**THE FEDERAL UNIVERSITY, KASHERE**

**FACULTY OF AGRICULTURE**

**DEPARTMENT OF ANIMAL SCIENCE**

ANS: 3202

Course Code: ANS 3202

Course Title: Ruminant Animal Production

No of unit: Two

Course Duration: Two hours

Status Compulsory

Prerequisite: Nil

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**Course description**

This course is very important for profitable animal production. This stems from the fact that a

Good understanding and judicious use of knowledge acquired from this course would lead to

Good management in livestock production.

**GRADING SYSTEM FOR THE COURSE**

This course will be graded as follows:

Class Attendance In form of random quizzes 10%

Assignments 10%

Test(s) 20%

Final Examination 60%

**TOTAL 100%**

***Attendance:*** It is expected that every student will be in class for lectures and also participate in all practical exercises. Attendance records will be in the form of random quizzes to determine each person’s qualification to sit for the final examination. In case of illness or other unavoidable cause of absence, the student must communicate as soon as possible with the instructors, indicating the reason for the absence.

***Academic Integrity:*** Violations of academic integrity, including dishonesty in assignments, Examinations or other academic performances are prohibited. You are not allowed to make Copies of another person’s work and submit it as your own; that is plagiarism. All cases of Academic dishonesty will be reported to the University Management for appropriate sanctions in Accordance with the guidelines for handling students’ misconduct as spelt out in the Students’ Handbook.

***Assignments and Group Work:*** Students are expected to submit assignments as scheduled. Failure to submit an assignment by certain student as at when due will earn such student zero for that assignment. Only under extenuating circumstances, for which a student has notified the instructor in advance, will late submission of assignments be permitted.

***Code of Conduct in Lecture Rooms:*** Students should turn off their cell phones during lectures. Students are prohibited from engaging in other activities (such as texting, watching videos, *etc*.) during lectures.

**Introduction:** Ruminant Animal are (four chambered stomach animal) i.e. Rumen, Reticulum, Omasum and Abomasums.

**Rumen:** Is the biggest and forages are first reduced there, the rumen contains microbes and from there digestion occurs. Domestication: Cattle, Sheep and Goat are the most Domesticated ruminant animal, the mouth part of sheep has clept nipples libs and the goat uses the incisors but the cattle use its tongue as prehensile organ. Domesticated animal species namely cattle, sheep and goat are herbivorous and have enlarge digestive tract structured to process bulk feed. Animal species with such characteristic are **ruminant or polygastric** because they posses four stomach compartment (Rumen, Reticulum, Omasum and abomasums) such a digestive tract/system provide space for processing large quantities of bulks forages necessary to produces energy and nutrient to sustain the animal. They posses high level modified organ for prehensile of feed and material. Tongue is the major prehensile organ in cattle while in sheep has clept nipper libs and goat uses incisors teeth for herbage prehensile.

**Importance of Ruminants Animal Production**

1. Production of hide and skin
2. Meet production
3. They convert fibre to manure
4. Uses as a farm power
5. Because of their small size they are handle for experimentation
6. They are value during cultural ceremonies
7. Sheep and goat are important in converting grasses to meat
8. Goat are very prolific
9. Contribute to clothing and other non-food product
10. For recreation, entertainment

**Classification of Sheep and Goat**

Kingdom - Animal

Sub-kingdom - Vertebra (barebones)

Class - Mammalian (suckle milk)

Order - Artiotyla (hooves)

Family - Bovine (hollow horn)

Sub-family - Couprinal (sheep and goat)

Genus - Ovis (Sheep)

- Coupra (Goat)

**Adult Male Female Young**

Male Female

Goat Buck Doe Kid Kid

Sheep Ram Ewe Ram/lamb Ewe

**Tropical Breed of Sheep and Goats**

1. **Merino Sheep:** These breeds of sheep develop from Spain introduced to Nigeria in 1938 from South Africa it was use for breeding and upgrading programmes. However it was found that mutton (meat) quality was low and the offspring have made very show survival rate due to climatic condition.
2. **Black Headed Persian Sheep:** These are large fat rumped breed develop from South Africa, from Somalia type of sheep. The head is black up to the neck and the rest of body is white, upgrading and cross breeding programmes are started very back in 1870 resulted in the development of **Doper breed** which is the cross breed between black head and Persian and British doset. Dopers are tolerant to disease, rapid growth rate and produce meat of good quality and were introduced to Nigeria in 1961.
3. **Karakul Sheep:** They originated from Karakul village in Asia and develop in the semi-arid area of Asia it’s highly valued for its good quality pelt (small animal skin as in rabbit) obtainable from the lamb slaughtered at 2-5 year of ages.
4. **Nubian Breed of Goat:** Is said to be widely distributed in the Nile bank of Sudan, Egypt, the breed is known for its milk production of 1.3kg/day, the breed is recognised by it unique pendulous ears same like some varieties are black while other are brown the mature animal weight about 60kg.
5. **Angora:** The Angora breed originated in Asia an domicile (situated) in China, it was introduce to South Africa 1938, the Angora are known for their hair which is called **cashmere or mohair** it perform well in seasonal dry climate. The milk and meat is the secondary for its mohair production.
6. **Saenem:** This breed of goat is found in Switzerland the coat colour vary from white to pale brown, some cream colour and black spot on the nose, ears and udder are founds they are generally polled. Saenem is one of the European goat that found on the tropic it is venerable to problem if not protected and provided with shade, this characteristic make it introduction into other part of the tropics, however it has successful introduced to Kenya, Ghana, Malaysia, it has good potentials for dairy.
7. **Boer:** Boer is among the goat most consider for meat production the female weight 75kg while the male (castrated) weight up to 100kg under moderate condition and good management both the milk and skin are rate for high quality and value, this breed was develop from native Africa goat cross with the important breed from India they survive well in tropical and sub-tropical countries

**Housing and Equipments**

Small ruminant they are very easier to manage because they are hardy and tolerant to tropical weather condition, under the traditional production system elaborated housing is not providing. In the case of pastoral system only open-end closure are provided the animal often tethered in most cases, under the extensive production system, rain, draught, intense sunshine drive the animal to take shelter under an available roof, or trees in surrounding areas however the required for housing is important as it protect animal against adverse whether condition particularly the kids and lambs which required some care during the early stage of life housing when ever provide make management easier. In an extensive system of production which resources and better attention are required housing is unavoidable. Site for housing sheep and goat should be dry not muddy, should be accessible to staff and vehicle , close to source of water and proper drainage, if drainage is not available you have to provide it, the floor should be dry, the design should be in such a way that the urine and dropping can be clean away easily. The floor should be sloping or furrow so that urine and faeces drain away. use of slated keep the floor in good condition. Materials used in slate include wood, Concrete, slabs, wire-mesh/metal, Bamboo, where slab should be used, the space should be enough to allow manure to drop and small enough not allow the feet not to pass to spacing between the slab, in the few of the adult use 15mm as the young one use 10-12mm.

The floor can be cemented or rammed in designing the house, for sheep and goat floor space of 0.3-0.4m2 (30-40cm) can be provided per adult animals, for bigger breed or those with big horn 0.7m2 is recommended the wall should be 1.5m high or just half of a normal building. It could be made from cement blocks, mud, Bamboo stem, cereal stalks, whatever material is use, it should be able for provide protection, against predators, rain, excessive heat the housing should provide adequate ventilation, which have to removed heat, pollutant, the roof can be made from corrupted iron sheet, grass thatched (zana mat), the eave of the roof should be about 1.5m, and the ridge at 1.8m

**Management House**

The management is important for the production of the animal, the floor must be clean daily expect when wood shaving or straws are used as bedding, in this case the cleaning should once in every two weeks, the sprays of hot wood ash on the rammed floor it helps to control pathogen, particular eggs and larva of worms, rammed floor should be clean weekly in raining or wet season. Once in every week in dry season, fleas and mite are common in sheep and goat housing it therefore controls by fumigation of wall and floor at about 2 weeks interval. Facilities required at sheep and goat housing are animal are:

Fedder and drinkers, dipping pit, salt leak, handling face, shovel, weighing scale, the basic facilities of feeding and watering in goat and sheep housing are feeding and watering trough in intensive system of production there are runs for some excise , handling face for routine operation in the farm are required. this include catching individual sheep, isolation of sick one, dipping etc. feeding trough can be made up cement block, curved wood ,moulded block or longitudinal cut drum, in situation where longitudinal drum are used, the edge should be smoothing to prevent injury such feeder are adequate to concentrate supplement, For roughages racks should be used for feeding trough for minimizing wastage and contamination, for animal that do not work on hard surface may have their hooves over grown may required trimming. Drenching facilities include drenching gum, coca cola bottle

**Feeds and feeding principle**

Feed are substance voluntary eating by animals to provide nutrient such as energy ,protein and vitamin Metabolisable in body to produce and maintain the body tissue fluid and product e.g.milk and meat, most of feed are made up natural substance which are commonly of organic matter and little component of inorganic matter, the organic matter component consist of carbonhydrate , protein, lipid and vitamin ,inorganic matter ir made up mineral, feed stuff are classified base on their type of nutrient content,those that are high in nutrient density and easily digestable by ruminant animal are term concentrate those that are poorly digestible and lower in nutrient content are refer to as roughage both concentrate are roughage to provide protein and energy it is therefore noted that any feedstuff with crude protein content greater than or equal to 16% is classified as protein source while feed material with less than 16% is term as roughage, protein and energy feed contain some vitamin and mineral but may not be adequate to meet animal requirement supplementary vitamin and mineral are given and such mineral and vitamin are refer to as **Additive**.

**Carbohydrate: (CHO) :-** They are mainly sources of energy feed material, feed material that are sources of energy include hay, fodder, pasture, silage and grain these material when eating are normally broken down in rumen into Volatile Fatly Acid (VFA) these fatly acid consist of basically acetic acid (Acetate), butyric acid (Butyrate), propionic acid (propionate) when fibrous feed as feds to animal a high proportion of acetic acid is produce with corresponding low butyric acid, but when low digestible feed are fed to animal high butyric and propionic acid are form with low acetic acid the relative proportion of this acid in the rumen determine the effect in which the acid are utilizes for production e.g. for maintenance growth and production e.g. meat, milk. The total energy in feed is not your final target but the amount of energy they can be utilizes, this is known as **metabolisable** **energy** and it express in mega joules/kg/dry matter. For example if the energy density of gamba grass (hay) is 7mg/kg/Dm of metabolizable energy and for the purpose of calculation you should note that metabolizable energy of any feed depend on the digestibility of that feed material.

Digestibility = Feed (Dm) – faeces (Dm) x 100

Feed (Dm)

Test of Digestibility is done in lab-chemical (proximate) or Rumen degradation.

**Protein:** Are complex molecular that contain nitrogen (N2) animal required for protein are express in crude protein, generally protein in most of the time are available for small ruminant because of the feeding habit. They are also need for small amount of protein to supplement into the diet; the main sources of protein for small ruminant are nitrogenous compound found in large quantity in leaves and edible grasses, legumes and browses. Furthermore more than halp of the available protein come from microbial protein synthesis in the rumen this synthesis is all sufficient. If the microbes have adequate energy supply there bulk of ammonia which become toxic to the animal, as a guide therefore the minimum requirement for the maintenance is 8% in Dry matte, for rapidly growing animal lamb, kids and lactating ones, does or bucks 11%, for lactation and growing in dry matter this value for most part of the year lower than requirement are high than average value found in native pasture this courses, there is need for supplementation of protein, other source of protein for use are protein from animal sources in addition to plant sources example of animal origin, poultry by product e.g. blood meal or litter which condition 31% Cp other source of protein of plant origin are soybean cake, G/nut cake, other non-protein substance such as urea, ammonium nitrogen or ammonium salt, uric-acid are useful source for nitrogen for ruminant animal, they are used because of the availability of rumen microorganism to utilize them for their own cellular tissue, introduction of non-protein-nitrogen to small ruminant should be gradually and in small quantity over a time at least two weeks, for rumen microorganism to adjust, for small ruminant recommendated dosage for urea are supplement is 20g/head/day alternatively 1/3 of total nitrogen in the ration of 3% of the concentrate ration on the diet for fear of toxicity. Urea should be feed along readily fermentable source of energy such as starch, grain, urea should never be fed to lamb and kid where rumen is not fully developed.

**Precaution for Feeding Urea**

**Vitamin:** These are organic compound essential for normal growth and maintenance, they are relative very small quantity once the animal are grazed or have access to fresh green forage and grain, they normally acquire the basis for further synthesis in the rumen.

**Mineral:** Forages are the major sources of mineral but the content and below nutrient requirement, when feeding mineral are supplement to make up the content found in forage and grain, one should consider along the need for microbial activities, saliva produce and other metabolic activities, the mineral of economic important include copper, iron, cobalt zinc, selenium, moledium. This mineral is usually deficient in soil or when available in the soil or not available in the soil for plant uptake as such will not be available for animal to utilize.

**Feeding of Sheep and Goat**

Feeding of small ruminant is important for economic reason, for intensive and semi intensive feeding has to be schedule in accordance to productive function under this production function animal are categories in to five (5).

1. **Dry Ewe/does under 3 month of Pregnancy:** Ewes and does that are not pregnant or pregnant under 3 month are classified as dry animal these anima need to be feed just above maintenance requirement, as a guide the daily dry matter in take for sheep and goat vary from 1.5 to 3 % body weight depending of the quality of the feed. So it is common practice to flush the animal in breeding time. Flushing is to increase the level of nutrition shortly before mating, flushing help to stimulate the shedding of ovals and ovulation which increases the chance of twining.
2. **Feeding of female more than 3 months Pregnancy:** When the female goat/sheep mate, it is likely that sheep/goat are pregnant, the gestation period of sheep and goat is about 5 month and after 3 month is possible to fed foetus. To detect pregnancy rub your hand under side of ewe or does by gently palpating the abdomen, about 10 cm in front of the udder, furthermore watch out for considerable enlargement of the abdomen and udder as the pregnancy advancing, but with advancing in technology pregnancy and sex of foetus can be determine via the use of ultra-scanning. Feeding of animal at this physiological stage is very important since addition nutrient are required for the development of the foetus. While udder development as preparation for milk synthesis increases in order to attain the desirable level of feeding required animal must given 25-50% of their daily feed, required as their feed concentrate and 25-50% as high quality forage. Concentrate ration consist of 200-300gram of maize offal, sorghum offal, wheat and some dry deep litter (poultry waste). if it’s an oil seed cakes such as cotton seed cake, groundnut cake and soybean cake each will be supplemented with 100-200gram daily during the wet season and in the dry season give 300-500gram of cereal by product, sundry poultry litter or 200-500gram oil seed cake along with 0.5% salt and 0.5% bone meal.
3. **Lactating Animal and their Offspring:** Lactating animal will usually refused to eat large quality of solid feed for three to four weeks after birth, it therefore normal for lactating animal to lose weight as a result of decrease in feed and stress of nursing. Dams should fed high energy with an increase amount of protein feed for the maintenance and lactation requirement, during this period lamb and kids depend on milk, in the first week of the life, milk produce by the mother is important for the survival of the young once, young animal should receive colostrums during the first 18 hrs (up to 3 days) of their life. Colostrums is said to be digestive source or enzymes contain antibiotic and laxative which all protect the young one from disease, there are instancing which the mother is incapable of lactating the milk in such a situation the young one should fostered or artificial colostrums should formulated and given the artificial colostrums consist of 0.5 litre of fresh milk, castor oil 5ml, cod liver oil 125gram, broad spectrum antibiotic such mixture should be given twice a day, lamb and kids could also be bottle feeding and 3 day of age whole cow milk can fed to the lamb and kid in combination of 5ml of castor oil or 5ml cod liver, such mixture should be fed 3 time a day, the kid and lamb can be survive on diluted milk for first four weeks of age, from four week the young one start to nibble on the solid concentrate. The consumption will not be appreciate until eight week of age, good diary ewe or does produce about 1 kg of milk daily for the first 3 month of lactation and outstanding dam can give 2-3 kg daily while the non-dairy type given 0.5 litre per day however milk production increase in parity and decline when maximum voluntary intake is achieved, the requirement for lactating sheep and goat increase and should therefore be double relative to weight of dry animal on the other hand animal should be fed 6 to 8% of their body weight and the fed should comprise up 40% concentrate and 60% roughage, it is recommended to keep newly lamb or kidded ewes or does in individual pen for the first 2 days then in small group for two week where enough space is available. It is better to have separate pen for singles, twin, and triplet separately.
4. **Feeding the Weaners:** Lamb and kids should be wean at 16 kg of weight, in any case where the use of weight is not practice by most native farmer, however by three month of age weaning should be done by separately the young one by their dams, gradually weaned animal should be fed good quality hay and concentrate ration containing all the nutrient required by growth and development. The crude protein content of the diet should 16% and introduced gradually.

**Feeding of Breeding Flock:** This group of animal should be fed ration good energy to maintain their body ration feed.

**The Cow-calf System:** The cow-calf system refer to the breeding of cow and rising of calf (production factory) in this system to calve runs with their dam usually on pasture until are weaned and the cow are not milked. The important of the cow-calf system (production factory) in animal agricultural are:-

* Production is cheaply and conversion of coarse forages and grasses into palatable and nutritious food for human composition.
* The production of calve is the first and most important target of the cow-calf system

The cow-calf operator has several option, he may choose to:

1. A mixed farming or a range herd
2. Running a commercial or pure bred cattle
3. Selling weaner for stocker
4. Dual purpose production

**Dual Purpose Production:** For the most of part nation dual purpose production is normally confined to the small farmer who lives upon the land. In this type of production an attention is made to obtain simultaneously as much beef and milk is possible. One of the important of dual purpose production is the flexibility which it affords. When labour is available and dairy product is high in price the herd may be mange for milk production, on the other hand when labour is scarce and dairy product is low in price calve may be left with their dam and emphasize may be place for beef production, basically when established of caw-calf system, a farmer and rancher need to give consideration to the availability of the fallowing resources, Land, labour, capital and management skill. The most successful cattle man would put these together as to maximize profit, followed by increase cow number.

**Cattle Management**

Cattle management practices vary widely between areas and individual farmer and rancher, however the principle of good management of farmer, ranch herd, pure breed, and commercial calf are much alike.

Some simple cattle management practices are as follow:-

1. **Identification**: All cows should be identified as soon as after birth not later than three days of age, a combination of flexible ear tags and tattoo number is recommended thereby ensuring both ease of reading and performance.
2. **Dehorning**: Dehorning is necessary because horned calves usually bring low price, in addition dehorned and naturally polled animal do less damage to facilities and other animal than cattle that has horn. All naturally horn animal should be dehorn preparable before they are 2 mouth old in order to maximize the effect of the operation (trauma), at that time the blood vessels in the horn are very small, which minimize blood looses and shock, dehorn may be accompany by one of the following:-

a. Mechanical i.e. cutting with a dehorner

1. Electrical .i.e. electrical heated iron
2. Chemical i.e. liquid paste apply on horn
3. **Castration:** Castration is recommended for all bull cow intends to be sold as feeder or finisher in feedlot. Castration time will vary according to method employed and management programme and it will be different for a commercial than for a pure breed operation. Some cattlemen use elastrator bands, when calve are only few day old other use knife or Burddizzo (clamp) when the calf are 4 - 5 month old. It is important to wait until weaning time to castrate. Bull calf will weigh more at weaning than steer calve, however younger are easily to restrain for castration and suffer less shock.
4. **Weaning:** Cow should be wean when they are 7 - 8month old, weaning early than this may be necessary in season when pasture are short or when calf are first calf heifer , the best way to wean is to remove the calf’s from their dams and kept them in separate site, the cow and calves should never turned together (put together) once the separation has been made such a practices will only prolong the weaning process and it may cause digestive disorder in the calf. Provide feed with plenty of water at the time of wean, free choice hay and some grain per day during the weaning process. Calves should be confining to small area to cut down on walking and shrinkage. In bad weather, they should have access to a shed to protect them from cold, wind and rain,.

When dealing with high of milking breed (strain) Cattle men will have the same concern as dairy men, to avoid spoiled udder the following procedure is recommended.

1. Does not fed milk stimulated feed at weaning; put the cow on poor pasture, fed non-legume forage.
2. Let “bag pressure” in the udder build up, examine the udder at interval but do not milk it out. If the bag full up and get tight, rub an oil preparation (such as camphorated oil or a mixed lard and spirit of camphor).

**Feeding Principles of Cattles:** The feed consumed use for a number of different purpose the exact usage varying somewhat with class, age, and productivity of the animal, a certain part of the feed is use for the maintenance of the body function aside from any useful production this is known as **maintenance requirement** in addition various classes of animal use feed to take care of the function for which they kept; the young animal need nutrients suitable for building muscle tissue, bones ,finishing animal need a surplus of energy feed for the formation of fat, breeding animal (female) required feed for the development of their foetuses and prepare for parturition, for the production of milk, where as work (draft animal) use feed to supply energy for work, other classes required feed for production or egg and wools.

1. **Maintenance Requirement:** It may be defined as a ration which is adequate to prevent a loss of tissue in the body, a mature animal must eat to maintain body temperature, sufficient energy to cover the internal work of the body and the minimum movement of the animal, small amount of protein, vitamin, and mineral for the repair of the body tissue. No matter how quietly the animal is, it still required a certain amount of feed which it can exist it called basal **maintenance requirements** for economic reason finishing animal (fattening) should eat and lay down as much as possible even under the best condition about ½ of the all the feed consumer is use in meeting the maintenance required.
2. **Growth:** Growth may be defined as a increase in size of the muscles, bones, internal organ and the other part of the body, growth refer to as foundation of animal production, young animal will not make the most economical finishing unless they have raise vigorously, likewise breeding female may have their productive ability seriously impaired, if they have raised improperly. No one can expect the most satisfactory yield of milk from dairy cow unless they were well develop. The horses do not posses desire speed and endurance if their growth have been stunted and their skeletal is not well develop.
3. **Finishing (Fattening):** This is the laying of fat especially in the tissue of abdominal cavity and in the connecting joint just under the skin and between muscles. The composition of the ration for finishing may be the same as for maintenance, but it must be supply in large quantity. In practical sense finishing animal is usually obtained through increasing the allowance of feed high in carbohydrate and fat, also allowance of grain and surplus of protein may also serve for the production of fat but usually such feed is more expensive and are not use for economic reason, in fattening matured animal very little, or more protein, vitamin and mineral are required than for maintenance. In young growing animal it is essential that, in addition to supply more carbohydrate and fat, ample protein, mineral and vitamin be provide. In general the more feed a growing finishing consumer, the more weight it gains.
4. **Reproduction and Lactation:** Regular and normal reproduction is the basis for profit of a farmer or rancher, certainly there are may cause of reproduction failure, many scientist are agreed that inadequate nutrition is the major problem with all species, the growth of foetus occurs during last third of pregnancy, thus making the reproduction required most critical, during this period the ration of the pregnant female should supply sufficient amount of carbohydrate, vitamin and mineral. In the case of young growing pregnant female additional protein, mineral and vitamin above the ordinary requirement most to be provided.

**Housing and Equipment in Cattle**

The farm or ranch are different in type and size, so buildings will vary accordingly among the factor to be consider in building cattle housing are:-

1. Size of the farm
2. Available market
3. Types of production e.g. beef or dairy
4. Personal preference
5. Climatic condition
6. Storage requirement

There is general requirement of animal building, these most be consider during establishment, it is important that very careful consideration to be given for the initial design, the general requisite which livestock building should meet are:-

1. Flexible design
2. Reduce labour
3. Have utility value
4. Provide protection from weather condition
5. Durability
6. Well ventilated
7. Provide direct sunlight
8. Easily to clean and manure disposal
9. Provide adequate space
10. Source of water
11. Keep proper humidity
12. Adopted to present and future need

**Space requirement of Building and Requirement**

One of the most difficult problem confronting a farmer or Rancher in constructing a housing is that how to arrive at proper size or dimension. In general little space will result in poor health and well being of the animal, where as more space is good but it is more expensive. Building for housing cattle should include, forcing pen, veterinary crushes, feed stall, holding yard, crouch, young stock shed, calve and cow shed, exercise shed and sick bay, a dip and crouch are essential on a cattle farm.

**Livestock Equipments:** Modern equipment has practically eliminated pitch cork, bucket and basket. Equipments such as chores and watering, bedding and barn cleaning have been or are being mechanised. But in using the local equipments regardless of the kind of equipment or size this must be consider:

1. Simple in construction
2. Durable
3. Movable
4. Accessible
5. Save feed
6. Reduce labour
7. provide protection

**Health Management of Ruminants:**

A good stock man will institute a programme design to a sure herd health, disease prevention, and parasite control, when there is a disease problem do not attain to diagnosed but call upon a vetenarian. A good producer will be in a better position to institute a programme design to:

1. Assure Health.
2. Readily recognised a serious outbreak of disease and promptly call a vetenarian.
3. Prevent a necessary suffers of sick animals.
4. Would be able to assist the vetarenian in administering drugs.
5. More competent in carrying out a programme designed to control disease which minimum spread of the infection.

**Sign of Good Health**

Knowing sign of ill and sign of good health is important in order to known when disease struck your herd these should consider:

1. **Contentment:** The cow will stretch on rising, the sheep will stand or lay quietly, the pig will curl his tail and horse will look completely unworried when resting.
2. **Alertness:** Healthy animal are alert, have bright eye and would pick their ears up.
3. **Eating:** which relish and cuddling (rumination) by ruminant (cattle, sheep and goat) is assure sign of good health and is one of the first thing to disappear in sickness.
4. **Good Coat Scoring:** A healthy animal has good skin condition.
5. **Bright Eyes and Pink Membrane:** In healthy animal eyes are bright, when lower lip bent down is whitish pink in colour and moist.
6. **Normal Faeces and Urine:** The consistency of the faeces varies which diet for instance when animal are first turned to lush-grass, the faeces will be loose, also the consistency and dryness of the faeces vary with species, the faeces and urine should be pass without effort and should be free from blood, mucus and pus.
7. **Normal Temperature:** pulse rate and breathing rate, in general any mark and persistence to deviate from the normal pulse rate and breathing rate, the farm animal may be suspect of sign of abnormal.

**Animal Disease:** In general disease is defined as any departure from state of health; beyond doubt most serious problem threatening the livestock industries is animal disease.

**Cause of Disease:** Any agent that causes or brings about an abnormal condition to the any tissue or body is called diseases producing entity. Among the chief causes may be infection agent such as Bacteria, viruses, fungi, parasite and non infection agent such as chemical, poison of various types, poor nutrition and injury, in addition to the actual caustic agent any of the following condition my predispose to disease, over work, expose to cold.

**Parasite:** broadly speaking parasite are organic living which attached to the animal as host ,there is wide variety of internal and external parasite, they include fungi, protozoa, (unicellular) and arthropod (insect, tick) and helminth (worm) many diseases cannot be spreads unless are carry by insect, some parasite requires only one host while other required more. They seriously affect the host. Among the way in which the parasite may do harm are:

* Absorbing nutrient
* Sucking blood
* Feeding on the tissue of the animal
* Causing irritation
* Transmitting diseases,

This may result in death of the affected animal or may cause large financial lose through stunted growth, low production, general unthriftiness and emaciation. Prevention and control of parasite is one of the cheapest and most dependable method for increase production.

**Poisonous Plant:** There is number of poisonous plant, but it is impossible for the stockman to know them all, but have a working knowledge of losses from poisonous plant is important, the emphasis should be on prevention rather than control, the following are effective preventive measure:

* Fallow good pasture or grazing reserve or range.
* Known the symptom that is generally indicate plant poisoning.
* Avoiding turning animal in the pasture in the beginning of rain.
* Provide supplementary feed during drought.
* Avoid turning hungry animal where there is poisonous plant.
* Remove promptly all animal from infested area where poisonous strike.

**Mode of Spreading Diseases:**

Disease may be spread from one animal to another in a different ways.

1. **Direct Contact:** Direct contact with diseases animal in which the infected host actually touches.
2. **Indirect contact such as:**

a. Susceptible animal touching infected animal excretion or secretion or avoided foetuses.

b. Susceptible animal breathing infected droplet from the nose and mouth of the infected animal.

1. **Contaminated facilities:** such as vehicle transported the animal, Syringe, feeders, winterers.
2. **Vectors:** which include insect, mites, ticks, snail.