AmbujaNeotia

THE NEOTIA UNIVERSITY

ज्ञानम् आत्म प्रदीपाय

LIVESTOCK AND POULTRY MANAGEMENT
PRACTICAL MANUAL
COURSE NO: CCAGP 325
CREDITS: (3+1)

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PRACTICAL LESSON-1.
EXTERNAL BODY PARTS OF FARM ANIMALS

OBJECTIVES: To be acquainted with the external body parts of different farm animals and poultry.
To study the breed characters and judging of animals. Locating the external abnormalities of the body. To indicate the parts in reports like treatment, dressing of parts, post mortem report etc.
PROCEDURE:
1. Put any available farm animal in a trevis and study its body parts.

EXERCISES:

1. Give 5 reasons why we need to know the external body parts of the animals.
2. Draw a cow and label the external body parts of it.
3. Draw a poultry bird and label its external body parts.
4. Draw and label the external body parts of goats and sheep
5. Draw and label the external body parts of pig.

Also look for Youtube video: https://www.youtube.com/watch?v=4hAc_Deo9NY

PRACTICAL LESSON-2
HANDLING/CONTROLLING OF ANIMALS

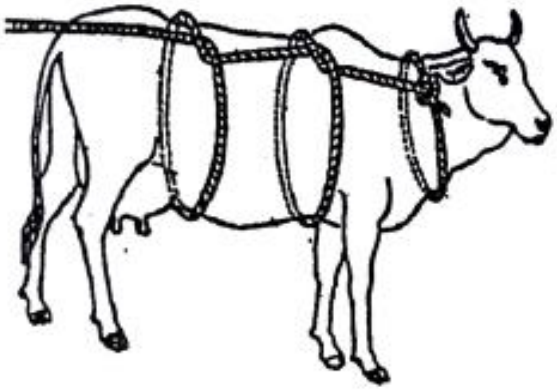
OBJECTIVES: The best occasion to examine individual cows is at milking time when they.are in stanchions. Rarely cows are examined in loose pen or paddock. However, when it is necessary to do so, all the cows or group of them including the particular cow should be driven into a pen and allowed to eat from .a manger, which is filled with fodder. Then it would be easier to hold any particular cow. Cattle apparently consider objects held in the hand as part of the body. Thus, by holding long sticks in either hand, one handler can extend his presence considerably to either side and thereby cut-off a very large escape for an individual or group of cattle kept loose.
However, tenderness and care should be there in handling the animal.
CONTROL OF ANIMALS:
Animals are required to be controlled temporarily for different purposes like drenching, dressing, vaccination, examination etc.

Different methods -
I, Trevis or Crush or stocks. -
These are made of hard seasoned wood or metal tubing. Temporary trevis can be improvised in villages and on farms by means of rough wooden poles. There are variations but usually it comprises four posts fixed well in ground and cemented there with two or more crossbars on each side. The front end is fitted with two or three removable bars at heights of 0.5, 1.0 and 1.5 m from ground level and the back end with one removable bar at about 0.75 m from ground. The side end and cross pieces should be smoothened inside. The inner length, breadth and height of the trevis are about 1.6m, 0.8.m and 1.3 to ·1.5m respectively.

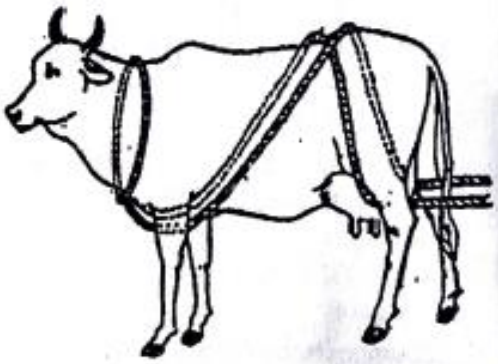
2. Casting of animals -
Casting means throwing animals on the ·ground. Casting is done if the animals are to be controlled for long time such as performing operations, shoeing, dehorning, branding etc.
Requirements - · ·
1. Casting ropes are mainly made of cotton ropes, nylon ropes, coir ropes jute ropes etc.
2. A well grown grass field, a sandy área or a bedding made of wheat bhoosa or sawdust or straws are ideal surfaces on which large animal can be cast. For casting cattle and buffaloes, a circular area of about eight meter diameter will suffice.

Method-
(i) Reuff's Method -
The· commonest and efficient method of casting cattle is by Reuff 's method.
Procedure:
At the end of an eight-meter long rope a running noose is made and the same is fixed around the base of the horns. ln case of hornless cattle the noose can be fixed to the neck. Then series of three half hitches are made - first around the neck, second around the chest immediately behind the elbows and the third around the abdomen or scrotum. The man at its head should steady the head and turn it towards the opposite side, as it has to be cast. Two men should pull the loose rope backwards and towards the side it has to be cast. The animal will crouch and sink to the

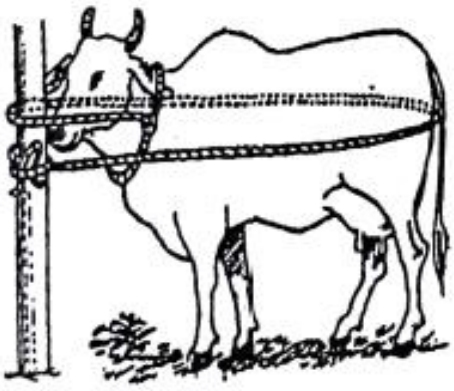
ground. After throwing the animal the man at head should keep the head pressed to the ground or turn it· over on the shoulder of the animal and keep pressing down. One man on· rope should simultaneously pass the tail forwards from in between the thighs around the topside of thigh and press its hip down. The second man on rope can then secure the animal's feet with another rope. The same operation should be carried out in reverse order for releasing the animal.



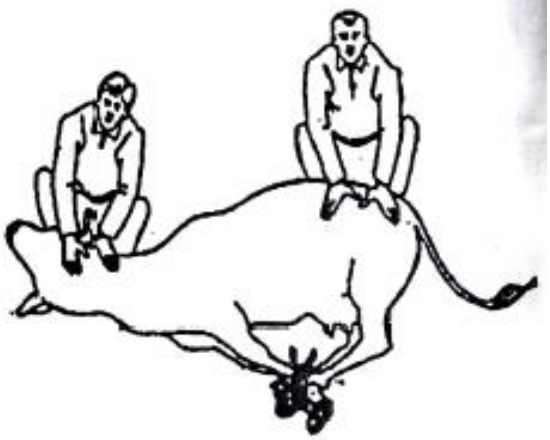
Application of ropes for reuff's method of casting



An alternative method of applying ropes for casting large animals

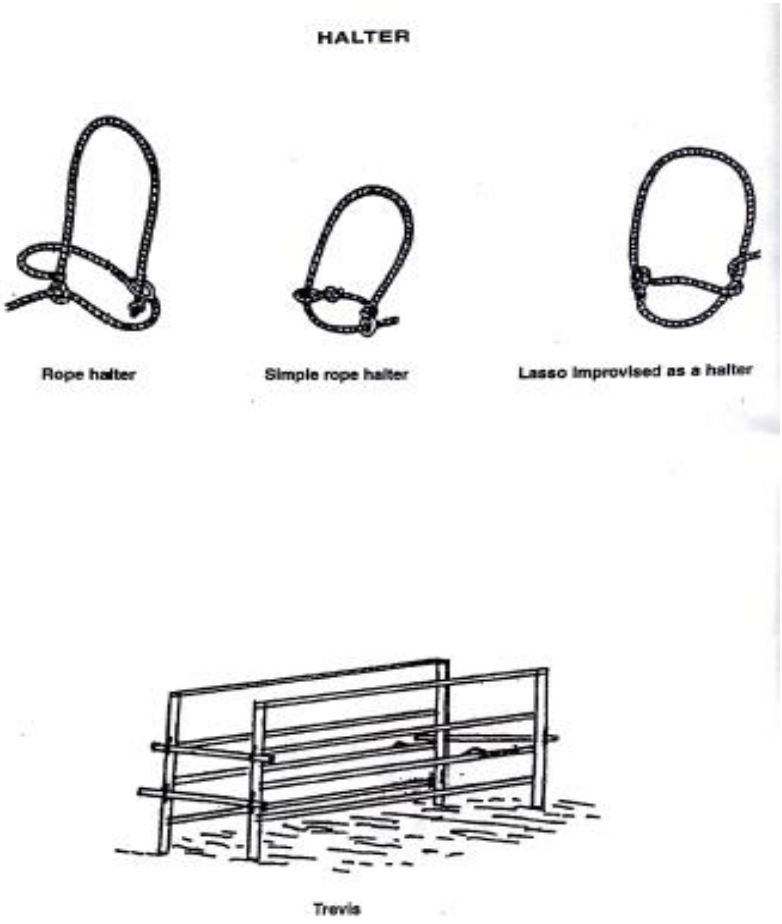


A simple method of restraining a cow in standing position



Restaining a recumbent animal

(PC: Livestock Production Management by NSR Sastry & CK Thomas)



(PC: Textbook of Livestock Production Management by NSR Sastry & CK Thomas)

An alternative method is to place the middle portion of a rope around the cows' neck and crossing the free ends under the neck. Then each free end is passed from in between the elbow backwards one on either side of the animal. Each end is passed over the loin region to the other side and then backwards between thigh and udder. The animal will crouch and sink to the ground if the free ends of the rope are pulled backwards.

Precaution

1. The comfort of the animal, cleanliness and accessibility of the site, number of men available for casting the animal, have all to be taken into consideration.
2. Though cattle can be thrown on either side, they are generally thrown on their left side.

3. Fast the animals that are to be cast for twelve hours before casting, as otherwise there is danger of injury to distended digestive organs.
4. Pregnant cows should not be cast except in necessary cases.
5. Vicious animals may be cast after using Narcotic drug.

EXERCISE
1. Draw trevis showing its measurements.
2. Draw methods of casting of animals.
3. Draw rope halter.
4. Draw bull leader, bull holder, mouth gags, bull rings.
5. Draw milk man's rope

Also look for YouTube video:
https://www.youtube.com/watch?v=k5CQ83YHwbM
https://www.youtube.com/watch?v=HrYiMViSzzo
https://www.youtube.com/watch?v=HrYiMViSzzo

PRACTICAL LESSON-3
METHODS OF IDENTIFICATION OF FARM ANIMALS

OBJECTIVE :
-To establish the ownership
-To maintain various records like history sheet, growth, reproduction, production and health cards etc.

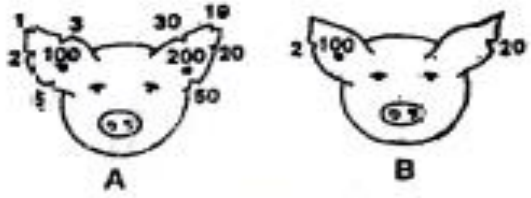
MATERIAL REQUIRED:
Depends on the method.
Tagging Ear tag, tag applicator, neck tags along with chain.
Tattooing : Tattooing machine, tattooing number, tattooing ink, scissor.
Branding Branding number,
Notching: Notching forceps.
In addition to the above said techniques for identification there are many other methods. E.g.
Leg and wing bands- commonly applied in poultry birds,
Body numbers/paints.
Hair whorls
Photographs/sketches.
Colour patterns
Electronic devices.
Procedure:
Ear Tags: They may be of plastic or metal. Select a site on the left ear in such a way that it do not have any prominent vein. Fix the tag in the tag applicator or tagging machine so that when it is applied in the ear it can be easily read from left to right.
Neck Tags: It may be of cardboard, plastic, aluminum which can be tied around the neck with the help of neck chain.
Tattooing : It is generally done in the young age. Clean the left ear from inner side with spirit. Remove the surplus hair. Fix the required number in the tattooing machine. Apply tattooing ink and tattoo the predetermined number keeping the following precautions in mind:
Try to select the area, which is light in colour,
- Prominent veins should not be punctured.
- Restrain the animal properly at the time of tattooing.
Check the number on a piece of paper before its final application.
Branding: lt can be of two types:
Hot Branding
Cold Branding
Generally branding is done at about two years of age in cattle and buffalo. In hot branding after casing the animal on the ground, the red-hot brand number is applied on the left thigh of the animal. In cold branding, the brand number are dipped in the liquid nitrogen at-190° C and applied on thigh similarly as in the case of hot branding. Both have the burning effect. Brand numbers are available both in alphabets and numerals.
Notching: Generally practiced in case of pigs (meat type animals). Notches of different shapes denoting month and year of birth are made at an early age.
Precautions : All the methods are not applicable for all species therefore firstly decide the methods to be used on a particular species and according to its age group.

EXERCISE:
Draw the diagrams of different equipments used by different techniques for identification.

BRANDING

TATTOOING

EAR TAGGING



EAR NOTCHING
A. Position of Notches and Corresponding Numbers B. No. 122

(PC- Textbook of Livestock Production Management by NSR Sastry & CK Thomas)

Also look for YouTube video: https://www.youtube.com/watch?v=shNNwwFuBCM

PRACTICAL LESSON- 4
JUDGING AND CULLING OF LAYERS

INTRODUCTION

Not all the chicks brought into a layer farm become a good laying bird. Several factors both external (outside) and internal (inside the body of a bird) may make them a poor layer. But, from the farmer's point of view, retaining a poor layer is not economical. Therefore, it is necessary to identify them as early as possible and remove them from the farm. This process is popularly referred to as "Judging" or "Culling" of layers.

Objectives

After performing this experiment, you will be able to:

- distinguish between good and poor layer; and
- identify and cull sick birds from the farm.

EXPERIMENT

Principle

Good layers will have different hormonal levels than the poor ones and while laying eggs, she makes certain changes in her body which can be identified when a layer is handled. Depending on these, a guide to identify good layers is developed which can be used by the farmers to remove (cull) poor layers early and minimize economic losses. This is undertaken at 26 to 28 weeks of age when most of the birds are expected to have started laying.

REQUIREMENTS

- Flock of layer type birds

PROCEDURE

1) Visit a layer farm.
2) Identify a bird and handle it properly as described in Experiment 3.
3) Observe for the condition of comb, eyes, vent, distance between two pubic bones, distance between tip of the breastbone and pubic bones and moulting pattern.
4) Note down your observation.
5) Give your opinion about the type of the layer bird you observed (whether a good layer or poor layer or a non-layer) based on the judging characteristics given in Table 8.1.

Table 8.1: Judging Characteristics Between Good, Poor and Non-layers

Particulars Good Layer Poor Layer Non-Layer Comb Large, red, warm Small, less warm, Underdeveloped shrunken

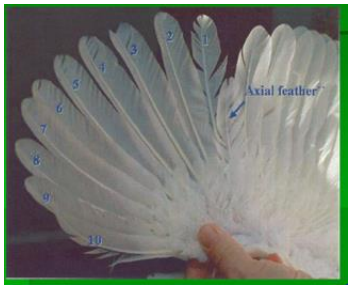
Eyes Big, bright and Comparatively Appears dull and active looks smaller and inactive less active Vent Oblong, moist and Less oblong, may Round, dry and has a pink be moist and pink yellow ring Distance At least three Less than 3 fingers Maximum one finger between two fingers pubic bones Distance At least four Less than 4 fingers, Hardly two fingers, between tip of fingers, the region not very soft very hard and the breastbone being soft and rubbery and pubic bones pliable. Moulting Not applicable Moult early and Moult late and faster pattern slowly.

Molting:

Yellow pigment, Xanthophyll is put into skin, beak, shanks and feet while bird is a growing pullet. At 16-22 weeks , the hen begins laying eggs. Bleaching is the loss of yellow pigment from the hen’s body. The yellow color goes in the egg. The pigments leaves in the order:

Vent> Eyering> Earlobe> Beak (base to tip) > Shanks > Top of feets and toes.

Birds molt from axial feathers to the wing tip. To check for molt spread out wing feathers



OBSERVATIONS:

i) Comb
ii) Eyes
iii) Vent
iv) Distance between two pubic bones
v) Distance between tip of the breastbone and pubic bones .
vi) Moulting pattern

RESULTS
i) Observe for the behaviour of chicks and adult birds while handling and note down your observations.
ii) Record the procedural differences in handling of young and adult birds.

EXCERCISES:
Draw in detail what are the methods to handle a bird.

PRECAUTIONS
• Layers should not be subjected to violent handling.
• Layers should never be held in the inverted position for more than half to one minute.

Also look for the YouTube video:

https://www.youtube.com/watch?v=m_xXc1LHDUc
https://www.youtube.com/watch?v=qi02YUFYciE
https://www.youtube.com/watch?v=Jv-biAVwmjc

PRACTICAL LESSON- 5
INCUBATION AND HATCHING

INTRODUCTION: The importance of incubators and hatcheries has helped the poultry industry grow exponentially. An incubator is basically a box that holds eggs while maintaining temperature, humidity and oxygen level.

OBJECTIVES: In this chapter we will discuss and learn how to operate, clean and manage the hatcheries. After the chapter the students will have a thorough idea about how incubator works and the procedures to do so,

PRINCIPLE: The artificial incubator works in the way how a natural brooder layer. The temperature is controlled (98-99^{o}F). The ideal moisture level is about 50-55% relative humidity and about 65% for the last 3 years. During the incubation period (1-18 days) the hatching eggs need regular turning (90o) to prevent the embryos from sticking to the shell membranes. The eggs are turned at least 2-3 times a day.

PROCEDURES OF INCUBATION:
1. Obtaining and carrying of eggs.
2. Grading and cleaning of hatching eggs- the eggs are to be graded using a weighing machine specially designed for eggs.
3. Storage of hatching eggs- eggs are to be stored at a temperature of around 50^{o}F until incubation begins.
4. Disinfection of hatching eggs- as disinfectant formalin could be used either as a powder or as a solution with $KMnO_4$ (potassium permanganate) or spirit can be used to wipe the eggs clean before the incubation.
5. A minimum of 2-3 times of turning a day is needed to prevent the attachment of the growing embryo on the shell for the first 18 days.
5. Collection of hatched chicks from the incubator after 21 days.

OBSERVATION:

1. Candling is the process of shining light through the incubated eggs and the living embro appears as a dark spot in the large end of the egg surrounded by a faint outline of blood vessels.
2. Infertile or un-incubated egg gives light bright colour. Dead embryos would sometimes appear as a ring or a smear of blood in the egg or a dark spot dried in the inside of the shell.
3. The temperature should be maintained 96- 103^{O}F, with a relative humidity of about 50-55% for the first 18 days and 65% for the last 3 days.
4. Ventilation in the incubator should be checked so that the CO_2 content inside should never exceed 0.5%.

RESULTS:
1. Count the numbers of chicks hatched against the numbers of eggs which failed to do so.
2.The chicks are to be kept in the hatchery for 1 day so it can stay warm until they are transported into a brooder.

EXCERCISES:
1. Draw a schematic diagram of an incubator.
2. Draw a diagram of an egg with its contents
3. Write the factors altering the hatchability of an egg.

Also look for YouTube video: https://www.youtube.com/watch?v=FN2twCJzZK0

PRACTICAL LESSON 6
RESTRAINING OF ANIMALS AND BIRDS

OBJECTIVE: Restraining an animal or a part of its body is sometimes necessary to examine different body parts. Also at the time of treatment of the animals proper restraining is needed to ensure the safety of the personnel and the animal. The chapter will discuss and show the ways to restrain cattle, buffalo and poultry

PRINCIPLE:
At the time of outbreaks and treatment of diseases spread quickly in flocks. Therefore, it is important to be able to tell when an animal is abnormal (physically or behaviorally). The observation of the animal in the flock one can easily rule out the dull or inactive animal. In order to examine and give treatment restraining is needed. The animal handler needs to calm the animal while restraining and thus ensure safety for the animal and the handler.

PROCEDURE FOR RESTRAINING CATTLE AND BUFFALO:
1. A lasso thrown around the neck of an animal and by means of the free rope is pulled close to a part in the shed or the beam above the manger.
2. Restraining head and neck
a) Use of hands: For examination of head of cattle an assistant standing on the left side should first grasp both horns. Then the operator should seize the nostrils and the thumb in the right. The right hand is then free for examination of any part.
(b) Use of bull holder
When examination takes a long time a bull holder should be applied to the nostrils instead of Fingers. Buffaloes are stronger and require at least two men to assist the operator.
(c) Use of month gags:
Gags are devices used for keeping the two jaws of animals apart for examination of mouth for operation on for passing a probang or a stomach tube. Drink Water's gags are most suitable for cattle. Particulars of each gag are engraved on the sides of Drink Water's gag,
(d) Using a muzzle:
Muzzles are used to prevent animals from biting, bedding - eating, self-sucking of milk, licking medicines applied on the body. Leather or rope string muzzles are more comfortable than wire muzzles. Muzzles should not be fitted too tightly as it may cause chafing of lips. At any rate, they should never put on so tightly that the tongue cannot be protruded between incisor teeth.
(e) Use of bull rings:
Bulls are generally ringed at the age of one or one and a half years. The bull is first haltered and preferably housed/fixed in a trevis. Its head is held high and tightly close to a crossbar over its head with a rope. The rings are applied through the nasal septum 1.25 cm back from nostrils. The point and socket type of rings can be pushed straight through without previous punching. But for ordinary type a hole is first punched with a bull puncher or a trocer and canula.
Precaution - Bull - puncher or trocer and canula should be disinfected before use.
(f) Use bull leader or bull pole:
It is applied in bull's nose ring and locked. The reverse should be done to release the hook,
3. Restraining legs of animals

Feet of farm animals are sometimes handled for purposes like trimming over grown hooves, dressing feet affected by foot-rot, extricating nails, thorns or glass pieces, shoeing etc.
(a) Lifting fore legs of cattle:
A rope is tied to cannon of the leg to be lifted, above fetlock, and the end is passed over the withers to the oilier side. The operator as well as attendant should allow the animal to lean on them, as the animal is apt to fall since its balance is not maintained.
(b) Lifting hind legs of cattle
For older and quiet animals a rope has to be fastened to the cannon and its free ends passed over a beam above and slightly behind the cow. Another method is to place a strong and smooth pole or solid bamboo in between two hind legs and then pull the pole upwards and backwards.
(c) Preventing cows from kicking:
(d) Several methods can be used to prevent cows from kicking. Pass the tail between the hind legs, round the hock on the same side of the operator, and hold it securely, Pull the tail whenever the animal lifts its legs to kick, as such pulling brings the weight of the animal on to the leg being lifted and thus checks the animal. Fastening a rope above fetlock of the hind leg on the milking side and tying it to a pole or ring in the wall behind is also helpful in controlling kicking.
i) Under-kinch is another device in which a doubled end of a rope is passed well up behind the udder, the two ends are brought on either side of the cow from inside her hind legs and finally a slip knot is made above her back. An attendant pulls the rope to the side away from operator. The cow will then crouch and is not inclined to kick.
(iii) Anti-cow kicker: It comprises two metal spring clips connected by a chain. It is used to control a cow while milking or for examination of the udder. The clips are fitted on the Achilles tendon region of hind legs in such a way that the chain hangs in front of the hocks. The left clip is often fitted with another smaller clip into which the tail can be fixed,.
(iv) Milk man's rope It is applied by passing a thin rope around the hind legs above hocks and then crossing rope between the legs and finally making a quick release knot of the free ends on the milking side.

For restraining poultry:
(i) Head and neck: When examining the region of the bird one should hold the bird, reach out over the back and hold the wings down. Then the bird is picked up and the fingers are inserted between the legs. If the bird appears stressed, light linen is placed over the head until the bird calms down. The head of the bird is firmly held by the free hand while the other is under the bird’s legs. The same technique is used for the examination of eyes, beak and nostrils.

(ii) Feathers and Vent: Evaluation of the feathers is important as it may reveal parasitic infestation or evidence of penmate aggression in the flock. On examination, the feathers should lay flat against the body and be well preened. Lift up the feathers and check the base of the feather shaft. This area should be clear and free from parasites. Part the feathers to check for lice and mites. Lice may lay their eggs at the base of the feather shaft, and appear as white clumps. The feathers in the tail and vent region should also be clean and free from any fecal material as white urate build-up or pasty vents may be indicative of a urinary or intestinal disease, respectively.
(iii) Breast Muscle: The muscles should be full and firm. By gently pressing fingers on the breast muscle, one can get an idea of the muscle tone. If the breastbone is easily palpated, it may be

indicative of weight loss and/or a chronic disease. Blisters appearing on the breast may indicate the bird has been down for a period of time.
(iv) Wings: The wings can be extended and examined for swelling or lacerations and palpated for broken bones and other possible injuries. The bird should not exhibit pain when the wings are extended.
(v) Legs and Feet: The scales on the feet should be smooth and closely adhered to each other and straight. Up-turned scales may be the result of a scaly leg mite infestation. The bottoms of the feet should also be free from scratches, swelling, scabs or ulcerations. The top picture illustrates nails that are too long and are in need of trimming. Long nails are often seen in birds kept in cages. The bottom picture demonstrates the beginning stages of bumblefoot as evidenced by the scabbing.

EXERCISE:
1. Draw bull leader, bull holder, mouth gags, bull rings.
2. Draw milk man's rope
3. Examine a bird and write down the observations.

PRECAUTIONS:
Do not excite the animal or the bird that may harm the animal or the animal handler.

Also look for the YouTube video:
https://www.youtube.com/watch?v=6I-vCtiRfiI
https://www.youtube.com/watch?v=1dZjwL6wsRI

PRACTICAL LESSON 7

ESTIMATION OF BODY WEIGHT OF CATTLE BY SHAEFFER'S FORMULA METHOD

INTRODUCTION:

Estimation of body weight in farm animals is essential for calculating:

a) Feed/fodder requirement;

b) Dose of medicines to be administered; and

c) .Growth of the animal against Standards/expected values.

Many farmers may not be able to buy platform balance required for weighing animals. In such cases, body weight of animals can be estimated by using certain body measurements. .

OBJECTIVE

After performing this experiment, you should be able to:

• estimate the approximate body weight of a cow by taking simple body measurements *viz.* body length and chest girth.

PRINCIPLE

The important body measurements required are:

a) length of the body, measured as the distance between the point of shoulder and the pin bone (in inches); and

b) chest girth, measured as the circumference of the chest of the animal just behind the elbow joint (in inches). ;

REQUIREMENTS

• Dairy animal (Cow or Heifer)

• Measuring tape (120 In or ,10 m long)

PROCEDURE

1) Visit a livestock farm and identify an animal to be weighed.

2) Approach, handle and restrain/secure the animal. This is particularly important because both your hands will be engaged in measuring. If the animal is excited, it will not be possible to measure and it may react violently also.

3) Measure the body length of the animal (AB) using the measuring tape in inches and note it down (Fig 4.1).

4) Measure the chest girth (C) using a measuring tape in inches and note it down.

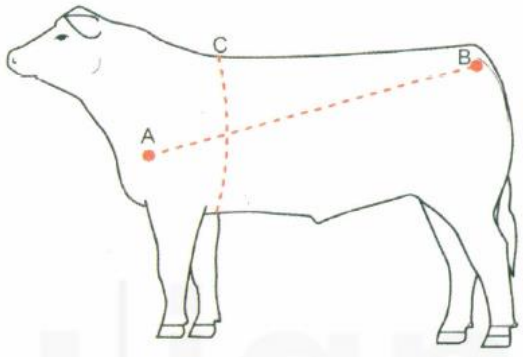


Fig 4.1: Measuring length and girth

OBSERVATIONS
Length of the body of the given animal (L) ----- inches
Chest Girth of the given animal (G) ----- inches

CALCULATIONS
Shaeffer 'sformula: This is the most commonly used formula for estimating the body weight of adult cattle and buffaloes.
Live weight in kg = (L X G^2) / 660; Live weight in pounds = (L x G^2) / 300
Note: 1 kg = 2.2 pounds; 1 pound = 0.45 kg; G2 = G x G
Where, L is the length of the body of the' animal in inches and G is the chest girth of the animal in inches. (Note: 1 inch = 2.54 cm) Note: If Land G are measured in cm,
Live weight in kg = (L X G^2) / 10815; Live weight in pounds (L x G^2)/ 4916
Results
Body weight of the given animal = kg (__ ---'pounds) as per Shaeffer's formula

Also refer to the YouTube video: https://www.youtube.com/watch?v=3smBehgi6LQ

PRACTICAL LESSON 8

DETERMINATION OF FAT PERCENTAGE BY GERBER CENTRIFUGE METHOD, SPECIFIC GRAVITY OF MILK BY LACTOMETER METHOD, AND SNF (SOLID-NOT-FAT)

OBJECTIVE:

After reading this unit we should be able to:

- Perform different platform tests to accept or reject the milk
- Determine different milk constituents
- Analyze different milk products for their quality
- Analyze the water used in dairy plant for different attributes.

INTRODUCTION

Analysis is done to know the composition of a product. Analysis determines not only the quality of the product but also the quantity of ingredients required in manufacturing. Payment is based on certain important parameters of the product. In case of milk it is Fat and SNF percent. In the industry Fat by Gerber Method and SNF by using Lactometer are estimated. In some dairies Electronic Milk Tester is used for determination of Fat in milk. Very few dairies use Milkoscans for the determination Fat, Protein, Lactose and SNF. To determine the quality of a product, tests for acidity, adulterants, preservatives etc have to be carried out. Knowledge of methods, good laboratory practices and good testing skills are required in the analysis of milk and milk products.

TESTING OF MILK

i) Determination of Milk Fat by Gerber Method:

Apparatus:

- Butyrometer 10% scale (0-10% scale with 0.1% mark)
- 10 ml automatic measure for sulphuric acid
- 10.75 ml pipette for milk
- 1 ml automatic measure for amyl alcohol
- Stoppers for butyrometer
- Gerber Centrifuge (1400 ± 70 RPM)
- Water bath (65 ± 2OC)
- Butyrometer stand
- Lock Stopper Key

REAGENTS:

Sulphuric acid (Specific Gravity 1.807 to 1.812 gm/ml at 27^{o}C) corresponding to a concentration of 90 to 91% by mass which is normally called as Gerber Acid. Amyl alcohol (Specific Gravity 0.810 to 0.812 gm/ml at 27^{o}C) conforming to grade 1 of IS:360:1964 of clear and colourless liquid shall distil between 130^{o}C to 132^{o}C.

PRINCIPLE:

Rapid Method of estimation of Fat in the fluid milk is known as “Gerber Method”. It is based on the principle of measuring the volume of Fat released from a known volume of the milk sample in a specially devised and accurately calibrated modified form of glass cylinder called Butyrometer. When a definite quantity of sulphuric acid and amyl alcohol are added to a definite

volume of milk, the proteins will be dissolved and fat globules will be set free with the help of amyl alcohol which remains in liquid state due to heat produced by the acid. During centrifugation fat being lighter (fat density 0.90 gm/ml at 40^{o}C) gets separated and comes to the top of the solution.

PROCEDURE:

- Transfer 10 ml of sulphuric acid into the butyrometer by means of automatic measure taking care not to wet the neck of the butyrometer with the sulphuric acid.
- Warm the sample to approximately 27^{O}C and mix thoroughly but do not shake it so vigorously as to cause churning of the fat. Allow the sample to stand for 3- 4 minutes after mixing to allow air bubbles to escape, invert the sample bottle 3- 4 times immediately prior to taking milk for test.
- Transfer 10.75 ml of sample into the butyrometer by using 10.75 ml milk pipette by following the below mentioned procedure.
- Add 1 ml of amyl alcohol into the butyrometer by means of automatic measure and close the neck of the butyrometer firmly with a stopper without disturbing the contents. Shake the butyrometer carefully without inverting it until the contents are thoroughly mixed, the curd is dissolved and no white particles are seen in the liquid. Then invert the butyrometer few times to mix the contents thoroughly. (It is always safe to use butyrometer stand while mixing/shaking the contents.)
- Transfer the butyrometer quickly in the waterbath at 65 ± 2^{o}C and leave it there for not less than 5 minutes.
- Take out the butyrometer out of the water bath and centrifuge at 1400 rpm for 4 minutes. Bring the centrifuge to stop gradually, transfer the butyrometers (stoppers downwards) into the water bath at 65 ± 2^{o}C and allow the butyrometer to stand for not less than 3 minutes and not more than 10 minutes and take down reading.
- Adjust the fat column within the scale on the butyrometer and take the reading.
- Use lock stopper key for fixing and removing the stopper into / from the butyrometer and also for adjusting the fat reading.

ii) Determination of SNF

Volumetric Method

Apparatus:

- Calibrated Lactometer at 15.5^{o}C, Lactometer Jar (suitable to float the Lactometer),
- Calibrated Thermometer and
- Enamel Tray.

Principle:

The constituents of milk are broadly divided into fat and solids-not-fat. The major components of SNF are proteins and lactose. Fat is estimated more easily by Gerber method. The specific gravity of milk is measured using a lactometer. Corrections are made to the reading. Fat reading is taken using Gerber method. A formula is used to work-out SNF. Some constant factor derived from gravimetric analysis is taken into calculation to get the results near to Gravimetric results.

Composition of milk (Cow/ Buffalo/ Breeds/ Season/ Feeding pattern) , the constant factor, calibration of lactometer and Adulteration play a major role in determing SNF using lactometer.With all these drawbacks it is still considered an important test along with fat estimation in the Q.C. Laboratory.

Procedure:

- Warm the milk sample to 40°C to 45°C and maintain at this temperature for 5 minutes.
- Mix the contents by rotating and inverting the bottle, taking care to avoid the formation of air bubbles and froth.
- Cool the sample approx. near to the calibrated temperature of the Lactometer (15.5°C).
- Invert the sample bottle two or three times, pour enough milk into the lactometer jar taking care to avoid the formation of air bubbles, so that some milk overflows when the lactometer is inserted.
- Insert the lactometer gently to wet the stem not more than a short length, about 3 mm beyond the position of equilibrium. The lactometer should float freely and not touch the sides of the cylinder.
- Allow the lactometer to remain steady in the milk. Take the reading at 15.5°C within 30 seconds. Note the reading of the lactometer corresponding to the top of the meniscus on the stem without the error of parallax.
- Determine the fat percentage as per Gerber Test Method.

Calculation of Solids not Fat:
Formula :

SNF%= CLR/4 +0.2 +0.29

When
CLR = Corrected lactometer reading
F = Fat Percentage
Note: The constant factor 0.29 is an example for lactometer at 15.5 degree C.
Lactometer at 84^0 F can also be used. By performing gravimetric analysis one has to arrive at the constant factor specific to the area of operation.

(iii) Specific gravity by lactometer
Materials required

- Sample of milk
- Lactometer
- Measuring cylinder
- Dairy thermometer

Lactometer
The lactometer is a special type of hydrometer. It is constructed and graduated so that the lactometer reading is related to the specific gravity of milk on the ratio of the milk to water weight of a unit volume at a specified temperature.

Principle

- The lactometer is based on the principle that a freely floating body displaces a quantity of liquid of the same weight as the floating body and that density of a solution depends on its total solids content. Of the several types of lactometer in use, the most accepted lactometers are, The quevenne lactometer - designed to determine the specific gravity of milk at 15.5°C (60°F).
- Zeal Lactometer – designed to determine the specific gravity of milk at 29° C at 84° C.
- The Watson lactometer – is applied at a temperature of 39°C.

- ISI lactometer calibrated at 27ºC is used. For temperature differences the correction factor is added.
- Measurement of the lactometer reading at a temperature below the melting point of milk fat leads to erroneous result.

Procedure

- The milk must be kept cold (40-50ºF) atleast 1-2 hour before being tested with the lactometer.
- The milk should be thoroughly mixed by being poured from one container to another until a homogenous mixture is obtained.
- The milk is then poured into a measuring cylinder having the same temperature.
- The diameter of the cylinder should be atleast 1 inch greater than the largest diameter of the lactometer and the capacity should be sufficient to float is the lactometer.
- The cylinder should be filled to such a point that when the lactometer is placed in the milk, the cylinder will over flow.
- All bubbles should be brown from the surface particularly around the stem.
- Note the reading from the lactometer when it becomes stationary.
- Specific gravity = 1 + CLR/1000 (CLR- corrected lactometer reading)
- Uses of specific gravity assessment
- Used to control composition of milk during manufacture.
- Used to estimate total solids and non-solid porition of milk.
- Used to screen sample for addition of water.

Interpretation

The specific gravity of Cow milk ranges from 1.028-1.030. and Buffalo milk is 1.030 to 1.032.

Exercises: Determine the Fat, SNF and Specific gravity of the milk sample given to you.

Also refer to the YouTube video:
https://www.youtube.com/watch?v=agdFb9qPYQs
https://www.youtube.com/watch?v=3qTEsNmcBU8

PRACTICAL LESSON -9

ECONOMICS FOR 1000 BROILER CHICKEN FARMING MODEL PROJECT

OBJECTIVES:

In order to set up a broiler chicken farm it is necessary to know the Economics of the farm so the farmer can know how much money is to be invested and the loan amount.

1. No. of birds per week	500
2. No. of batches per cycle	8
3. No. of batches in the 1st year	40
4. No. of batches from 2nd year onwards	52
5. Cost of construction of shed Rs	10/sq.ft
6. Cost of equipment Rs	12/bird
7. Cost of day old chicks Rs	20
8. Feed required per bird	4 kgs
9. Average cost of feed Rs.	16/kg
10. Wt. on selling	2 Kg
11. Selling price of birds Rs	55/Kg
12. Mortality rate	5%
13. No. of birds sold in each batch	475
14. Income from manure Rs	1/bird
15. Interest rate	12%
16. Depreciation on sheds &equip	10%
17. Average value of closing stock Rs	55
18 No. of batches not sold after 6 years	7
19. Total time for repayment	6 years
20. Beneficiaries contribution to project	16%

Expenditure on purchase of chicks, insurance, feed, cost of sheds and equipment is admissible.

Expenditure on cost of land or other buildings is not admissible.

NON RECURRING EXPENDITURE:

1. Cost of sheds (8 sheds of 500 sq.ft each) @ Rs 100/ sq.ft 4000 x 100	400000
2. Cost of store room, 200 sq ft @ 125/ sq ft	25000
3. Labour quarters, 150 sq ft, @ 150/sq ft	22500
4. Expenditure on water supply (overhead tank, bore and motor)	50000
5. Installation of electricity	25000

6. Cost of equipment (feeders, waterers, brooders etc) @ 12/bird 48000

Total 570500

RECURRING EXPENDITURE FOR 1ST 8 BATCHES:

1. Cost of chicks 4000 @ Rs 20/per chick 80000
2. Insurance @ 4% 3200
3. Cost of feed, 4kgs/bird, Rs 16/kg for 4080 birds 261120
4. Cost of medicines, vaccines etc @ Rs.5/bird 20000
5. Labour cost for 3 months @ Rs 4000/ month 12000

Total 376320

TOTAL COST OF THE PROJECT: 570500+ 376320 = 946820

ADMISSIBLE COSTS UNDER THE SCHEME: 792320
(Sheds, equipment, chicks and feed)

BANK LOAN 792320

BENEFICIARY'S CONTRIBUTION 154500

TOTAL 946820

ECONOMICS OF BROILER FARMING - FLOCK PROJECTION CHART

Year	No. of batches introduced	No. of batches sold
I	40	33
II	52	52
III	52	52
IV	52	52
V	52	52
VI	52	52

ECONOMICS OF BROILER FARMING - CASH FLOW ANALYSIS

Sl. No	**Particulars**	**I**	**II-V**	**VI**
I	Costs:			
1	Capital cost:*	570500	0	0
2	Recurring costs:			
a)	Cost of chicks	400000	520000	520000
b)	Cost of feed	1305600	1697280	1697280
c)	Insurance	16000	20800	20800
d)	Medicines	100000	130000	13000
d)	Labour cost	48000	48000	48000
Total Costs		1869600	2416080	2416080
II			Benefits	
1	Sale of birds	2090000	2717000	2717000
2	Sale of manure	16500	26000	13,000

3	Sale of gunny bags	8000	10000	10000
4	Depreciated value of			
a)	Sheds	0	0	200000
b)	Equipment (including water supply equipment)	0	0	30000
5	Value of closing stock	0	0	192500
6	Total Benefits	2114500	2743000	3162500
Net Benefits		244900	326920	746420

ECONOMICS OF BROILER FARMING - REPAYMENT SCHEDULE

Bank loan (Rs.): 792320

Interest rate: 12 %

(Rupees) Year	**Income**	**Expenses**	**Gross surplus**	**Loan Balance**	**Interest**	**Repayment Interest**	**Repayment Principle**	**Net surplus**
I	2114500	1869600	244900	792320	95078	95078	92320	57502
II	2743000	2416080	326920	700000	84000	84000	125000	117920
III	2743000	2416080	326920	575000	69000	69000	125000	132920
IV	2743000	2416080	326920	450000	54000	54000	125000	147920
V	2743000	2416080	326920	325000	39000	39000	125000	162920
VI	3162500	2416080	746420	200000	24000	24000	200000	522420

Exercises:

Make a project for 100 broiler chicken.

PRACTICAL LESSON 10:
ECONOMICS FOR DIARY FARM PROJECT FOR 10 COWS

ASSUMPTIONS

1. The cost of land for the project is not considered.
2. Inter-calving period of 390 days (300 lactating days and 90 dry days).
3. Provision for silage bunker & mister set
4. Change in market price of the animals assumed in following manner
1. Animals in 1st lactation: No change
2. Animals in 2nd lactation: +5%
3. Animals in 3rd lactation: -5%
4. Animals in 4th lactation: -10%
5. Animals in 5th lactation: -30%
6. Animals in 6th lactation: -50%
7. Animals in 7th lactation: -70%
5. Once the young animal, reared within the herd that is ready to calve, would replace the oldest animal.
6. The animals apart from 1st, 2nd or 3rd lactations are assumed to be sold off to maintain constant herd size.
7. Required land is available for cultivating green fodder for animals.
8. For lactating animals, total dry matter of feed and fodder is assumed to be in the range of 3.5-4 kg per 100 kg body weight.
9. For dry animals, total dry matter of feed and fodder is assumed to be around 2.5 kg per 100 kg body weight.
10. The project is considered as on-going and therefore, terminal values of assets are not considered.
11. Male calves are assumed to be sold off.
12. Price assumptions are on average basis and would vary region to region
13. Provision for any taxation has not been made
14. Of total 10 cows purchased

- 5 cows are of 1st lactation having yield of 15 litres/ day, costing ₹ 60,000/ animal
- 3 cows are of 2nd lactation having yield of 18 litres/ day, costing ₹ 63,000/ animal
- 2 cows are of 3rd lactation having yield of 17 litres/ day, costing ₹ 60,000/ animal

15. Of 10 animals, 5 are assumed to be purchased at the beginning of the project and rest after 6 months

16. Provision for manual chaff cutter

17. No milking machine

PROJECT DETAILS (INDICATIVE) for 10 COW FARM

Pre-requisite for the project	Square feet
Land requirement for cattle shed, storage and silage bunker	2325

Project cost

Item	Amount (₹)
Cattle shed for adult animals	420,000
Cattle shed for calves	140,000
Cattle shed for heifers	245,000
Silage bunker	37,500
Construction for storage area	233,340
Animals	623,000
Equipments	16,000
Contigency	34,300
Total Project cost	1,749,140

Fixed cost (₹)

Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Depreciation of cattleshed	103,834	103,834	103,834	103,834	103,834	103,834	103,834
Depreciation of equipment	1,600	1,600	1,600	1,600	1,600	1,600	1,600
Relative change in value of herd	-9,000	-63,000	-15,000	18,000	72,000	0	0

Interest on capital investment	209,897	209,897	209,897	209,897	209,897	209,897	209,897
Total fixed cost	306,331	252,331	300,331	333,331	387,331	315,331	315,331
Variable cost (₹)							
Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Green fodder cultivation	48,000	48,000	48,000	48,000	48,000	48,000	48,000
Green fodder cost	0	0	0	0	0	0	0
Dry fodder cost	143,904	210,240	245,280	280,320	280,320	280,320	280,320
Concentrate cost	171,976	240,576	261,016	281,456	281,456	281,456	281,456
Mineral mixture cost	15,282	21,564	23,754	25,944	25,944	25,944	25,944
Labour charges	60,000	60,000	60,000	60,000	60,000	60,000	60,000
Insurance charges	24,120	24,120	24,120	24,120	24,120	24,120	24,120
Veterinary & breeding expenses	15,000	15,000	15,000	15,000	15,000	15,000	15,000
Electricity & water charges	15,000	15,000	15,000	15,000	15,000	15,000	15,000
Transportation cost for milk sale	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Minor repair of building/ equipments	5,000	5,000	5,000	5,000	5,000	5,000	5,000
Interest on working capital	6,866	7,331	7,520	7,710	7,710	7,710	7,710
Total variable cost	506,148	647,831	705,690	763,550	763,550	763,550	763,550

Income (₹)							
Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Milk	854,120	1,200,420	1,109,160	1,031,940	1,067,040	1,165,320	1,165,320
Gunny bags	2,460	3,440	3,730	4,020	4,020	4,020	4,020
Sale of animals	2,000	2,000	2,000	62,000	134,000	122,000	224,000
Sale of dung/ manure	12,600	16,800	16,800	16,800	16,800	16,800	16,800
Total receipt	871,180	1,222,660	1,131,690	1,114,760	1,221,860	1,308,140	1,410,140
PBDIT (Operating Profit) (₹)	365,032	574,829	426,000	351,210	458,310	544,590	646,590
Net Profit (₹)	58,701	322,498	125,669	17,879	70,979	229,259	331,259
IRR	18.4%						
ROI	21.9%						

Exercise: Make a project report for 100 cows and followers.

PRACTICAL LESSON 11-
RATION FORMULATION

Ration formulation is a process by which different feed ingredients are combined in a proportion necessary to provide the animal with proper amount of nutrients needed at a particular stage of production.

- It requires the knowledge about nutrients, feedstuffs and animal in the development of nutritionally adequate rations that will be eaten in sufficient amounts to provide the level of production at a reasonable cost. The ration formulated should be palatable and will not cause any serious digestive disturbance or toxic effects to the animal.

- The nutrient requirements can be arrived using feeding standards.
- The list of commonly available feeds in that region is prepared.
- The nutritional value of the feeds is obtained from any standard source such as NRC.

Using the above information rations can be prepared by several methods that include

- SquareMethod
- Simultaneous Equation Method
- Two-by-two Matrix method
- Trial and Error Method and
- Linear Programming (LP)

Factors to be considered in ration formulations:
• Acceptability to the animal – The ration formulated has to be palatable.
• Digestibility – The nutrients in the feed have to be digested and released into the gastrointestinal tract to be utilized by the animal. Rations with high fiber content cannot be tolerated by poultry and swine.
• Cost – The requirement of the animal can be met through several combinations of feed ingredients. However, when the costs of these ingredients are considered, there can only be one least-cost formulation. The least-cost ration should ensure that tile requirements of the animal are met and the desired objectives are achieved.
• Presence of anti-nutritional factors and toxins. The presence of anti-nutritional factors in the feed affects the digestion of some nutrients and makes them unavailable to the animal. The inclusion of these feed ingredients should therefore be limited in the formulation.
• Other factors that should be considered are texture, moisture and the processing the feed has to undergo.
• This is relatively simple and easy to follow. It satisfies only one nutrient requirement and uses only two feed ingredients. Another limitation is that the level of nutrient being computed should be intermediate between the nutrient concentration of the two feed ingredients being used.

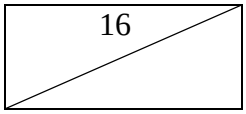
The Pearson square or box method

• The Pearson square or box method of balancing rations is a simple procedure that has been used for many years. It is of greatest value when only two ingredients are to be mixed. The nutrient requirement is noted in the middle of the square this value in the middle of the square must be intermediate between the two values that are used on the left side of the square which are actually the nutrient content of the two ingredients that are to be used. For example, the 14 percent crude protein requirement has to be intermediate between the soybean meal that has 45 percent crude protein or the corn that has 10 percent crude protein. Subtract the nutrient value from the nutritional requirement on the diagonal and arrive at a numerical value and note it down on the right side of the square. Two sets of values will be got. By summing those parts and dividing by the total, you can determine the percent of the ration that each ingredient should represent in order to provide a specific nutrient level.

SIMULTANEOUS EQUATION METHOD

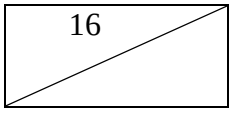
• This is an alternative method for the square method using a simple algebraic equation.
• Here, a particular nutrient requirement is satisfied using a combination of two feed ingredients.

Methods of feed formulation:
i. Pearson square method: This is a simple and easy method of determining the correct proportion of two feed ingredients to obtain a desired level of nutrient.
Limitation:
1. Only one nutrient can be considered at a time. 2. Only two ingredients can be used at a time. 3. This method can only be used when one ingredient has a higher nutritional value (nutrient being considered) and the other one has lower value than the desired level. 4. The safe maximum percentage of the ingredients cannot be followed.
Example of Pearson Square Method
- CP % is 8.8 %
Yellow corn (YC)
Soybean meal (SBM) - CP % is 45.8 %
Formulate a grower feed with 16 % CP
STEPS:
1. Draw a square and write the desired protein percentage at the center



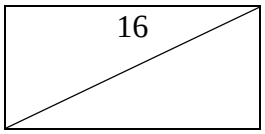
2. Write the ingredients and their protein % on the lower and the upper left hand corner

Yellow corn 8.8



Substract diagonally the lower from the higher value. Write the answers at the opposite corn of the square.

Yellow corn 8.8 298(YC)



Soybean meal 45.8 7.2 (5BM)

37.0

4. The mixture will be 29.8 parts yellow and 7.2 This can be changed parts soybean meal into percentage.

% Yellow corn $\frac{29.8}{37.0}$ X 100 80.5 %

% Soybean meal= $\frac{7.2}{37.0}$ X 100 19.5 %

or

Soybean meal 100 % - 80.5 %= 19.5 %

The mixture will be 80.5 % yellow corn and 19.5 % soybean meal.

II. TRIAL AND ERROR METHOD:

This method of feed formulation is time consuming, however all the nutrients are considered and a variety of ingredients can be used.

Example of a trial and error method:

CALCULATION OF COMPLETE DRY RATIONS:

Steps:

1. Make a list of all the available ingredients including the following daa:
   - Price per kg of ingredient
   - Energy in kcal DE
   - % Crude protein (CP)
   - % Crude fiber (CF)
   - % Ether extract (EE
   - % Lysine (Lys)
   - % Methionine cystine (MC)
   - % Calcium (Ca)
   - Phosphorus (P)

2. Calculate:

a. The price of 1000 Kcal of DE

b. The price per percent CP

3. Set the requirements for the compound feeds to be made.

Steps for the trial and error method

I. Reserve 2% for the addition of mineral and vitamin premix.
II. Take up 30 % ingredient /s which are

a. Higher in DE than the required optimum level of the formulated kind of fed to be
b. Take those which have the lowest price per 1000 DE
c. Do not include more than the safe maximum % for each ingredient.
d. Include any ingredients of which you want to take up a minimum percentage.
iii. Take up 18% ingredients /s which are;
a. Higher in % CP than the required minimum level of the kind of feed to be formulated.
Include ingredients of which you want to take up a minimum percentage.
c. Take those having the lowest price per % CP. Do not exceed the safe maximum % for each ingredient.
V. Having 50 % of the feed, add all nutrients and compare them with the Required time. Select for the next 10% of such ingredients that are balancing the feed most and which are the cheapest. At 60%, 70%, 80% and 90%, check again. For the last 10% up to 100 % (the finishing touch) you can use "Pearson Square".

PRACTICAL LESSON 12
IDENTIFICATIONS OF COMMON TOOLS/APPLIANCES/ EQUIPMENTS USED IN LIVESTOCK FARM.

OBJECTIVE:
1. To become familiar with common tools used for animal management

2. To know the way to handle and take care of such tools

3. To understand the use of such tools

PROCEDURE:

1. Place the tools in a table.

2. Study the tools.

EXERCISE:

1. Make diagram of each tools and write its use.

Also refer to the video:

https://www.youtube.com/watch?v=R2cvFqm8fEI

https://www.youtube.com/watch?v=NNztAPD6DmI

https://www.youtube.com/watch?v=89jpwD5sPFc

PRACTICAL LESSON -13
FARM OPERATIONS AND RECORD KEEPING

Daily farm routine or day-to-day operation in an ideal dairy farm

Time(hours)	Farm Operations
03.00-03.30	Cleaning/brushing of milch animals
03.30-05.00	1.Feeding half of the daily concentrate ration just before milking 2.Milking cows
05.00-05.30	1.Delivery of raw milk (in cans) to milk pick up van of dairy plants and receiving previous day's empty cans 2.Washing and disinfection of milking barns
05.30-08.00	1.Cleaning of milk cow sheds. 2.Feeding of dry/green fodder to milch stock 3.Cleaning of farm premises 4.Isolation of sick animals 5.Isolation of "in-heat" cows for artificial insemination *Note: use milkers at the rate of one for every 12-14 cows, for all the above operations. Milkers go off duty by 8 am and farm labour come on duty*
08.00-12.00	1.Cleaning calf, maternity, dry stock, bullock and bull sheds 2.Feeding half of the daily concentrate ration to calves, pregnant cows and bulls 3.Exercising and grooming of bulls 4.Treating sick animals. 5.Breeding cows that are " in-heat" 6.Harvesting, chaffing and feeding of green fodder to all the stock. Manger in all sheds should be filled with green fodder *Note: animals should be taken for grazing (if practiced) between 9 a.m and 2 p.m. in winter and between 6 a.m and 10 a.m. and again between 5 p.m. and 7 p.m. in summer*
12.00-13.00	Lunch cum rest period for labourers
13.00-15.00	Miscellaneous jobs of dairy farm like stock identification, periodical vaccination, preparation of concentrate mixture, repair of farm fences, fitting and repair of equipments, rope and halter making, weekly scrubbing and white washing of drinking water tank, manure disposal/conservation, hay and silage making, periodical spraying of animal houses with suitable pesticides, periodical deworming of stock, clipping of hair from sides and hind quarters of cows; grooming, toe trimming, dehorning of calves, attending to sale and purchase of livestock and their transportation, fitting and training of cows for show. *Note: the dairy manager should planed the jobs well in advance in such a way that they are evenly distributed over the week. Some jobs may require longer time and the labour have to work extra time on such occasions.*
	Milkers come duty by 14.30 hours and remain up to 1730 hours whereas general farm labour go off duty by 1700 hours.
14.30-15.00	Washing/brushing of milch cows by milkers
15.00-16.30	1.Feeding the other half of daily concentrate ration to milch cows just before milking 2.Milking

	3.Cleaning calf, maternity, dry stock and bull sheds and feeding the other half of concentrate ration to calves, pregnant cows and bulls
16.30-17.00	1. Delivery of milk (in cans) to milk pick-up vans of milk plants and collection of morning's empty cans. 2.Washing and disinfection of milking barns 3.Feeding dry and green fodder to calves, dry stock and bulls
17.00-18.30	1.Cleaning of milk cow shed. 2.Feeding green / dry fodder to milch stock 3.Cleaning of farm premises.
18.30-03.00	Night watchman on duty

Registers to be maintained in a dairy farm

Record Maintenance	Daily stock register Birth/calving register Calf / young stock register Adult stock register Breeding register/ AI register Weighment/ growth register Milk yield and distribution register Sales/ disposal register Mortality register Feed stock register Fodder stock register Receipt/ Income register Herd health register

Importance of record keeping

- The complicated job of management of a dairy herd requires sound planning for synchronization of all the inputs and all the factors that are chain linked to each other.
- It requires day to day planning, coordination, execution and evaluation, keeping in mind, the ultimate objective.
- This is possible only when the manager has all the facts pertaining to the stock before him. Such facts can be obtained from production and reproduction records.

On-herd uses of records

- Each animal in the herd is identified with respect to their production performance.
- Close management and appropriate feeding levels can be provided on the basis of production level.
- Efficiency of culling and selection has been increased which in turn will increase the profit rate.
- Relative influence of feeding, management and breeding can be assessed on production

performance. >

- Livestock marketing can be promoted on the basis of performance records.

Off-herd uses of records

- Comparison of herd performance between and within breeds is possible.
- Superior stock can be identified for extensive use in breeding programmes.
- Herd and breed registration programmes can be implemented more effectively.
- Realistic research, development planning and plan implementation are possible.
- It should help the dairy manager / farmer to produce more quantity of milk at lower cost.
- It should provide required data to the administrators (for planning), research organizations (for processing and analyzing the enterprise scientifically), breeders (for formulating selection and breeding programmes) and extension personnel (for getting feedback information from the farmers).

EXERCISES:

1. Visit a farm and write down the daily activities of the farm.

PRACTICAL LESSON-14
CLEAN MILK PRODUCTIONS AND METHODS OF MILKING

PRINCIPLES OF MILKING

Milking is defined as the critical and laborious process which involves hormonal reflex. The art of milking performed within 5-8 minutes. Normally milking is done twice a day. The cattle and buffaloes are exclusively maintained for milk production. Though the primary objective is to produce milk,. the amount of milk produced by the indigenous breeds are very low compared to the amount of milk secreted by the exotic animal which are very high and which is more and above the requirement of calf. If the calf is allowed to suckle the complete quantity of milk it leads to digestive disturbances, enteritis, etc., usually milk is fed to calves depending upon the body weight of the calf the rate of1/10 of the body weight during first week and 1/15 the body weight during the second week.

Hand milking: It is commonly practiced in the harvesting of milk .In order of milking of various teats also differ.

1. Teats crosswise left four and right hind or right four and left hind.
2. Fore quarters teat together
3. Hind quarters teat together
4. Teats appearing more distended should be milked first. The milk should only be squeezed and not drawn

STRIP CUP:

It is a device with four circular plates for each quarter which has the quantity of milk normally first few strip of milk are drawn in the respective circles to asses the physiological status of the udder. If there is any change in color, consistency appearance, etc., the milk should be drawn at the end so as to prevent spreading the disease from one quarter to other.

Prevention of Kicking of the cow:

1. Application of milk man's rope.
2. Anti cow kicker.

METHODS OF MANUAL MILKING.

1. Fisting 2.Knuckling, 3.Stripping

1. FISTING. In this method the whole teat is held first with the thumb and the index finger encircling the base of the teat. The base of the teat is closed by the ring formed by the finger, so that the milk that is trapped in the teat canal cannot slip back into the gland cistern. Simultaneously the teat is squeezed between the hollow of the palm and with the middle, ring and index finger. The process is repeated in succession. It is the best method of hand milking though most of the milkmen follow knuckling method.

2. KNUCKLING METHOD:Many milkers tend to bend their thumb against the teat canal and drag the milk out. This practice should be avoided as it is injurious to the teat.

3.STRIPPING:This method is followed where the length of the teat is small; it is normally practiced towards the end of milking in order to evacuate the milk completely. The last drawn milk is called stripping which is rich in fat content. The process of stripping should be done in quick succession otherwise the animal will become stripper where the letting down of milk is delayed.

MACHINE MILKING:

A calf and the machine do the harvesting of milk in a similar fashion. The function of the tongue, dental pallet and jaw movement of the calf is done by the inflation tube, pulsator and vacuum pump. Milk removal is largely dependent upon the differential pressure across the teat canal. The total differential pressure created by the milking machine is approximately 352 mmHg, in the case of cattle and 400 mm Hg.in the case of buffaloes. The pressure facilitates the expulsion of milk from the canal.

MERITS.

1. Easy method of extracting milk.
2. Does not require any skill.
3. Keeping quality of milk is high.
4. Chances of spreading of disease of the milk man to udder through milk are negligible.
5. Time consumed is less. One or two animals can be milked simultaneously and the maximum of eight animals can be milked at a time.

DEMERITS:

1. Cost is high
2. Electricity is essential.

One milking machine for – 10 animals yielding 10 litres / day will be economical to maintain.

EXCERCISES:

Draw the different methods of milking.

Draw and label the different parts of a milking machine

Also refer to the YouTube video:

https://www.youtube.com/watch?v=WHsp7KDVvzY

https://www.youtube.com/watch?v=tqfUeXnoWEI

PRACTICAL LESSON 15:
VISIT TO A DAIRY FARM

EXCERCISES:
Write in brief:

1. What is the name of the dairy farm you visited? How far is the farm from the University?

2. What types of breeds are maintained in the farm and state the numbers of calf, adult male and female cows.

3. How many farmstead buildings are there in the dairy farm?

4. What is the amount of milk given by a cow in the farm in a day and calculate the average milk production of the farm in a month.

5. What is the type of milking method used in the farm and how many times a cow is milked per day?

6. How are they discarding the animal wastes?

PRACTICAL LESSON 16
VISIT TO POULTRY FARM

EXERCISES
Write in brief:

1. What is the name of the farm you visited? How far is the farm from the University?

2. What types of breeds are maintained in the farm and state the numbers of layers and chicks in the farm

3. Is there any incubator or hatchery unit in the farm? If yes, how many eggs are incubated per day?

4. What is the amount of feeds given in the farm in a day and find out the average egg production of the farm in a day.

5. What is the type of housing method used in the farm and how many times the flock is culled or replaced in a year?

6. How are they discarding the waste materials?