

SHEEP PRODUCTION

Sheep was first domesticated in the new stone age. Evidence for the domestication of sheep dates to 9000 BC in Iraq. DNA analysis has shown that domestic sheep are descended from two ancestor species, one of which is the mouflon. The mouflons comprise *O. musion* and *O. orientalis*. Although the second ancestor has not been identified, both the urial and argali have been ruled out. The urial (*O. vignei*) is found from northeastern Iran to northwestern India. It has a higher number of chromosomes (58) than domestic sheep (54) which makes it an unlikely ancestor of the latter, but it interbreeds with the mouflon. The argali sheep (*O. ammon*) of inner Asia (Tibet, Himalayas, Altay Mountains, Tien-Shan and Pamir) has 56 chromosomes and the Siberian snow sheep (*Ovis nivicola*) has 52 chromosomes. This Soay ram demonstrates the wide variance in sheep traits that belies the prototypical appearance of the animal. Historical records show that sheep provided primitive pastoral people with meat, wool, tallow, skin and milk.

Sheep Terminologies

Sheep: the entire Ovine species

Lambing is the act of giving birth to lambs in sheep

Lamb is sexually immature sheep of any sex

Ewe female sheep after reaching sexual maturity or after producing an offspring

Flock is a group of sheep kept together

Mutton is meat from mature sheep used as food

Fleece another word for wool from sheep. It is used for clothing

Ram: adult male sheep

Docking: cutting of lamb's tail to keep the animal clean

Shearing: process of clipping wool from sheep

Economic importance of sheep

The economic importance of sheep in developing nation cannot be over-emphasized. Sheep with their small body size, high productive capacity and rapid growth rates are ideally suited to production by resource-poor smallholders. In sub-saharan Africa, sheep provide almost 30% of the meat consumed and around 16% of the milk produced. Sheep contributes about 50% of the total domestically produced meat in Nigeria. Nigeria possesses about 22.1 million sheep. They thrive in a wide variety of environments in the tropics and sub-tropics. It requires less capital as they can be completely maintained on pastures, browse, and agricultural waste products. A flock of sheep can provide families with food each day in the

form of milk but only in limited parts of the world are sheep milked for dairy food. Countries in Southern and Eastern Europe and some developing countries such as Syria and Turkey consume fresh sheep milk in reasonable quantities . Sheep milk is an excellent raw material for the milk processing industry especially in cheese production. Genotype, animal's feed, health, weather conditions, the number of lambs, milking technique, the botanical composition of the pastures and other factors have a great influence on sheep milk. The Mediterranean countries are the biggest producers of sheep milk. They participate with approximately 47% in the overall world production of sheep milk. Sheep milk yields 18 to 25 percent cheese, whereas goat and cow milk only yield 9 to 10 percent. While sheep usually produce less milk than goats and much less than cows, sheep milk sells for a significantly higher price per pound, almost four times the price of cow milk. Large consumption of sheep milk is thought to lead to longevity. Bulgarian shepherds are noted for their exceptionally long lives, presumably from a diet of the produce of their sheep. Because of its high calcium content, sheep milk is also very good for the prevention of osteoporosis and for those people already suffering from it. Sheep milk is the most nutritious milk on sale in the world today. The only other milk that can be compared with it would be that of the camel and the water buffalo.

Breeds of Sheep in the World

A breed is a collection of individual within a species which share a certain number of morphological and physiological characters which are passed onto their progeny as long as they breed among themselves. There are many breeds of sheep, but these are generally subclassable as wool class, hair class meat class and dairy class variety breeds. Dual-purpose breeds are bred for both wool and meat. Major wool breeds include Merino, Rambouillet, Romney, Shetland, and Lincoln. Drysdale and Herdwick are bred specifically for carpet wool. Breeds of meat sheep include Beltex, Suffolk, Portland, Hampshire, Columbia, Texel, and Montadale. Breeders of dual-purpose wool class sheep concentrate on fast growth, multiple births, ease of lambing and hardiness. An easy-care sheep is the Coopworth that has long wool and good lamb meat production qualities. Other dual-use breeds are the Corriedale and Shropshire. Sometimes, sheep are used for both purposes equally and cross-breeding is practiced to maximise both outputs. For example, Merino ewes providing wool may be crossed with Suffolk rams to produce lambs which are robust and suitable for the meat market.

Hair class sheep are the original class of sheep in the world, developed for meat and leather. They are prolific and highly resistant to disease and parasites. Dorpers and Kahtahdins are composite breeds of wool and hair crosses with different degrees of wool/hair mixes within the hair class. True hair sheep such as St. Croix, Barbados Blackbelly, Mouflon, Santa Inez and Royal White shed their protective down fibre to an all hair coat in the Spring/Summer. Hair class sheep are becoming more popular for their no-shear aspects.

Although, milk is no longer a major product of the sheep in many developed countries, such as North America and Australia, its importance has been maintained in other parts of the world including some European countries. The world's known sheep dairy breeds include the following: the Fries Melkschaap, Lacaune, Chios and Awassi sheep.

Breeds of Sheep in Nigeria

The Nigerian breeds are mainly the hairy type and there are four breeds : the West African Dwarf, Yankasa, Uda and Balami. However, other breeds which are of less importance exist which include the Bororo and the Ara-Ara found in Niger and Anambra States (RIM, 1989). In a survey by RIM (1989), these two breeds were described.

West African Dwarf

Also Known By: Cameroons Dwarf, Djallonké, Forest-type, Fouta Djallon, Futa Jallon, Guinean, Kirdi, Kirdimi, Lakka, Nigerian Dwarf, Pagan, Savannah-type, Southern, West African Maned

The West African Dwarf is the predominant breed of the humid tropics from southern west Africa through central Africa. The West African Dwarf is small bodied, compact breed which may be all white, black, brown or spotted black or brown on a white coat. Its variation in colour and patchy distribution make it difficult to distinguish it clearly from the Yankasa. Adult males weight approximately 37 kg. They have a well-developed throat ruff and are horned. Ewes have mature weights of 25 kg. The females are usually polled. They can be bred at the age of 7 to 8 months. They tend to have a short lambing interval. The prolificacy of adult ewes is low to moderate ranging from 1.15 to 1.50 lambs per lambing. At less than 100 g per day under good feed conditions, their growth rate is low and lamb mortality is high. This breed is also trypanotolerant.

Yankasa

Also Known By: *Hausa, White Fulani, Yankasa*

The Yankasa is a meat breed found in north and north central [Nigeria](#). The Yankasa is a medium-sized breed of sheep. The tail is long and thin, the ears moderately long and somewhat droopy. Rams have curved horns and a hairy white mane and ewes are polled. They have white coat colour with black patches around the eyes, ears and muzzle. Yankasa rams stand 70 to 80 cm at the withers and weigh 55 to 60kg at maturity. Mature females could weigh 25 to 40kg while male weighs between 35 and 50kg. The milk yield (kg) per lactation is between 30 and 56kg and has a lactation length of 91 days. The peak milk yield per day is 960 grammes.

Uda

Also Known By: *Oudah bicolore (French), Bali-Bali, Bororo, Fellata, Foulbe, Houda, Louda, North Nigerian Fulani, Ouda, Pied*

The Uda is found in northern Nigeria, southern Niger, central Chad, northern Cameroon and western Sudan, the Uda is one of the hair sheep breeds of the [Sahel type](#). It is a meat breed. It is a long-legged breed of sheep with distinctive coat colour of brown or black anterior and white posterior. They are large with straight and long face. The rams of the Uda are horned and the ewes are usually polled. The Uda is slightly smaller bodied than the Balami, although their size ranges overlap. The weight of mature females could be 30 to 40kg while mature rams weigh 30 to 60kg . Milk yield per lactation lies between 32 and 36kg for an average lactation length of 91 days.

Balami

Balami is the largest bodied native sheep in Nigeria. As a pastoral animal, it is confined to the semi arid north but it is favoured as a stall fed breed by muslims throughout the Nigerian middle belt. It is white and hairy with pendulous ears, long-leg and a long thin tail. Rams are horned but ewes are normally polled. Another feature that makes the Balami distinctly recognisable is its Roman, bulbous nose that distinguishes it from the Yankasa. It has good potential as a meat producer. The weight of mature males ranges from 40 to 80kg while that of female lies between 30 and 40kg. The milk yield per lactation lies between 28 and 33kg in 70days

The Bororo

The Bororo is a large-long legged breed of sheep said to have originated from Chad. It has white posterior and pendulous white ears. Mature weight is between 45 and 55kg

The Ara-Ara

The Ara-ara also known as Tuareg has its origin from Nigeria and is predominantly white or fawn. The rams of the sheep breeds have horns but polled strains could be existing as had been found with the West African Dwarf sheep

Management Systems in Nigeria.

A number of sheep management systems have been described in Nigeria. These management systems range from free range to tethering in subsistence production to confinement in semi-intensive and intensive systems.

Extensive or Traditional system

In Nigeria, the system of husbandry is mainly traditional with individuals keeping 2 to 4 animals on which investment is minimal but potential returns are still high. These systems of husbandry are characterized by trekking and exposure to high ambient temperatures. Animals lose body weight while moving. The traditional system of management is characterized by high incidence of diseases and parasitism, together with the adverse effects of tropical climate. Other characteristics include losses to stealing, motor accidents, poisoning by crop farmers and conflicts between livestock owners and crop farmers, losses to predators, indiscriminate mating.

Semi-intensive system

The semi-intensive management system is intermediate between the intensive and the traditional management system. The system involves grazing of the animals on any available herbage during the day and housing them during the night. On the other hand, the sheep is still fed in the morning and in the evening. Animals were observed for disease problem and veterinary care was provided.

Intensive system

The intensive system would involve complete confinement of the animals either in pastures or in pens where feed and water are provided. Here, crop residues such as rice straw

and bran, cassava peels, brewers dry grain are provided. Improved nutrition could be achieved through the use of cut – and – carry grasses, legumes or browse supplemented with salt licks. Under this situation, adequate nutrition is ensured and the welfare of the animals is constantly monitored with full veterinary care being provided. The greatest advantages of this system are effective conversion of crop residues or supplement to products of high biological value such as milk and meat. There is control of reproduction, improved performance and hygienic conditions, collection and use of faecal materials as farm yard manures, reduction in cases of parasitic diseases, control of sheep against auto-knock downs and little or no damage to the environment.

Factors favourable to sheep production

As compared to other classes of livestock, sheep possesses the following natural advantages

1. They are particularly good in the utilization of more arid type of grazing
2. They are good at utilizing wasteland and are also excellent scavengers, gleaning fields and destroying weeds
3. Compared to cattle, they produce more liberally in proportion to what they consume
4. Some breeds, e.g. the wool type produce two products- wool and lamb available for market at two different periods of the year
5. Their returns come quickly, lambs may be marketed 8 months after the ewes are bred.
6. Sheep droppings are particularly less subjected to wastes because of the way they are dropped and tramped into the soil.

Factors unfavourable to sheep production

1. Sheep are subject to attack by predators, including dogs
2. They are less resistant to diseases or injuries
3. Sheep are susceptible to a number of parasites e.g worms
4. For the wool breeds, in the international market have always been politicized, and moreover synthetic fibres is in stiff competition with the wool

Starting Sheep Raising

In starting any livestock enterprise, certain factors such as land, breed of stock and infra-structural facilities and their cost need be adequately considered.

1. Land: Under extensive grazing conditions, land requirement is 1.6-4.0ha per 100 sheep. However, under intensive management, a well established pasture of 1 ha would support 26-40 sheep.
2. Breed: Advisable to use breeds adaptable to the ecological zones where the enterprise is to be set e.g. for this zone use the West African Dwarf or the Yankasa.
3. Infrastructure: An office accommodation for a large enterprise, adequate fencing because of their size require chain link fencing or close fencing. Chain links are at present very costly, so wood posts plus wire but designed to be close will be adequate.
4. The foundation stock: Foundation stock for starting sheep rearing enterprise should be purchased from reputable sheep breeding farms or government farms such as the LIBCs. This would ensure purity, high genetic quality and freedom from disease. Unfortunately, however, the number of available breeding farms are limited. The open market therefore becomes the place of choice for the purchase of breeding stock. In purchasing animals from the open market, attention must be given to the animals health, age and physical appearance.
5. Health: All ewes selected must be in a thrifty, vigorous condition. They should have every appearance of a life of usefulness ahead of them and give every evidence of raising strong healthy lambs. Such animals should be free of catarrh, diarrhea and skin diseases. Also, ensure that animals are free of ectoparasites such as ticks and fleas.
6. Age: It is advisable to buy sheep 1 1/2-3 years old. The age of sheep could be determined using their teeth. The lamb has narrow teeth known as milk teeth. At 12-14 months, the 2 center incisors are replaced by two large, broad, permanent teeth while those 3 years have permanent teeth. At 2-2 1/2 years, they have 4 permanent teeth while those 3 years have 6 permanent teeth and at above 4 years, they have 8 permanent teeth.
7. Physical appearance: Animal with physical defects such as lameness, blindness and malformed toes should be avoided. Lean and stunted animals should be avoided. Purchased animals should be fine looking, active, have bright eyes and

fine (rather than scruffy and rough) coats. It is advisable to buy in small batches from as many genetic variability as possible.

Initial Health Precaution: It is good husbandry practice to quarantine newly purchased animals for 1 month before introduction to the herd. Recommended treatment required during the 1 month period are as follows:

Day 1: Give prophylactic antibiotic treatment for 3 days

Day 4: Give broad-spectrum anthelmintics and coccidiostat treatments. Coccidiostats should be given for 7 days

Day 7: Spray for ticks

Day 28: Repeat anthelmintics and spray against ticks. Trim overgrown hooves

Day 30: Animals can join the main herd

In the humid zones of Southern Nigeria where PPR (Pestes des Petit Ruminants or Kata-a viral disease of sheep and goats) may be a problem, vaccination against this disease using PPR antiserum on day 1. And on day 10, Tissue Culture vaccine (TCRV) vaccine should be given subacute in the neck region above the shoulder. Always consult the veterinary doctor for your vaccination programme.

Breeding and Reproduction

Like in cattle, there are two types of breeders, commercial and purebred breeders. Commercial breeders specialize on securing high percentage of crops. They use purebred rams. On the other hand, the purebred breeders specialize on production of purebred rams for sale to commercial breeders and the other breeder as foundation stock. There are no commercial or purebred breeders in this country. Most animals are still from the village productions that have no special objective except for meat production. It is good practice to separate ram from ewe lambs after weaning. This will prevent indiscriminate mating or breeding and facilitate breeding during specific times of the year.

Age at puberty

Sheep attain puberty at 5-6 months, sexual organ of rams are already functional at this time. However, rams should not be used before age 1 1/2 years while ewe lamb could be bred at 9-12 months. It is good practice to replace breeding rams

with newly selected ones after each breeding season. A minimum of 6 rams should be in a flock of 100 ewes. Feeding of breeding rams should be improved 6 weeks before the breeding season.

Estrous cycle

The estrous cycle in the ewe is 16-17 days with estrous duration being 20-42 hours i.e. approximate 1-2 days average being 30 hours. Ovulation occurs in the ewe from about 24-30 hours after the onset of estrous after 16-17 days. There are no visible signs of heat in the sheep except the acceptance of the ram or teaser with an apron. This is the only external detection of heat in ewes. In flock mating, rams should be left in flock for 6-8 weeks to ensure (3 estrous cycles) that all ewes are bred. After that, they are withdrawn.

Rams should be joined with ewes 2 weeks after lambing. The ewes will still be nursing their lambs at this stage, but this does not prevent them from getting pregnant. Batch lambing could be ensured by synchronization using progestogen vaginal sponges. Ewes lambing within 2-3 weeks interval would be synchronized. This consists of inserting the progestogen in-plants into their vaginal for 12 days. Introduction of rams to treated flock 2 days before sponge removal would enhance ovulation. Mating does not begin until sponge removal. Estrous normally spread over 4 days following sponge removal. Non-pregnant ewes would return to estrous 16-21 days following sponge removal. Gestation period in ewes is about 5 months i.e. 152 days. Repeat breeder ewes, those weaning poor weight lambs and old ewes above 7 years should be culled.

Nutrition and Pregnancy

Nutrition exerts some influence on the reproductive performance of the sheep. The practice of flushing ewes i.e. feeding these ewes more generously 2-3 weeks before breeding would improve lamb crop by 15-30% and make rebreeding easier. Flushing could be accomplished by feeding concentrate or providing lush pasture or range. Steaming is done to pregnant ewes 6-8 weeks to parturition or prior to lambing to increase parturition rate and lactogenesis or milk production. Fat ewes are conditioned by exercise.

Undernourishment during late pregnancy may cause pregnancy toxemia (a metabolic disease), low birth weight and poor lamb survival. Undernourishment

during lactation and rebreeding may result in depressed lactation, delay estrous, lower ovulation rate and poor fertility. Survival rates, weaning weights of lambs of undernourished ewes are poor. Good nutrition and management ensures about 80% lambing rates of bred ewes with 25% twinning rate.

Identification

Identification of individual animal facilitates management and breeding operations such as record keeping, selection of replacement stock and culling of unproductive animals. Metal or plastic tags are available for identification purpose. Wooden tags with number painted on them could be hung on the neck of the animals.

Feeding

Roughages is the natural food for ruminants and the cheapest food for sheep. Roughages could be derived from rangelands, fallow land, sown pasture or crop residues. For intensive sheep production, pasture establishment is a good investment. Well established, well-managed pastures will support 25-40 sheep per ha during the rainy season or 5-10 during the dry season. Sheep should be allowed 6 hours grazing a day or be offered 1.5-2.5kg of good quality hay. Animals should be supplemented with 0.2-0.5kg of concentrate daily. Concentrate feeds are now sold in 25kg by millers all over the country.

Water

Sheep require 2-6 litres of water per day. This will vary with the age, physiological status, type of feed and ambient temperature. Both water and mineral salt licks should always be available to the animals.

Housing and other facilities

Housing is important requirement for intensive sheep production. Housing is essential for overnight shelter and provides security against predators for the sheep. Also, it provides protection against rain and cold. Provision of housing leads to overall improvement in the performance of the animals. Sheep housing can vary from a low mud-wall building with thatched roof, to a brick or concrete wall with corrugated iron sheets roofing. Also, corrugated iron walled building could be used. Such housing should be located on a well-drained soil. It should be well

ventilated to avoid dampness. The floor can be of cement or rammed earth; it should be easy to clean and should be covered with good bedding material such as straw or wood shavings which can be changed from time to time.

Handling sheep

Handling in sheep management could simply be defined as a way in which the husbandman drag, push or carry the animal to where they will be fed, administered drug for research purpose, for observation and study of their behavior. Good handling of small ruminant will prevent the animal from being injured and guarantee the safety of the handler. If sheep are to be caught and handled for any reason, they should be confined to a small corral or shed

Appropriate way to handle sheep are

1. Husbandman or attendant must know how to relate with the animal since animal communicate in one way or the other e.g. if a ram use its leg to scratch the ground continuously, it simply means it is ready to attack anybody
2. Sheep may best be caught around the neck, by the hindleg, or by the rear flank. They should be carried by allowing the hindleg to fold towards the front while using the other hand to hold the remaining leg. Never should they be caught by the wool.
3. The young animal should be carried close to the chest depending on the age, weight and body conformation.

Generally, what matter most is the good relationship with the animals as this will facilitate good handling.

Management practices

Sheep are gregarious, that is, they prefer to cluster together. The tendency of these animals to cluster together facilitates their management and makes it easy to discover any abnormalities in the flock, sick animals often withdraw or lag behind. For better performance of sheep, the following management practices should be undertaken:

Castration: Castration can be defined as the careful removal of the testes in the male animal. Ram lambs not needed for breeding should be castrated at one or two months of age. The purpose of this is to make the animal grow fatty and be more useful and more economically acceptable. Ram lambs are castrated to stimulate growth and improve meat quality. Castration should be performed by an experienced breeder, husbandman or a livestock farmer. Emasculator, burdizzo and elastor band are equipment used for castration.

Dehorning or Disbudding: This is the removal of horn. The essence of this is to give the animal fitness, reduce the incidence of injury, allow more animals be kept in a space and to allow the animal to grow. The procedure involves destroying the area of epidermal growth after one or two days after birth with caustic paste. Surgical removal involves the use of scoop. This equipment is used to clip the area after disinfecting. If caustic paste (sodium hydroxide or NaOH) or caustic paste is used, then the ram lamb should be restricted for half an hour so that it does not rub the caustic paste off. Fully grown horns can be removed by clipping them from young animals or by sawing them in mature animals, in both cases local anaesthesia is applied.

Deworming: Deworming is the process of removing worms from the internal environment of the animals using chemicals. Some of these worms include flukeworm, hookworm, roundworms, pinworms, tapeworms and so on. Chemicals used for deworming often referred to as dewormer include thiabendazole, banmith, phenothiazine, febendazole, coopane, piperazine, flukazole. Deworming can be done through drenching. Deworming should be periodically (usually four times in a year) to eliminate worm infestation. Good hygiene and cleanliness should be maintained on the farm in order to prevent worm infestation. Rotational grazing must also be practiced.

Spraying: insects, ticks, mites and lice are all ectoparasites since they live on the the outside of the bodies of the animals. These parasites can cause direct harm like the blood sucking insects and ticks which may or may not transmit diseases . Biting flies like tabanid can make the animals restless and prevent them from grazing properly. Mites and lice causes extreme irritation in sheep and leads to losses of hides and skin in sheep while common housefly is a carrier of a number of bacterial infection including anthrax. Tick causes a number of diseases which are of economic importance in West Africa. These include red or heart water disease (babesiosis), gale sickness (anaplsmosis), spirochaetosis. Ticks may also transmit mechanically the disease known as Kirchi (skin streptothricosis).

Spraying should be done to eliminate these pests. This is done by spraying the animal with insecticidal chemicals or by forcing animal to pass through a pool of water to which some chemicals have been added. There is also topical application of this chemical to the back of the animals. This operation should be carried out fortnightly in the rainy season and monthly in the dry season. Some of these chemicals include vetox 55, toxaphane, bayticool, asuntol,

lindane. Ivomec, an injectable chemical can be used to cure both ectoparasite and endoparasite at the same time.

Vaccination: Vaccination is the process of administering vaccines in order to prevent the occurrence of diseases or protect the animal from contracting serious infectious disease. Diseases that are contagious and deadly are usually vaccinated against in order to prevent the outbreak of disease which can wipe out a whole flock or herd. Examples of such diseases are anthrax, foot and mouth disease, pox, tuberculosis, blue tongue, clostridial disease, rabies, rift valley.

Below are some diseases and the age at which they could be vaccinated

Diseases	Age to be vaccinated
Foot and mouth disease	(a) At 4 weeks old (b) Then every 6 months (c) When outbreak occurs (d) At weaning
Pox	(a) At 5 weeks old (b) Then every 3 years
Anthrax	(a) At weaning
Clostridial disease	(a) Lambs born of vaccinated ewes at 4 months (b) Every 6 months

Hoof trimming: Hooves should be worn down to a reasonable level. This is done by using hoof pick or sharp knife. On softer pastures or in zero grazing system, hooves grow too long and feet can be damaged causing thrush, an infection easily detected by its unpleasant smell. Every few months, the hooves should be inspected and trimmed with a sharp knife. A disinfectant should be applied where infection occurs or if the trimming results in an injury.

Routine Health Management

Flocks health management is very important in intensive sheep production system if mortality is to be kept reasonably low. Seek the advice of a veterinary doctor in planning flock health management. The following precautions should be taken for proper health management

1. Maintain good sanitation in pens
2. Control internal and external parasites by regular deworming, spraying for ticks and other ectoparasites
3. Close observation at all times would allow early detection of sick animals.
4. Isolate sick animals and seek prompt veterinary assistance for diagnosis and treatment
5. Keep proper health records and have dead animals autopsied

6. Quarantine newly purchased animals for 30 days
7. Provide salt licks and clean water liberally
8. Ensure adequate and balanced nutrition
9. Where pasture is established, rotational grazing is enforced to prevent parasitic build-up pastures and enhance good nutrition
10. Trim hooves and horns when necessary

Feed-lot fattening of rams

Intensive sheep production offers a major attraction for feedlot large-scale production of rams especially for sale during festivals when they are sold very high prices. Before going into the business, there is the need for careful consideration and planning if the venture is not to fail. Important points to consider include (a) source of rams health care, housing, feeding and the market.

Source of rams

Rams could either come from farm flock or from open market. It is advisable to purchase at times of low prices. Time the buying period precisely to allow fattening for 3-4 months. Remember your selection rules when buying. Essentially festival rams should be free from any deformities and should have well grown horns, it should be 1-4 years old. A well grown, large rams are specially attractive during festival periods. Avoid very young or very old animals.

Remember to quarantine and the routine management rules. Feed supplies and feeding practice exert some considerable influence on weight gains and consequently the profit margins. It is therefore essential to feed animals adequately both in terms of quality and quantity. Feedlot rams should be given good quality grain or legume hay at daily rates 1-2.5kg depending on size of ram and type of hay plus 0.2-0.5kg of a concentrate rations for sheep.

The following ration combinations will be adequate

A. Maize 25%

	Cottonseed cake	25%
	Wheat offals	30%
	Brewer's dried grain	20%
B	Wheat offals	40%
	Cottonseed cake	25%
	Brewer's dried grain	25%
	Molasses	10%
C.	Wheat offal	35%
	Palm kernel cake	30%
	Brewer's dried grain	25%
	Molasses	10%

Where labour is cheap, rations may be offered in equal installments of 2 or 3 times daily. Otherwise rations could be offered once daily. Water and mineral salts licks should be provided ad-libitum. Where rams for fattening are from the farm flock, weaned lambs should be kept in groups and fed high quality chopped hay (preferably legume) ad-libitum until they weigh 20kg each. Thereafter, they should be transferred to the feedlot pen and fed as described above.

Washing of feedlot rams with soap and grooming 4 days before sales makes them attractive to buyers.

Common Diseases of Sheep

Foot and Mouth Disease

It is a highly communicable viral disease which affects animals. It is characterised with high fever, vesicles and blisters formation around the mouth, teats, udders and the skin between toes and above hoofs. The vesicles later rupture into ulcer. The diseases spread through direct contact with the infected animal or through indirect contact or infected manure, hay, forages, water, rats, birds and livestock attendants. There should be proper sanitation, rotational grazing and annual vaccination. The only control measure is to bury and burn the infected animal.

Rinderpest

It is very destructive among cattle, buffaloes, sheep, goats and deers caused by virus. Infected animals develops high temperature which reaches a peak in a day or two and lasts for two to seven days. The animal becomes dull with congested conjunctiva, dry muzzles and loss of appetite, constipation and dirhoea. Lesions show on buccal mucous membrane, on the lip

and gum on the seventh to ninth day. The lesions later develop into ulcer resulting in a loss of appetite, severe diarrhoea and later the animal dies. The animal should be vaccinated using Tissue Culture of Rinderpest. It must be noted that Vaccination against rinderpest is usually necessary in Africa.

Anthrax

It is caused by *Bacillus anthracis* (Bacteria). No symptom may be observed before the death of infected animal but black tarry exudates from the various body orifices after death. There is always an incubation period of about 1-2 weeks after which the animal dies suddenly without any sign. The animals could be treated with antibiotics. The infected animal should be burnt and buried while the premises should be thoroughly disinfected.

Peste des petits ruminant

Peste des petits ruminants (PPR) is a highly contagious and infectious viral disease of domestic and wild small ruminants. It is characterized by the sudden onset of depression, fever, discharges from the eyes and nose, sores in the mouth, disturbed breathing and cough, foul-smelling diarrhoea and death. The virus which causes PPR, the peste des petits ruminants virus (PPRV), belongs to the morbillivirus group of the paramyxovirus family of viruses. It is closely related to the rinderpest virus of cattle and buffaloes, the measles virus of humans, the distemper virus of dogs and some wild carnivores, and the morbilliviruses of aquatic mammals. To date, genetic characterization of PPR virus strains has allowed them to be organized into four groups; three from Africa and one from Asia. One of the African groups of PPRV is also found in Asia. The epidemiological significance of these groupings is less clear at present than that of rinderpest virus groupings.

Chlamydia, or enzootic abortion

This affects two–five percent of ewes. This disease has become more prevalent in the Midwest since 1970. The ewe usually is sick and won't eat for two or three days. The placenta is retained and is brown in color. The ewe usually has a vaginal discharge. Abortion occurs during the last four weeks of gestation. There is now a vaccine (killed bacterin). In case of an outbreak, antibiotics help, but the low incidence lessens its practicability.

PregnancyDisease

Pregnancy disease is an upset or interference in the metabolism cycle of carbohydrates; it is

not related in any way to the amount of exercise the ewe gets. In converting fatty acids and particularly body fat to glucose, ketones accumulate in the bloodstream and blood glucose levels decline. The ketones are very toxic to the ewe, resulting in death within two–five days. Pregnancy disease occurs only among ewes carrying multiple fetuses and usually only during the last four–five weeks of gestation. The ewe stops eating, which reduces her source of carbohydrate. She separates from the flock, often wanders aimlessly, and may press her head against-the-barn-or-feedbunk. Unless a ewe is treated very soon after the first signs are noticed, little can be done. Separate her from the flock, drench her with ½ pint propylene glycol twice a day until she eats, and offer her grain and hay. Drenching with glucose, honey, or molasses or injecting 40–50 cc of 5–10% glucose under the skin also may be used with reasonable success. If the ewe is not treated the first day, however, the prognosis is poor. To prevent pregnancy disease, keep ewes gaining weight during the last four weeks of gestation. Increase the energy intake by feeding, in addition to hay, .5–1.0 pound grain per ewe daily. **Fat ewes may be more susceptible**, because they have difficulty increasing in weight, have limited feed capacity in relation to their size, and have an abundant amount of fat-to-convert-to-energy.

Mastitis

Mastitis (acute pasteurella) is the major reason producers cull ewes. Mastitis is associated with lambs with sore mouth and incorrect "drying up" of the ewe at weaning. Minimize re infection by isolating the infected ewe and her lambs. Palpate udders in the fall and cull ewes with indications of scar tissue. Mark infected ewes at lambing time. Avoid udder injury, and cull ewes with pendulous udders. Treatment includes giving sulfamethazine at one grain per pound of body weight (two bolus), intramammary infusion of the udder (by a teat tube), or intramuscular injection of 8–10 cc of tetracycline.

Footrot

Footrot is a grievous disease that almost defies curing. For a small flock of grade ewes, selling out and starting over is the wisest decision. Footrot is caused by two bacteria—*Fusobacterium necrophorum* and *Bacteroides nodosus*—that act synergistically. *F. necrophorum* is common in most manure; it is very hardy and can live for years in manure. It contributes to footrot in cattle and causes thrush in horses. *B. nodosus*—apparently lives only in sheep hooves. It dies out in soil in two weeks. It grows very slowly, so the incubation period may be long. Foot abscesses may be caused by *B. nodosus*, but footrot requires the presence of both *B. nodosus* and *F. necrophorum*. Moist soil

conditions contribute greatly to the cause and spread of footrot. To-control-and-treat-footrot: Trim the hoof wall to the quick in all **sheep**. Soak affected hooves for five minutes in a foot bath containing 90% water and 10% formalin (37% formaldehyde) or 10% zinc sulfate. Zinc sulfate is as effective as formalin and is safer to use. Isolate limpers and repeat one week later. Turn apparently cured **sheep** into an uncontaminated area. Doing so does create a problem, however, because some **sheep** thought to be clean actually still are infected. With time and moist conditions, they will reinfect other **sheep**. Reexamine **all sheep** and remove any limpers you initially thought were clean. Force **sheep** to move through a 10% zinc sulfate solution daily for 30 days. This has become the most-successful-treatment-scheme. Sell-persistent-limpers. If you sell **all sheep**, wait three weeks-before-bringing-in-new-**sheep**.

Sore-Mouth

Sore mouth (contagious ecthyma) is caused by a virus. Herpes ulcers develop on the lip and tongue of the lamb and on the udder of the ewe. An abrasion on the lips seems to contribute to its incidence. It is more prevalent in lambs raised on rubber nipples. Vaccinate if you have infected **sheep** running with susceptible **sheep** (young lambs). If you show **sheep**, vaccination is a must. For most **sheep** it is of little concern. Other than with baby lambs, let it run its course. It is a virus, so antibiotics are ineffective. Vaccinate at two–three days **if** you have had previous problems and have brought in unexposed **sheep**.

Lamb-Starvation

Lamb starvation, the **number one killer of lambs**, often is associated with lack of shepherding. Contributing-causes-are: The lamb doesn't get started (gets no colostrum). Seventy-five percent of lambs that don't get colostrum die for one reason or another. The-ewe-won't-claim-the-lamb.

Mastitis

The teat is too big or is too near the ground and the lamb doesn't find it.

Sore-mouth.

The ewe can't feed two lambs (mastitis, too little feed, etc.). Joint-injury-or-illness. Pneumonia, which often is associated with lambs that received no colostrums-and-thereby-lack-immune-bodies.

Difficult-parturition

A "genetic will to die." Actually, the majority of lambs die for no apparent reason. A

genetically caused lack of vitality may well be the cause.

Pneumonia

Pneumonia, the number one lamb disease, occurs because of a lack of colostrum, because of "mastitis milk," or because ewes are heavily infected with pasteurilla (99% are infected, so the organism is always present). A lamb contracts pneumonia because it can't stand such stresses as too little milk, draft, dampness, and ammonia off a manure pack. Diagnosis of sick, unthrifty young lambs is relatively simple, because 90% of the time they are either starving or have pneumonia. Strive for early detection and start antibiotic treatment before the lungs have been permanently damaged. Treatment for pneumonia is to inject the lamb with antibiotics (tetracycline, penicillin, or streptomycin) plus one grain sulfamethazine per pound of body weight. Adequate selenium and vitamin E help the lamb withstand pneumonia. Keep the lamb strong!

Baby-LambScours

Scours are due to one of many bacteria. To minimize the problem, an adequate intake of colostrum (eight to 12 ounces of either ewe or cow colostrum) is absolutely essential. Scours may hit the lamb the first day of life. The lamb succumbs due to added stress (draft, ammonia, poor ventilation). *Clostridium perfringens* type C may be the cause of baby lamb scours. Vaccinate the ewe four weeks prelambling to prevent it. Treat scours with a 250 mg tetracycline capsule orally, injection of 1 cc penicillin or tetracycline (IM). *E. coli* salmonella often is the cause.

Coccidiosis

Coccidiosis usually occurs in lambs four weeks or older. It is caused by protozoa. Treat it with amprolin or sulfamethazine (one grain per pound of body weight). Rumensin, 15 grams/ton, in feed prevents it. Rumensin is approved for cattle but not **sheep**.) Bovatec, 40 g/ton of feed, is also effective. Electrolyte-baking soda or consomme soup are supportive treatments. Lambs usually show blackish, blood-tinged diarrhea and are reluctant to eat.

Tetanus: Tetanus is caused by *Clostridium tetani*, which persists in the soil of most farms. Next to horses, **sheep** are the most susceptible farm animal. The bacteria are anaerobic, so wounds in which air contact is limited are most susceptible to tetanus. Docking and castrating with rubber rings increase the incidence of infection. Disinfecting docking and castrating wounds will minimize it. Infected **sheep** become stiff, move with a straddled gait, and usually die. Vaccinating with tetanus toxoid and anti-toxin prior to docking is effective.