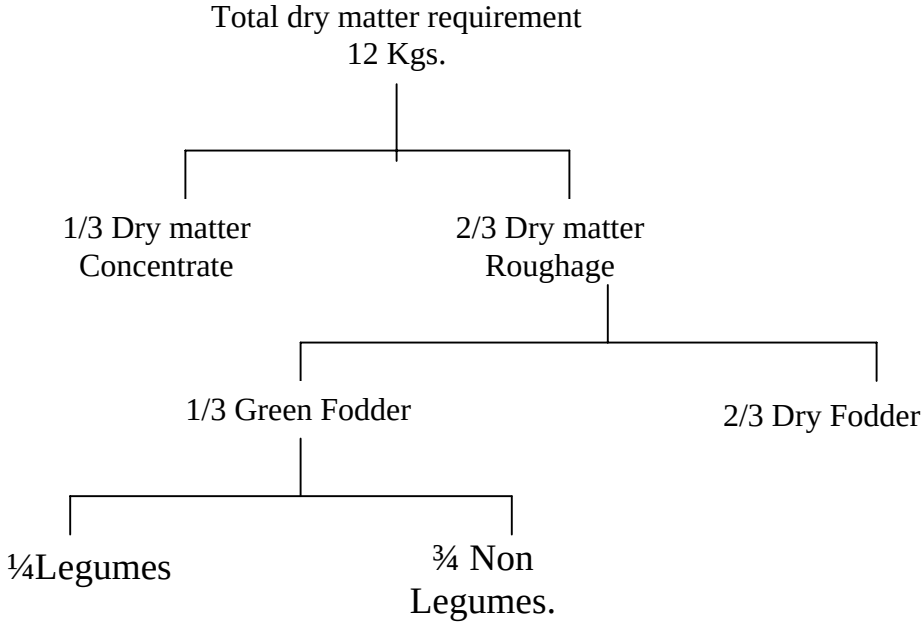
Nutrition involves ingestion, digestion and absorption of the various nutrients and their transport to all the body cells and the removal of unusable element and waste products of metabolism.

Nutrients are defined as the substances that can sustain or aid in the support of t life.
Lavoiser – French. Scientist – Father of Nutrition
There are 2 aspects in animal feeding
1. Science of nutrition
2. Art of feeding of animals (Animal Nutritionist, Good stockmanship)

Ration is the feed allowed for given animal during a day of 24 hours.
Balanced.Ration : Which provides essential nutrients to the animals in such proportion and amount that are required for the proper nourishment of the particular animal.

Sl.No.	Concentrate	Roughage
1.	10% moisture 90% DM	Dry Fodder : 10% - moisture, 90% dry matter, Green fodder 10-20 % dry fodder, 80-90 %Moisture
2.	Highly Digestible	Comparatively less digestible
3.	Crude fiber less than 18%	Crude fibre more than 18%
4.	Nutritive value / unit mass high	Low
5.	Compact in nature	Bulky
6.	Keeping quality : High	Variable : Dry fodder high green fodder : Less or low.

Dry Matter requirement -3% Body weight
Eg. 400 Kg Birth weight
400 x 3/100 = 12 Kgs.



Concentrate Mixtures

Ingredient	CALF				ADULT			
	1	2	3	4	5	6	7	8
Cholam/Maize	45	-	-	10	35	-	15	-
GNC	35	32	35	32	25	25	32	33
Tapioca	-	15	14	15	-	43	20	24
Wheat Bran	10	25	-	25	38	25	30	30
Ragi Flour	-	10	30	-	-	-	-	-
Lucerne Meal	-	10	-	-	-	-	-	-
Molasses	-	6	6	-	-	-	-	-
Fish Meal	8	10	10	10	-	-	-	-
Mineral Mixture	2	2	2	2	1	2	2	2
Salt	-	-	-	-	1	1	1	1

Calf Starter 100kg ; AB_2D_2 20-25 g

Quantity Feed : Calf Starter 1 - 2 months - 125 g ; 2 - 3 months- 625 g

Adult Ration : Milk Production Less than 5 Liters 2.5kg ; 5 - 8 lit. 3.5kg ; 8-10 lit. 4.5 kg ; 10-12lit. 5.5 kg; 12 - 15 lit. 6.5 kg

Pregnant & dry : 3.5 kg ; Heifers - 1 Year - 2 Year - 2.0 kg ; Calves above 3 month below 1 Year 1.0 kg Bullocks ; 2.5 kg; Dry Animals 1.5 kg.

Desirable characters of a ration

Liberal feeding	Satisfy all the physiological status, waste in preparation + feeding **not** over feeding – doubly wasteful
Individual feeding	Avoid competition : adequate-individual
Properly balanced	Concentrate : roughage : Green : Legumes, Non legumes Dry.
Palatable	Smelly: Mouldy, musty, spoiled, inferior and unpalatable – avoid
Variety	Better and balanced mixture of protein, vitamin and other nutrients.
Good and sound	Low quality – unwholesome ingredients may contain toxic components – poor quality – reduce feed value.
Mineral mixture	Every kg milk – 0.7% mineral matter – deficit – depletion –

	metabolic disease Eg.Copper-3g and P- 2.7 g : Egg : 3 g.
Laxative	Otherwise food will be incompletely digested .constipation – digestive disorder – utilization nutrients affected –decreased production
Bulky	Capacious – satiety
Green fodder	Vit A -reproduction – bulky – laxative . cost less - unidentified – easily digestable
Avoid sudden change	Bacterial digestion – prevalence of specified species – sudden change – digestive disorder
Maintain regularity (F)	Glandular secretion – essential for digestion
Properly prepared	Hard grain – coarsely ground : co1seed – soaked Coarse fodder – chaffed – sprinkled salt & molasses – increased consumption.
Labour and cost	Ultimate – aim profit; 70% cost- feed

Ex.No.11 **ECONOMICS OF DAIRY, GOAT AND SWINE FARMING**
DATE :

Economics of Dairy Unit - 20 Cows

Assumption			
1.	No incidence of death or mastitis		
2.	Lactation yield 3000 Lit / Animal		
3.	Service Period - 60 Days		
4.	Inter calving Period - 12 - 14 months		
5.	Green Fodder - Cultivated OWN Land		
I. Fixed Investment			
	Cost of 12 Milch Animal @ Rs.12,000	: 1,44,000.00	
	Cost of 8 Preg: Animal @ Rs.11,000	: 88,000.00	
	Cost of Shed 50' x 50' x Rs.100/- Sq.Ft.	: 2,50,000.00	
	Cost of Chaff Cutter Cost of Utensils	: 18,000.00	
	Total Fixed Investment	**5,00,000.00**	
II. Fixed cost			
	Int. on Fixed Cost: 15%, (5,00,000)	: 75,000.00	
	Insurance on Animals 5%, (2,32,000)	: 11,600.00	
	Misc. Expenses	: 2,400.00	
	Depreciation on (B+E) at 10%, 2,68,000.	: 26,800.00	
	Total Fixed Cost	**1,15,800.00**	
III. Variable Cost			
	Conc. 20 x 5 kg x 300 days x Rs.6/kg	: 1,80,000.00	
	20 x 3.5 x 65 days x Rs.6/ kg	: 27,300	
	Green Fodder 20 x 366 days x 30 kg x 0.30 2p / kg	: 65,700.00	
	Conc. Calves: 10 x 0.5 kg x 60 day x Rs.6 / kg 10 x 1.5 kg x 305 days x Rs.6 / kg	: 29,250.00	
	Green Fodder: 10 x 15 kg x 365 x 0.30 2p	: 16,425	
	Medicine: 100 x 20	: 2,000.00	
	Labour Cost : Rs.1,500 x 3 x 12	: 54,000.00	
	Total Variable Cost	**3,74,675.00**	
	Total Expenditure II + III	**4,90,475.00**	
	By Sale of Milk : 3000 P x 15 x 10.50 / lit	: 4,72,500.00	
	Sale of Dung : 20 x 90 Ton x Rs.300 / ton	: 54,000.00	
	Sale of Gunny Bags: 600 x 8 / bag	: 4,800.00	
	Sale of Dung (Calves) : 10 x 3.0 Ton x Rs.300 / ton	: 9,000.00	
	Total Income	**5,40,300.00**	
	Net Profit: 5,40,300 - 4,90,475	**49,825.00**	
	Profit / Cow: 49,825 ÷ 20	**2,491.25**	
	2491.25 / 3000 lts.= 0.85 np, **+ 10 Calves (5+5) = 75,000/-.**		

Economics of Goat Unit (40 + 2)

Assumption

a)	Green Fodder – Variety + Cultivated -Own Farm		
b)	Concentrates - Own Feed & Mixed as per Composition		
c)	Use of unconventional Fodder Resources (Tree Leaves)		
d)	Kidding - 3 Kiddings / 2 Years @ 2 kids / Kidding		
e)	10 Kids are Allowed for Mortality, Weakling & Single kid		
I. Fixed Cost			
a)	40 Does @Rs.2,700/animal	Rs.1,08,000/-	
b)	2 Bucks @Rs.3,000/- animal	Rs. 6,000/-	
	Total Cost of Animals	**Rs.1,14,000/-**	
c)	Cost of Building		
	42 x 15 Sq.ft / Goat x Rs.50 / Sq.ft	Rs. 31,500/-	
d)	Cost of Chaff Cutter	Rs. 11,500/-	
e)	Other Expenses (Equip)	Rs. 3000/-	
		56,000/-	
II. Recurring Cost			
	Interest of Fixed Cost @ 15%	Rs. 25,500/-	
	Insurance on Animal @ 5%	Rs. 5,700/-	
	Lease Value for 1 Acre Land	Rs. 50,000/-	
	Other Misc. Expenses	Rs, 1,200/-	
	Depreciation 10% (B & E)	Rs. 5,600/-	
	Total Recurring Cost	**Rs. 88,000/-**	
III. Variable Cost			
	Conc:0.2.50 kg x 42 animals x 365 days x Rs.6/kg	Rs. 22,995/-	
	Green Foder 5 kg x 42 x 365 x 30 np / kg	Rs. 22,995/-	
	Conc: Kids 0.1 kg x 110 kids x 300 days x Rs.6/kg	Rs. 19,800/-	
	Green Fodder : 2 kg x 110 x 300 x 30 np / kg	Rs. 19,800/-	
	Medicine: Adult Rs.30 x 42 : Rs.1,260; Kids Rs.15 x 110: Rs.1,650	Rs. 2,910/-	
	Labour Charges 1500 x 2 x 12	Rs. 36,000/-	
	Total Variable Cost	**Rs.1,24,500/-**	
	Total Expenditure (II + III)	**Rs.2,12,500/-**	
IV. Income			
	Sale of kids		
	110 kids x 25 kg Pwt x Rs.90 / kg Pwt	Rs.2,47,500/-	
	Sale of Gunny Bags 125 bag x Rs.8/-	Rs. 1,000/-	
	Manure 10 Ton x Rs.500 / ton	Rs. 5,500/-	
	Total Income	**Rs.2,54,000/-**	
	Net Profit - V – IV **2,54,000 - 2,12,500**	**Rs. 41,500/-**	
	Net Profit / Kid : 41,500 ÷ 110	**Rs. 377.25/-**	

Economics of Piggery Farm (10+2)

Assumption			
1.	Minimum space requirement 20 Sq.ft / animal		

2.	Breed of Choice - Largewhite Yorkshire		
3.	Concentrate Feed – Own mixed		
4.	Feed Conversion Ratio (FCR) : 3:1		
5.	Family Labour - To Reduce Cost of Prodn.		
6.	Marketing Should be Direct		
7.	Good Management Practices - Timely Treatment for Diseases		
a)	*Cost of Animals*		
	10 Sows @ Rs.4,500/-	Rs. 45,000/-	
	2 Boards @Rs.5,500/-	Rs. 11,000/-	
	Total Cost of Animals	**Rs. 56,000/-**	
b)	*Cost of Building*		
i.	12 x 40 Sq.ft / Pig @Rs.100/- $Sq.ft^{-1}$	Rs. 48,000/-	
ii.	500 Sq.ft for piglets @Rs.100/- $Sq.ft^{-1}$	Rs. 50,000/-	
iii.	Equipments & Misc.	Rs. 22,000/-	
	(a + b) Total Fixed Cost : 56,000 + 1,20,000	**Rs.1,76,000/-**	
		II. Recurring Expenditure	
i.	Interest of Fixed Cost @ 16%	Rs. 28,160/-	
ii.	Insurance 5% (Rs.56,000/-)	Rs. 2,800/-	
iii.	Miscellaneous expenses	Rs. 3,040/-	
iv.	Depreciation 10% (Building & Equip)	Rs. 12,000/-	
	Total Recurring Cost	**Rs. 46,000/-**	
III. Variable Cost			
i.	Cost of Conc. Feed for Adults 3 kg x 12 x 365 x Rs.6.50 / kg	Rs. 85,410/-	
ii.	Cost of Conc. Feed 180 piglets x 240 kg x Rs.6.50 / kg	Rs.2,80,800/-	
iii.	Cost of Medicines Adult Rs.300 / pig x 12	Rs. 3,600/-	
	Piglet Rs.50 / piglet x 180	Rs. 9,000/-	
iv.	Labour 1500 x 12 x 2	Rs. 36,000/-	
	Total Variable Cost	**Rs.4,14,810**	
IV. Total Expenditure (II + III)		**Rs.4,60,810/-**	
V. Income			
i.	By Sale of 180 Piglets 180 animals x 80 kg Rs.50 /kg Pwt	Rs.5,76,000/-	
ii.	By Sale of 15 Tonnes Manure @ Rs.300/- ton.	Rs. 4,500/-	
iii.	By Sale of 1000 Gunny Bags @ Rs.8/ bag	Rs. 8,000/-	
	Total Income	**Rs.5,88,500/-**	
	Total Expenditure	**Rs.4,60,810/-**	
	Net Profit V - IV	**Rs.1,27,690/-**	

Ex .No: 12 **STUDY OF EXTERNAL PARTS OF FOWL.**

DATE: **PREPARATION OF BROODER HOUSE**

Objectives: 1. Poultry refers to all birds that are useful to human -beings including chicken, duck, turkey, quail and pigeon. The external parts of a fowl are essential to study the different characteristics of breed including external anatomy.

Knowledge about external parts helps in differentiating good layers from poor layer based on phenotypic characters.

Broadly the external parts of a fowl is studied under four major segments.

1. Head - a) beak, b) nostril, c) comb, d) ear, e) wattles
2. Neck - a) hackle/Neck , b) crop
3. Body - a) cape, b) Back, c) saddle
4. Legs - a) thigh, b) hock, c) shank d) Toe, e) Toe nail f) Spur

I.Head

This is the anterior most part of the body. This consists of essential sensory organs of the body. The various parts of fowl are.

Beak: This is the hard structure. It consists of two parts

1. Upper beak
2. Lower beak

Nostril: It is the breathing pore of the fowl.

Comb: It is the red portion found above the head; it consists of
1) base 2) blade 3) points of comb

Eyes:-

a) Upper eye lid
b) Lower Eye lid
c) Nictitating Membrane.
d) Eye lashes are absent.

Ear: It is found below the eye region and it is covered with a soft white structure called ear lobe.

Wattles: It is the paired red coloured sac like structures found beneath the lower beak region.

II. Neck

a) Hackle.
b) Crop.

In the neck, feathers are found in females. In male, hackle is found on the neck region.

III. Body

a) Wings: Wings are found on either side of the body which is the modified forms of fore limbs; on ventral side of the wings wing web is found where vaccination is done.

b) Cape: The first part of the body in the inter scapular region is called cape.

c) Back: Middle dorsal part of the body is Back. The back portion consists of wing feathers.

d) The distal dorsal part of the body is saddle.

e) Saddle: The saddle portion is completely covered with saddle feathers.

WINGS:

LEGS: This consists of following parts.

a) Thigh : The region above the hock joint

b) Hock: The joint beneath the thigh region.

c) Shank: The region beneath the hock joint.

d) Spur: Claw like structure on the back or posterior side.

e) Toes: They are the projecting structure, which helps in walking . Each at the tip has toe nail or claws.

f) Web: found between the toes.

g) Fluff: The feathers found between the limbs.

h) Tail: Tail coverts:

1. They are the tail feathers found after the saddle feathers .
2. Sickle feathers: they are long sickle shaped tail feathers.

Auricular Tract feather - Ear feathers.

Dorsal cervical tract feathers - hackle.
Primary Feathers.
Secondary Feathers.
Ventral cervical tract feathers - front of neck plumage.
Inter scapular tract feathers - cape.
Back plumage – Back
Dorsal pelvic tract feathers - Saddle.
Upper median tail feathers - Tail coverts.
Abdominal tract – Fluff
Cloaca Feathers.

Preparation of Brooder

Brooder means to give a heat source by artificial means for the period of growth of chicks from 0 day(Day old) to 4 weeks. The heat source generally has a large reflector (Hover) under which the chicks will get the heat uniformly.

Aim :

The day old chicks do not posses the insulating feather coverage to protect them from cold. It may result in the losing of body heat to the environment resulting in chilling, which will create the ground for many diseases.

Preparation of Brooder and daily routine work carried out in the farm

Objective

Chicks do not possess a well-developed thermo- regulatory mechanism. The day old chicks don't posses the insulating feather coverage to protect them from chilliness. The body temperature of chick is 107^0 F, which is always, more than the ambient temperature. It may result in the losing of body heat to the environment. So a source of heat is given by natural brooding or by Artificial brooding up to 4 weeks of age.

Materials required

Hover or wooden cross bar. Automatic brooder, fuel heaters like lantern.

1. Bulbs
2. Chick guard
3. Thermometer (0 to 110^0 F)
4. Waterer
5. Linear feeder,
6. Lime powder
7. Lysol
8. Sprayer
9. Coirpith, GN husk or paddy husk
10. Waste news paper
11. Flame gun
12. Automatic vaccinators .
13. Debeaker
14. Bucket
15. Broomstick
16. Rake
17. Electrolyte
18. B Complex and Vitamin A
19. Antibiotics
20. Lasota F_1 Vaccine
21. IBD Live vaccine

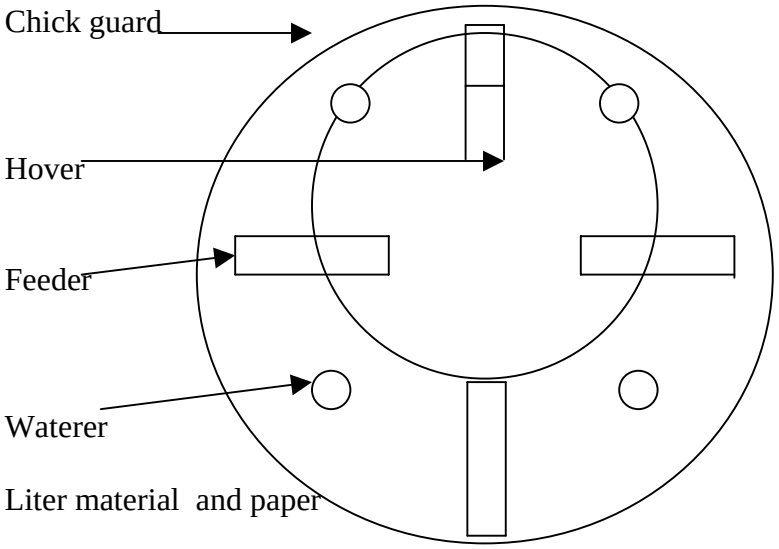
Preparation of Brooder house

1. The litter material of the previous batch should be heaped up first so that building up of germs could be destroyed.
2. After 2 to 3 days the heaped up material can be removed from the brooder room.
3. The portion of the litter sticking over the ground must be scraped and removed.
4. The removal of spider web, cob webs and dirt are also essential.
5. The floor and sidewalls should be washed with plain water.
6. Disinfection of the room is carried out by spraying phenyl, lysol, etc at 5% concentration.
7. Use Flame gun to destroy the insects.

8. The entire floors and side walls should be white washed with fresh limestone.

9. Feeders, waterers, , chick guards should be washed and disinfected in phenyl or lysol. Dry it in the sun for a day.

10. Hang the gunny bags around the brooder house to maintain the room temperature to maintain temperature note below 80^0F in the first week 75^0F in the 2^{nd} week 70^0F III week, 65^0F -IV week.



Decide on the no. of brooders depending on the number of chicks ordered

1. Connect the chick guards in circular fashion with diameter of 5 feet to accommodate 150-200 chicks.
2. Spread the litter material like coirpith, or paddy husk or ground nut husk on the prepared floor to a depth 2 inches.
3. The litter material is to be covered with newspaper.
4. The feeders and waterers are to be arranged in a radiating fashion from the light source.
5. 4 hours before the scheduled arrival of chicks place the waterers with water in order to bring water to room temperature.
6. The brooding unit should be kept ready at least a day before the arrival of chicks.
7. The brooding bulb must be switched on atleast 24 hours earlier to make the area warm at the time of housing the chick.
8. Depending on weather condition put curtains on all four sides of room to maintain room temperature.

Brooder Management

1. Spread finally grained maize over the news paper before the arrival of chicks.

2. Give cool water after boiling. Add electrolytes, B Complex and antibiotics.
3. Distribute chicks equally after counting under the brooders.
4. Before putting chicks under the brooder scale their beaks with water.
5. For first 3 days provide crushed maize twice a day. Also provide ground maize in the feeder.
6. Change newspaper sheets immediately if they get wet.
7. Remove newspapers on 5^{th} day.
8. Remove wet litter under waterers immediately and add fresh litter.
9. On fifth day give Lasota F_1 Vaccine.
10. According to the age of the birds brooder temperature should be adjusted .
11. Medication and vaccination
    a) 1^{st} day give 5% glucose in water.
    b) 2^{nd} to 4^{th} day - antibiotic + Vit.A + B Complex.
    c) 5^{th} day - RDVF vaccination
    d) 10^{th} day - IBD vaccination.
12. Daily morning and evening wash the waterer and give freshly boiled and cooled water.
13. Give 24 hrs. light up to 3 weeks to induce night feeding.
14. Debeaking is done at 2^{nd} week to prevent cannibalism and feed wastage.
15. Chick mash should contain 22% protein and 2800 kcal/kg ME

Observation

Watch the chicks under light, if chicks are spread uniformly under the light and brooder area, then the temperature maintained is correct. If the chicks are huddled under the light, heat provided is not enough.. If the chicks are away from the light source, the heat intensity is high. Give enough space for watering and feeding for growing chicks according to the age of the birds..

EX.No.13

Date: IDENTIFICATION OF LAYER AND NON LAYER

It is essential to identify the Non -laying birds from the laying stock often so as to maintain the farm economics on a healthy plane. Periodic culling of birds with

1. retarded growth
2. deformities
3. Lower production potential and
4. Disease should be resorted to

Culling helps in maintaining a more uniform flock health as the above mentioned groups may predispose to problems like disease out breaks , extra feeding costs etc.

By examining the following features in poultry the layer birds and non-layers can be differentiated.

Character	Good layer	Non layer
Head	Strong; flat on top; well balanced and broad.	Weak, long and narrow or gable-headed with curved skull (crow headed).
Face	Lean; good red; fine texture.	Fat; fleshy; coarse-skinned or pale and thin.
Comb and wattles	Large, Red, shiny and lopped. Fully extended; red and waxy.	Shriveled, pale dull and straight. Shrunken; dry and dull in colour.
Eyes	Large, Bright and Moist. Full; prominent; bright; set well up and forward in the skull.	Dull and Sunken. Small; sunken; dull; set low and far back in the skull.
Earlobe and beak	Pale and Bleached	Yellowish
Body or carriage	Long chest, wider body. Broad; width carried well through to tail; deep, well-sprung ribs; straight breast bone.	Narrow chest and narrow body. Narrow, weedy type or coarse type with round, thick bones.
Abdomen and Handling qualities	Soft fat. Skin of the abdomen very soft and pliable, absence of fat; Soft and fine,	Coarse, thick dry skin of the abdomen, with hard thick layer of fat beneath the skin.
Pelvic Bones	Soft pliable and wide. Thin; pliable free from fat.	Hard and narrower. Thick; stiff; often covered with fat.
Legs(Shank)	Slender, squarely set and bleached	Round and yellowish
Vent	Large, oval shaped moist and bluish tinged.	Small, round ; dried up.
Pubic space	Inter pubic space is wide- 2-3 finger space.	1 - 2 fingers

Character	Good layer	Non layer
Moulting	Late moulting annual seen for a shorter duration(rapid).	Irregular seen for a longer duration.
Shanks	Thin, flat, with smooth neat scales.	Round and fat, with coarse

		scales.
Feathers	Tight and well worn; late, rapid moulting	New and clean, sometimes loose and badly carried; early slow moulting.
Capacity	If laying, 4--5 fingers distance between end of breast bone and the pelvis.	Only 1-2 fingers between pelvis and breast bone; pelvic bones close together.
Yellow colour (Yellow pigmentation)	Entirely absent in vent, eyelid, beak and shanks.	Present in vent, eyelid, beak and shanks.

As culling looks to be a continuous process the birds in a flock could be maintained by adopting the above considerations for economic and viable running of the farm.

Ex.No:14. DEMONSTRATION OF BEAK TRIMMING, DELICING,
Date : DEWORMING AND VACCINATION - IN POULTRY

Vaccination

It is correctly pointed out that " Prevention is better than Cure ". Many viral diseases cannot be treated but can be controlled only by preventive vaccination.

1) Routes of administration

Administration through 1) Drinking Water : It is time and labour saving method. Vaccine is reconstituted in cold drinking water along with skim milk powder at the rate of 4 gram per litre of water and used immediately. For example RDV Lasota Vaccine.

2) Intra ocular -Intra nasal instillation.

The vaccine is reconstituted in normal Saline solution. One drop of diluted vaccine is applied to the nostrils or eye. Ex : RDVF . The virus particle gets absorbed in the mucous membrane and immunization is obtained.

3) Spray Vaccine

Spray or mist spraying is done in chick boxes in the hatcheries. Small drops of equal size is sprayed and the boxes are allowed for 10 to 15 minutes for drying. Drying should not be done near light or by hot air.

4) Wing Web puncture method

Fowl pox vaccine is reconstituted in 50% glycerol saline and taken in forked needle and vaccination is done by puncturing through wing web. Care should be taken that muscle, nerve and blood vessels are damaged by the vaccination.

5) Feather Follicle Method

Pigeon pox vaccine is reconstituted with 50% glycerol saline. After plucking of the feather follicles in the internal thigh region, with the help of a glass rod, the vaccine is smeared and rubbed . After 5 days the birds have to be examined for "Takes" . Takes are cellular reaction taking place in the nervous system.

6) Subcutaneous injection

Ranikhet K vaccine is reconstituted with normal saline and 0.5ml is given between two layers of skin in the wing web region without damaging nerves, blood vessels and muscle. The vaccine should be protected in icebox during vaccination and should be used within one hour.

S.No.	Age	Name of the vaccine	Route of administration
1.	1st day	Marek's Disease vaccine	Subcutaneous injection at Hatchery
2.	7th day	Ranikhet Disease F Strain/Lasota. RD killed.	Eye drop or Nasal drop.0.2 ml S/C.on the same day
3.	14 to 16 days (II week)	Infectious Bursal disease(live) IBD(killed)	Eye drop 0.2 ml. S / C on the same day
4.	21 to 24 th day (III week)	Infectious Bronchitis	Eye drop
5.	30 to 35 days	Ranikhet disease-Lasota strain	Eye drop
6.	42 to 45 days	Infectious Bursal disease (live)	Eye drop
7.	56 to 70 days (8-10 th week)	Ranikhet disease "K" (Mesogenic)	Subcutaneous
8.	84 to 91 days (12 - 13th week)	Fowl Pox vaccine	Wing web puncture or Intramuscular
9.	91 to 98 days (13 to 14th week)	Infectious Bronchitis Vaccine	Through Drinking Water
10.	126 to 133 days	Ranikhet disease K" (Mesogenic)	Subcutaneous Injection
11.	After peak production , every 8 Weeks	Ranikhet Disease Vaccine "Lasota"	Through Drinking Water

1. Live vaccine and killed vaccine should be administered on the same day by different persons.
2. The IBD vaccine should be administered only in the out break area.
3. In the pullet(nearing egg laying stage)or during out break of Ranikhet disease the RDVK vaccine should be preferred toLasota strain.
4. Before RDVK vaccination the birds should be dewormed.

Beak Trimming

It is recommended to trim the beaks of the layer birds to control feather pecking and cannibalism, bullying. It is carried out by means of electrocautery. It is important to remove only one third of the upper beak taking care to avoiding tongue. It is usually practiced at the age of 10-14 days and repeated at the age of 14-16 weeks. Beak Trimming should never be done with penknife.

Overcrowding, inadequate space for standing/ feeding/ watering and resting, starvation, external wounds, less fiber diet and deficiency of vitamins and minerals may pre dispose the birds to cannibalism.

Procedure

The bird has to be restrained by holding wings and legs by left hand and the tongue is pushed backwards by opening mouth and introducing index finger so that the tongue is not cut The upper beak is cut to 1/3rd of it's length and the lower beak is slightly trimmed.. After Beak trimming vitamins and antibiotics are to be administered for 3-5days to avoid stress and secondary infections.

Deworming

Is the process of removing worms from digestive tract of the birds. The tapeworm passes segments and is consumed by intermediate host (earthworm, cockroach) where intermediate stage get developed and passed out, which inturn is consumed by host. The eggs or ova of round worms are passed in the droppings which is picked by other birds directly or indirectly with the help of chance carriers (personnel, insects, flies, ants, etc). Sometimes wild birds such as crows may serve as source of infestation.

Birds show the following symptoms when they are infested with worms

1 Dullness- weakness, emaciation
2 Paralysis-due to toxins produced from worms
3 Enteritis-diarrhea with blood
4 Anemia-due to sucking of blood by worms.
5 Drop in egg production.

If infestation is on a larger scale there may be mechanical block of intestinal lumen and some times rupture occurs. This may also result due to intestinal stasis of food particles.

Deworming is practiced at intervals of 45days in layer birds and also before RDVK vaccination. Deworming is done against tape worms only on absolute necessity.

Delicing

Is the process of removing of external parasites like ticks, mites and fleas which suck the blood from the bird .The following symptoms are observed during external parasitic infestation: itching, restlesness, external wounds, loss of body weight, weakness, anemia and drop in production.

Procedure

The dipping of the birds in sunny days has to be done with the following chemicals to remove the external parasites.

1. sumathion or malathion -5ml in 100ml of water. The bird has to be immersed in the chemical solution avoiding eye and mouth. The dipped one has to be dried in a separate enclosure. The feeders, waterers and building should be sprayed with this chemical solution to remove the external parasites. After dipping, to relieve stress to the bird vitamin A, B complex has to be given to improve the health of the birds.

Ex.No:15 Economics of Layer and Broiler Farming
Date :

Economics of Layer - 10,000 layers in Deep litter System

Assumption				
1.	Floor space - brooder and Grower - 1 Sq.feet Layer - 2 Sq.feet			
2.	Cost of construction of shed		Rs.60/sq.ft.	
3.	Cost of equipment - feeder, waterer		Rs. 10/-	
4.	Cost of chick mash Grower and layer		Rs. 8/- Rs. 7/-	
5.	Feed requirement upto 8 weeks : 2 kg. 9 to 20 week : 6 kg. 21 to 72 weeks : 40 kg.			
6.	Cost of day old chick		Rs. 13.50/-	
7.	Cost of labour		Rs.40/day	
8.	The mortality from day old to 72 weeks of age is 5% and it is equivalent with extra chicks provided by the company.			
9.	Hen housed production		280 eggs/ year	
10.	Sale price of egg		Rs. 1.30	
11.	Sale price of culled bird		Rs.40/- bird	
12.	Insurance rate		Rs.2 / bird	
13.	Rate of interest on capital investment		15%	
14.	The cost of gunny bag		10	
15.	The depreciation value equipment building		10% 5%/Annum	
16.	Cost of medicine, litter, electricity.		Rs.5/- bird	
17.	The cost of manure (40 birds - 1 year - 1 tonne)		Rs.300/- tonne	
I.Fixed investment				
a.	Shed for brooder & Grower upto 20 weeks	10,000x60	6,00,000	
b.	Shed for Layer	20,000x60	12,00,000	
c.	Cost of equipment feeder, waterer	10,000x10	1,00,000	
	Total fixed investment		19,00,000	

II.Fixed Cost				
a.	Interest on fixed investment (15%)	4 ,27,500		
b.	Depreciation on building (5%)	1,35,000		
c.	Depreciation on equipment's (10%)	15,000		
d.	Insurance (Rs.3 /bird)	20,000		
e.	Labour - 3 nos @ Rs.1200 / month x 12+6	64,800		
f.	Miscellaneous expenditure	800		
	Total Fixed Cost		6,62,300	
III.Variable Cost				
a.	Cost of chicks: 13.50 x 10,000	1,35,000		
b.	Cost of feed : Chick mash 10,000 x 2 kgxRs.8 Grower mash 10,000 x 6 kg x Rs.7 Layer mash 10,000 x 40 kg x Rs.7	 1,60,000 4,20,000 28,00,000		
c.	Cost of medicine, electricity etc., 10,000 x Rs.5	50,000		
	Total Variable Cost		35,15,000	
IV.Returns				
a.	Sale of eggs: 280 x 10,000 x 1.30	36,40,000		
b.	Sale of culled birds Rs.45/birds x 10,000	4,50,000		
c.	Sale of manure 250 tons x Rs.300	75,000		
d.	Sale of gunny bags 6,400 bagx Rs.10/-	64,000		
	Total return		42,29,000	
V.Net Returns				
a.	Total Cost (TFC + TVC)	6,62,500	41,77,500	
b.	Net return (TR - TC)	41,77,500	51,500	
c.	Net return / bird	51,500÷ 10,000	5.15	

Economic of Broiler Production

Assumption

1.	Floor space requirement	=	0.75 sq.ft	
2.	Cost of construction of shed	=	Rs.75 / bird	
3.	Cost of equipment	=	Rs.10 / bird	
4.	Cost of day old chick	=	Rs.9 / chick	
5.	Price of broiler feed	=	Rs.10.10/kg	
6.	Cost of medication and electricity	=	Rs.5 / bird	
7.	Labour cost	=	Rs.45 / day	
8.	Total no. of chicks	=	200 + 4	
9.	Mortality	=	7 birds i.e. 3.4%	
10.	Depreciation of building	=	5%	
11.	Depreciation of equipment	=	10%	
12.	Cost of manure (60 days)	=	Rs.332.00	
13.	Quantity of feed consumed by birds	=	637.5 kg	
14.	Average wt of bird	=	1.73 kg	
15.	Sales cost of a bird	=	Rs.35 / kg	

I. Fixed investment

1.	Cost of building	=	Rs.75 x 200	=Rs.15,000	
2.	Cost of equipment	=	Rs.10 x 2000	=Rs. 2,000	
				Rs.17,000	

II. Fixed cost

1.	Interest on fixed investment	=	$17{,}000 \times \frac{15}{100} \times \frac{1}{6}$	= Rs.525	
2.	Depreciation on equipment	=	$2{,}000 \times \frac{10}{100} \times \frac{1}{6}$	= Rs.33.3	
3.	Depreciation on building	=	$15{,}000 \times \frac{5}{100} \times \frac{1}{6}$	= Rs.125	
4.	Labour cost	=	Rs.2025.00		
5.	TOTAL FIXED COST	=	Rs.2483.3		

III. Variable cost

1.	Cost of chick = 9 x 200	=	Rs.1800		
2.	Cost of feed	=	Rs.6438.75		
3.	Cost of medicine & electricity	=	Rs.1000.00		
	Total Variable Cost	=	Rs.9238.75		
	Total Cost Incurred	=	Rs.2483.30 + Rs.9238.75		
		=	Rs.11722.00		

IV. Total returns

1.	Total sale of chicks	=	Rs.340.5 kgs x 35 =	Rs.11,918/-	
2.	Cost manure (60 days)	=	Rs.332.00		
3.	Cost of gunny bags	=	10 x 9 = Rs.90		
	Total Returns	=	Rs.12,340		

V. Net returns

=	Total returns	-	Total cost		
=	Rs.12.340	-	Rs.11722.00		
=	Rs.618				
=	>Net returns / bird =	Rs.618 --- 200	= Rs.3.09 per bird		

Ex No. 16 DEMONSTRATION OF DRESSING CHICKEN FOR TABLE.

Date:

Selling poultry alive is the simplest and easiest method but in many cases it is more profitable to sell a poultry as dressed that is ready to cook for consumer use.

The term dressed fowl refers to birds which have been slaughtered and bled and have had the feathers removed. Dressed broilers are usually sold as freshly killed poultry.

Starve the birds for 12-24 hours before slaughter.
Conduct ante mortem examination for any disease. If disease is present it will make the bird unfit for slaughter.
Killing or slaughtering

(i) Kill the bird humanely after making the bird unconscious. This should be done by stunning or by electrical means or by piercing the hind brain.(pithing)

(ii) Stunning should be done either by a stiff sharp blow on head or electric means using 90 watts for half a second.

(iii)Pierce the hind brain with a sharp needle.

(iv)Then slaughter the bird by cutting the jugular vein in the neck.

Bleed the bird for 2-3 minutes by hanging the bird with the head down. Incomplete bleeding will lead to poor quality of meat.

Scald the killed bird for easy defeathering. Scalding should be done by immersing the slaughtered bird in hot water with a temperature of 60^{o}C for 2 minutes.

Then, de feathering should be done either by hand or in feather plucker. Dry plucking of feathers with hand can also be done if the bird has been pierced on the hind brain.

Remove the pin feathers by using flame gun. This is called as singeing.

After singeing, wash the bird thoroughly in clean water.

Remove the head with the help of a sharp knife at the joint between head and neck. The removal of head is called decapitation.

Then, remove the feet by cutting at the tarso meta-tarsal joint. This should be done to avoid dirt from the feet and legs soiling the meat.

Making a slit at the base of the neck, remove the crop.

Remove the oil gland or pre-vent gland adjoining to the vent region prior to evisceration.

i. To perform evisceration, make a 'V' shaped cut or incision in the space between vent and the breast bone.

ii. introduce three fingers into the abdominal cavity

iii. Try to hold the gizzard.

iv. Bring out all the abdominal contents cautiously except reproductive organ.

v. Take care not to damage the intestines while bringing out visceral contents.

vi. Otherwise, contents from damaged intestines will soil the carcass leading to contamination and poor keeping quality.

vii. Then, remove the reproductive organs separately.

After evisceration conduct postmortem examination on internal organs and look for lesions indicating any disease.

Remove the liver and gizzard from the abdominal organs and heart from the chest cavity. The liver, gizzard and heart are collectively called as giblets which are edible. After removing the lungs and kidneys, wash the carcass thoroughly. Then the washed carcass is to be drained completely before precooling followed by chilling. Draining is necessary since undrained birds if packed will produce a coating of diffusely irregular forms or ice layers that affects uniformity in appearance of carcass.

The dressed chicken is now ready to cook.