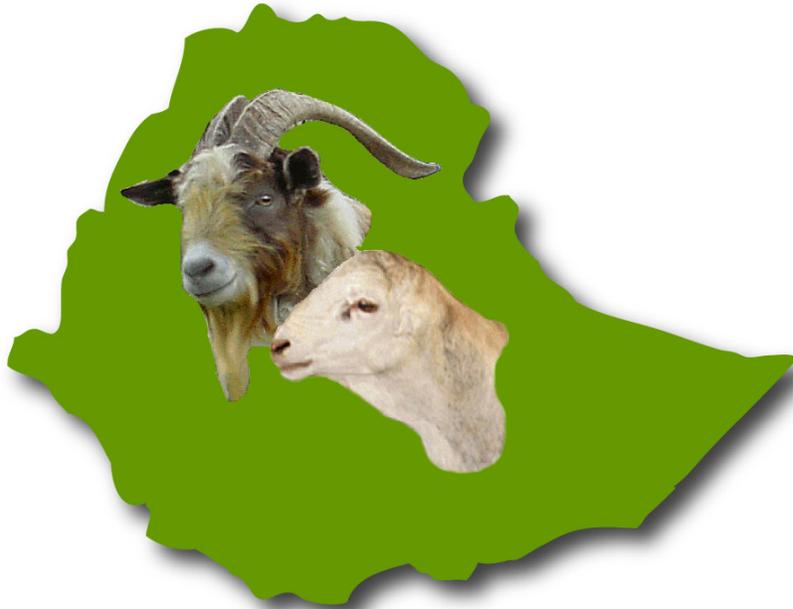




TECHNICAL BULLETIN No.15
SUCCESSFUL REARING OF LAMBS AND KIDS



ESGPIP

ETHIOPIA SHEEP AND GOAT PRODUCTIVITY IMPROVEMENT PROGRAM

Further information:

Ethiopia Sheep and Goat Productivity Improvement Program (ESGPIP)

Tel. +251 011 416 6962/3

Fax: +251 011 416 6965

E-mail: pvamrf_ethiopia@ethionet.et

FOREWORD

This Technical Bulletin titled “*Successful rearing of lambs and kids*” is produced by the Ethiopia Sheep and Goat Productivity Improvement Program (ESGPIP). The ESGPIP is a USAID funded Project with the objective of improving the productivity of Ethiopia’s sheep and goats.

Lamb and kid mortality under the smallholder system can exceed 50%. This is a major cause of the low productivity of the system. This Technical Bulletin is intended to serve as an extension aid for Kebele Development Agents (KDAs) to train and advise farmers to manage, feed and control diseases that are the causes of lamb/kid mortality. It is believed that the information contained in this technical Bulletin will be transferred to Sheep and goat producers and help them reduce the mortality of lambs and kids and thereby productivity and economic benefits. It will also be useful for other users engaged in the production of other types of ruminants.

At this juncture, I would like to thank all those involved in the preparation and review of this technical Bulletin.

Desta Hamito (Prof.)
Chief of Party
ESGPIP
August, 2008

TABLE OF CONTENTS

FOREWORD.....	i
TABLE OF CONTENTS	ii
1. Introduction	
2. Care of newborn lambs	
2.1. Feeding and management during pregnancy	
2.1.1. What happens if pregnant ewes/ does are underfed?	
2.1.2. What happens if ewes/does are over-fed?	
2.2. Care of the dam at parturition	
2.3. Care of the lamb/kid after birth	
2.3.1. Management and care just after lambing/kidding	
2.3.2. Feeding of the newborn	
2.3.2.1. The milk feeding period	
2.3.2.2. Type of milk feeding	
2.3.2.3. Devices for feeding milk	
2.3.3. Weaning	
2.3.3.1. Age and/or weight as weaning criteria	
2.3.3.2. Step-wise weaning or abrupt weaning?	
2.3.4. Environmental conditions (housing)	
2.3.5. Common disease to watch for during rearing of lambs/kids	
2.3.5.1. Coccidiosis	
2.3.5.2. Enterotoxaemia	
2.3.5.3. Pneumonia	
2.3.5.4. Haemonchosis	
3. SUMMARY	

SUCCESSFUL REARING OF LAMBS AND KIDS

Prepared By: Girma Abebe

Edited by: Alemu Yami, R.C. Merkel and A.L. Goetsch

1. Introduction

Profitability of small ruminant enterprises for meat production depends on the number of young produced that are either sold for meat or join the flock as replacement breeding stock. The number raised for market is a reflection of complete flock/herd management throughout the year. The goal of productivity improvement can be achieved by increasing the number of lambs/kids successfully reared per ewe/doe in a given season. Rearing of lambs and kids will be discussed in this bulletin with regard to different phases of development and (or) growth.

2. Care of newborn lambs

The care for lambs/kids begins when the fetus is in the uterus of the dam, especially in the last one-third of gestation. The care of lambs/kids is thus presented as care before and after birth.

2.1 Feeding and management during pregnancy

Supplying feeds of high quality during this period contributes immensely to survival of newborn lambs/kids. As parturition nears, the dam should be fed supplemental concentrate in addition to good quality fresh forage or hay. It is recommended that ewes/does be provided with 50 g/day of concentrate per kg of metabolic body weight (body weight^{0.75}) starting 90 days of gestation. Improper nutrition of the dam during this period results in small, weak lamb/kid at birth with little internal fat. Care should be taken to neither under- or over-feed during this period.

2.1.1. What happens if pregnant ewes/ does are underfed?

This will result in energy deficiency and lead to what is known as '*pregnancy toxemia*.' This is a reduced blood sugar level that will finally lead to abortion and neonatal death. Dams that are not properly fed (malnutrition) will give birth to weak kids. The birth weight of such kids/lambs is usually below the average for the population. This problem is most frequently encountered in twin-bearing animals.

Prevention of pregnancy toxemia in animals carrying twins or triplets requires supplying the protein and energy requirements of the dam and the developing fetuses without causing digestive disturbances. Offering good quality forage and supplementation with about 250 to 350 g/day of concentrate mix in the last 3 to 4 weeks of pregnancy is appropriate. When good quality hay is not available, as in many places in Ethiopia, the concentrate mix will have to be increased beyond what is indicated above.

2.1.2. What happens if ewes/does are over-fed?

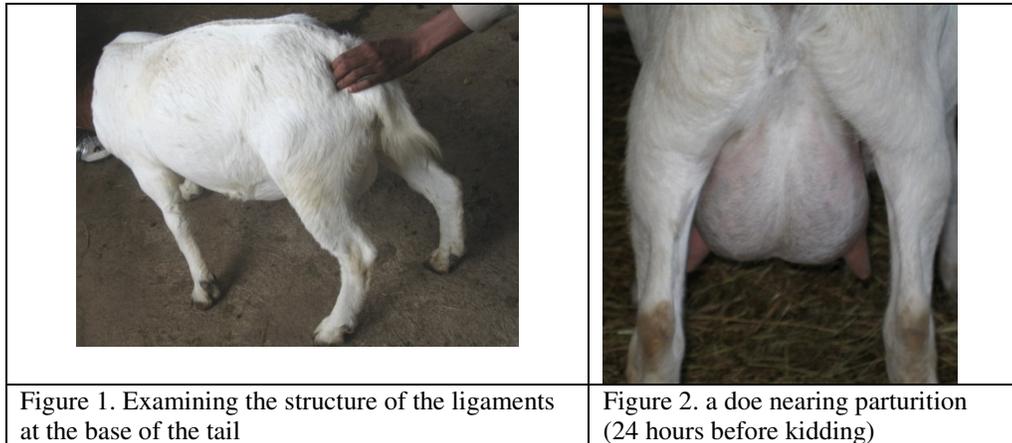
Over-feeding will lead to difficult birth or '*dystocia*' due to an over-sized fetus and might result in death of the newborn. Dystocia is usually more of a problem with single than multiple births. It

should be noted, however, that not all dystocia is attributed to over-feeding. Some studies have shown dystocia to be related to particular ram or buck in the flock/herd.

2.2. Care of the dam at parturition

Knowing signs that are indicative of approaching lambing/kidding is helpful to provide appropriate care when needed. The most noticeable changes are:

- The udder starts falling-out as the time of parturition approaches. This phenomenon is more prominent in high-milking ewes and does. In Boer goats, the udder can be very large as shown in Figure 2.
- The attachment around the pelvis starts loosening and the vulva dilates.
- In advanced cases mucus secretion can be noted on the vulva.



Softening and total disappearance of the ligaments around the base of the tail are good indications that parturition will occur in the next 12 hours.

In most cases, pregnant ewes/does do not require assistance during lambing or kidding. This is especially true if the presentation of the fetus is normal. In circumstances when assistance must be given to correct a difficult birth, the **30-30-30** rule is used as a guide.

- If a ewe or doe goes into labor or part of the fetus or placenta shows, allow 30 minutes for delivery to be completed before examining the dam.

An exception would be if the lamb or kid is yellow with meconium, indicating that it is already short of oxygen and needs to be delivered rapidly.

- If everything appears to be in normal position and posture, allow a further 30 minutes before delivering the lamb or kid.
- If the dam has had one or more fetuses unassisted but an additional fetus is believed to be present (partly visible, further straining, fetus can be felt through the abdominal wall), allow a further 30 minutes to elapse before delivering the next fetus. When assistance has to be given, a veterinarian or experienced practitioner in the area should be called upon. Refer to technical bulletin No.7 for detailed information on lambing/kidding and provision of assistance.

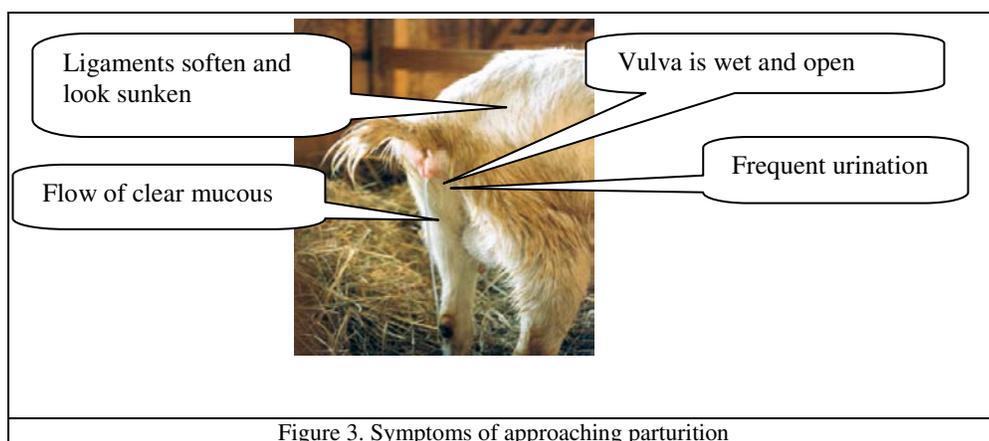


Figure 3. Symptoms of approaching parturition

2.3. Care of the lamb/kid after birth

2.3.1. Management and care just after lambing/kidding

The first 24 hours of life of the newborn is most critical for survival. During this period, energy demands are high & physiological adjustment to the new environment is great. Normally, the dam

will clean and dry its offspring. If this does not occur, it is important to dry the newborn with a dry towel. In the absence of a towel, clean dry grass can be used. Apart from drying, this rubbing stimulates breathing. In most instances, newborn lambs and kids will stand and suckle within the first 20 minutes. Lambs and kids weak at birth because of low birth weight, prolonged delivery, etc. may need assistance to suckle.

If lambing or kidding takes place in confinement the umbilical cord should be shortened with a pair of scissors if it is long and then dipped in 7% tincture of iodine. A film canister holds the right amount of iodine and avoids contamination of a larger stock bottle. The untreated navel is an excellent route for infectious agents to enter the lamb/kid causing internal abscession or *navel ill*. Check for any abnormality in the udder of ewes/does. The first milk could be stripped from each teat to remove any plug that might interfere with suckling. In some cases it may be important to wash the udder.



Figure 4. A lamb or kid that has eaten will have a bulging belly when it is held up by the front legs.

2.3.2. Feeding of the newborn

Kids and lambs at birth have a digestive system similar to pigs and humans, hence the term pre-ruminant. During these first stages of milk feeding, the abomasum (true stomach) and small intestine play a relatively important role with respect to digestion and nutrition. In young lambs and kids, as well as other young ruminants, the suckling reflex triggers the esophageal groove to close so that milk bypasses the rumen and flows directly into the abomasum where clotting and some digestion occur. Milk protein is rapidly digested in the small intestine, as is lactose. If the esophageal groove does not close, for whatever reason, then milk goes into the rumen where it 'ferments,' allowing digestive upsets to become a problem.

When lambs/kids begin to eat solid food (roughage or concentrate diet), these feeds stimulate the rumen and lead to development of the microbial population. The reticulo-rumen and the large intestine rapidly increase in size relative to the abomasum and small intestine. This change from pre-ruminant to ruminant is a gradual process. Fibrous feedstuffs (forages) encourage rumen

development. For this reason, it is recommended that young animals have access to forage as early as two weeks.

Changes in the digestive system have a large impact on feeding methods used in raising lambs/kids and should be kept in mind during all feeding management decisions.

The feeding and nutrition of young sheep and goats will be discussed in three different periods: milk-feeding, weaning, and post-weaning.

2.3.2.1. The milk feeding period

The milk-feeding period lasts from birth until the kid no longer consumes milk. Accordingly, its duration is highly variable, lasting from 3 weeks in intensive systems or to 5 or 6 months in extensive systems. For the first few days of life lamb/kid should be fed frequently.

The first milk a lamb/kid should receive is the colostrum. Colostrum has many functions and properties, which probably makes it the most complete nourishment. The three most significant functions of colostrum are:

1. It is laxative and aids in the excretion of the *muconium*, which is the first intestinal discharge of the new born. It has a viscid sticky consistency. Muconium is considered to be the accumulation of debris that accumulates during fetal life.
2. It has high nutritive value and, thus, provides an excellent energy source for the newborn. The high fat content of colostrum serves that purpose.
3. It imparts passive immunity as it contains antibodies (immunoglobulins) to protect the newborn until its own immune system begins functioning at about 3 weeks of age.

Note that immunoglobulins can only be absorbed during the first 24 hours of lamb's/kid's life

In areas where refrigeration facilities are available, as on commercial farms, preserving extra colostrum for future use is highly recommended. It is recommended that lambs/kids receive 10% of the body weight in colostrum by 24 hours. This means a kid with birth weight of 3.0 kg need to consume 300 grams of colostrum.

Lambs/kids deprived of colostrum will probably be stunted and sick most of their lives. If they live through the first month or 6 weeks, they will probably survive because they can then build their own immunity.

Lambs/kids deprived of colostrum will probably be sick most of their lives.

The composition of colostrum of sheep and goats is given in Table.1 along with that of the cow.

Table 1. Composition of sheep, goat and cow milk

Species	Total Solids (TS)			Constituents								
				Fat			Protein (CP)			Lactose		
	1 st day	2 nd day	3 rd day	1 st day	2 nd day	3 rd day	1 st day	2 nd day	3 rd day	1 st day	2 nd day	3 rd day
Ewe	33.0	25.0	20.0	11.0	10.0	9.0	18.0	10.0	7.0	3.2	4.0	4.5
Doe	32.0	18.0	17.0	8.0	7.0	6.5	16.0	6.0	5.0	2.8	4.0	4.3
Cow	23.9	14.1	13.6	6.7	3.9	4.4	14.0	5.1	4.1	2.7	4.4	4.7

As can be noted from Table 1, abrupt fall in TS and CP contents occur in the first 3 days in sheep and goats. Furthermore, the differences between ewes and goat in lactose content is small compared to other constituents

Lamb or kid survival depends on optimum birth weight and intake of adequate amount of colostrum with high immunoglobulin.

Problems that could arise in colostrum feeding:

- **Problems associated with colostrum quality:** these can arise from young, sick, undernourished, and poorly vaccinated dams
- **Problems in ingestion:** can arise from weak, sick neonates, competition with other lambs or kids, and separation from the dam
- **Problems in absorption:** could arise from delay in ingestion, weakness, sickness, hypothermia (chilling), hypoxemia

What if preserved colostrum is not available? Usually there is more than one animal lambing and kidding within 2 to 3 days. In that case, colostrum from other animals could serve as a substitute.

What if the newborn does not nurse itself? If the newborn fails to suckle the dam, an alternative is to use bottle feeding. A small number of lambs/kids can be fed using individual bottles with rubber teats.

How long should a newborn remain with its dam before the dam is allowed to go out for grazing? It is very important that the newborn stays with its dam for the first 4 days of life. This is essential to establish the dam-offspring bond. Lambs/kids are labeled by their dams during the first physical contact. It is, therefore, advisable to keep the dams with the offspring for at least this period.

Are all dams capable of raising their young? If not, what measures should be taken? Not all dams are alike in terms of their ability to raise kids. Ewes and goats giving birth for the first time (primiparous) need more time to develop mothering ability. It also appears that mothering ability is

different between breeds. It is recommend that ewes and does with poor mothering ability be identified and be culled. This trait is particularly important in free grazing systems where parturition occurs without assistance of attendants.

Under normal conditions, twins get about equal chance to nurse, since the dam gives the weaker kid a priority in nursing. However, if the vigor of the lambs/kids differs beyond a certain limit, this mechanism does not work and the weaker kid will be abandoned. Special precautions need to be taken to ensure that both get equal chance. Even then, the amount of milk produced by the mother may not be adequate and in that case special care needs to be taken. This may include more supplemental feeding of dams nursing twins to increase milk production, using a fostering mother whenever possible

2.3.2.2. Type of milk feeding

Results from several experiments that compared performance of kids raised on goat milk, cow milk, or milk replacer indicate that they will grow just as well on good quality milk replacer as on goat milk although feed efficiency appears to be higher (less milk for the same weight gain) with goat milk, especially during the first 30 days.

2.3.2.3. Devices for feeding milk

When a lamb or kid does not suckle the dam for some reason, milk may need to be offered using various devices. Lambs/kids fed with artificial nipples (bottle or kid bar) have fewer digestive problems and less bloating than those fed with a pail or pan.

		
<p>Figure 5 . Bottle feeding colostrum – The size of teat should be long</p>	<p>Figure 6. Feeding large number of kids</p>	<p>Figure 7. Feeding colostrum to a weak kid using a syringe – Insert a finger into the mouth and pour milk along the finger</p>

2.3.3. Weaning

The weaning period, defined by passage from feeding of milk to solids, is a critical phase characterized by a slowing or stoppage of growth or even weight loss. This is referred to as weaning

shock. The level or degree of shock depends on weaning age and weight of the lambs/ kids as well as the feeding program before weaning.

Other factors contributing to weaning shock include sex (males are more susceptible to weaning shock than females) and health status. Healthy lambs/kids experience less shock than animals fighting a disease or infection, such as Coccidiosis.

Every effort should be made to minimize factors that stress the lambs/kids, especially if those factors can be removed or minimized by management.

In Kenya, sweet potato vine has been used as an excellent feed for weaned kids.

2.3.3.1. Age and/or weight as weaning criteria

Weaning can occur as early as 4 weeks (1 month) provided that the quality of the solid diet is high. However, it should be noted that the earlier the weaning the more marked the weaning shock. Furthermore, early weaning can cause a delay in compensatory growth, sometimes until 5 or 7 months of age. Compensatory growth refers to accelerated growth following a period of limited feed intake resulting in full or partial recovery of weight that was not gained during the weaning shock period.

Age alone is not a sufficient criterion for weaning. In fact, in many instances weight is a better indicator than age. As a rule of thumb, weaning can take place when birth weight is tripled (i.e., when weight is three times greater than birth weight), provided that the birth weight is near or greater than the average for the particular breed.

From studies with both goats and lambs, body weight is more important in determining an acceptable time of weaning than age to minimize weaning shock.

The onset of sexual behavior in lambs/kids occurs very early, at about 3-4 months, so it is advisable to separate males and females at that age to avoid early mating and consequent growth retardation.

2.3.3.2. Step-wise weaning or abrupt weaning?

The general opinion on weaning method is that if early weaning is desired, the process of weaning should be gradual. This can be achieved by restricting the frequency of suckling or decreasing the amount of milk offered. On the other hand, if late (older lambs/kids) weaning is practiced, abrupt weaning is also appropriate.

2.3.4. Environmental conditions (housing)

Lambs and kids at birth are frail and thermoregulation is sometimes delicate. Therefore, housing conditions must be good. Conditions must be optimal to maintain good health and achieve rapid growth and efficient feed use. Drafts must be avoided and a minimum temperature of 14°C maintained in the first days after birth. Clean and dry bedding is mandatory in concrete houses. A lamb/kid box like that shown in figure 8 could be used to keep kids/lambs dry and warm. The box may be constructed from locally available materials, such as bamboo.

In the highlands, where temperatures often fall below zero, lambs/kids could die from hypothermia (chilling). For this very season it may be important to provide supplemental hating during the cold season.



Figure 8. Kid box used at Hawssa University goat farm

It is important to note that the behavior of kids and lambs is different. Kids like to jump and climb on things around them; for that reason there are often accidents, including strangulation. These must be taken into account when choosing the housing installations.

Kids like to jump and climb on things around them.

2.3.5. Common disease to watch for during rearing of lambs/kids

Lamb and kid morbidity and mortality are serious constraints for increasing productivity of sheep and goats. Reduction of lamb/kid morbidity and mortality can be achieved only by identifying and targeting specific cause. The important causes are briefly discussed below.

2.3.5.1. Coccidiosis

This is a contagious disease of young sheep and goats. It is caused by a tiny protozoan parasite, *Eimeria spp.* that lives in the cells of the intestines. Infection with coccidia is virtually impossible to avoid. The feces of sick sheep/goats contain many coccidia (*oocysts*), the number of which determines the severity of the disease. Coccidia must sporulate outside the host to become infective. Sporulation occurs under moderate temperature and high moisture conditions. The non sporulated and

sporulated oocytes can survive a wide range of temperature and may survive for years under certain conditions. Clinical form of the disease is often seen when some form of stress (e.g, dietary change, weather changes, weaning, parturition) is occurring in the flock. The disease is most often seen when sheep/goats are crowded into unclean quarters.

Symptoms: Watery diarrhea and may contain blood mucus; Dehydration; Loss of appetite; Loss of condition (rough hair coat)

Prevention: Maintain a high level of sanitation and rear young animals in dry conditions with as much sunlight as possible; Avoid overcrowding and stress; Keep lambs/kids out of feed troughs as Lambs/kids commonly love to stay in feeding troughs to keep themselves warm, particularly when it is cold; Arrange water troughs so that manure will not contaminate the water.

Treatment: The best treatment for individual animals is a first dose of sulfa drugs at 200 mg/kg body weight, followed by a half dose for 4 days. Supportive care includes mixing ½ teaspoon of salt and 6 teaspoons of sugar in 1 liter of clean warm water and giving the dehydrated kid ¼ to ½ liter of the solution 4 times a day for 3 days

2.3.5.2. Enterotoxaemia

The cause of the disease is the toxin (poison) produced by the bacterium *Clostridium perfringens* type C or type D. This bacterium is a normal inhabitant of the intestinal tract of sheep and other mammals, and, is normally not a problem. However, there are certain conditions (stress, sudden change of feed, etc.) that trigger excessive bacterial growth that results in production of lethal amounts of toxin. The disease is often associated with feeding lush fast-growing pasture or cereal crops, heavy grain feeding, or accesses to a high amount of milk, hence the name overeating disease.

Entrotoxemia is usually associated with high concentrate diets.

Symptom: In the acute disease condition, a lamb/kid may be found dead with no signs or lesions. Severe depression followed by bloody diarrhea may be observed. It may occur after consuming excess feed, sudden access to highly palatable feed, or prolonged hunger and a normal quantity of feed. The Sub-acute disease is more apt to occur in older kids and adults. They may be ill for several days or weeks and may refuse to eat. There may be intermittent severe diarrhea occasionally with epithelial shreds in the feces.

Prevention: Avoid sudden changes to the diet. There should be a gradual transition of two to three weeks when going from roughage to a diet high in concentrate. Feeding at regular intervals, proper ration mixing, and providing adequate feeder space will also help to prevent problems. The feeding of antibiotics will help to prevent enterotoxemia in feedlot lambs. When available, a vaccine can be used to protect the flock.

Treatment: Treatment is ineffective with acute cases but aggressive supportive care which includes administration of *C. perfringens* type D antitoxin that might help.

2.3.5.3. Pneumonia

The broad term pneumonia is used to describe infectious and non-infectious causes of inflammation of the lungs. The disease may be acute (causing sickness and death in few hours) or chronic (continuing for years).

Pneumonia can be caused by several agents including bacteria, viruses, as well as parasites. However, environmental stresses are far more important than the microorganisms that are normally found in surroundings of the lambs/kids. These stressors include overcrowding; poor ventilation as evidenced by smell of ammonia; temperature fluctuations (sudden changes in temperature or extreme cold); bad weather such as strong winds and heavy rain; humidity

Symptoms: Fever; runny nose; fast and difficult breathing; gasping for air and coughing

Prevention and treatment: Avoid management problems that cause stress to animals; provide appropriate housing (proper ventilation and gas and moisture control); continually provide available fresh feed and water; use antibiotics (long-acting oxytetracycline) or sulfa drugs.

2.3.5.4. Haemonchosis

Among many nematodes that affect sheep and goats, the most significant one is *Haemonchus* species with respect to both clinical disease and anthelmintic resistance. Most of these parasites affect the abomasum or small intestine of young, recently weaned animals and occasionally adult animals. Overcrowding and overgrazing with concurrent parasite mismanagement and malnutrition usually increase susceptibility to these parasites.

Inadequate nutrient or protein intake may result in greater susceptibility to haemonchus infestation

Control program: The main objective of a control program should be to minimize economic losses associate with haemonchosis by containing the parasite population at levels that do not significantly affect production of their hosts. In control programs, the parasite population can be maintained at such levels by strategic use of anthelmintics or by limiting parasite-host contact through grazing method. Control programs include strategic deworming, tactical deworming, or a combination of strategic and tactical programs and treating animals unable to cope with parasite challenge .

- **Strategic deworming:** This aims at reducing the frequency of treatment with anthelmintics and to maximize the potential benefit by considering environmental and management factors. This is used when most of the parasites are inside the animals and not on pasture. Treat lambs or kids at weaning and moving them to a safer place (parasite, cleaned shelter). Another

example for the flock includes, deworming before the onset of rains. Epidemiological data is required to develop strategic drug utilization schemes for specific area or region.

- ***Tactical deworming:*** This is used to remove parasites from the hosts before they enter their reproductive phase and contaminate the pasture. An example of tactical deworming is treating animals 10 to 14 days after a rain, particularly if the rain has followed a drought. Parasite transmission during this period is worse in most flocks during this time as pasture becomes heavily contaminated.
- ***Treating animals unable to cope with parasite challenges:*** This system has been developed as a result of escalating anthelmintic resistance. For this approach to be successful, a method for identifying those animals in danger of being overwhelmed by parasites needs to be used. The FAMACHA system (see Bulletin No.) has addressed this issue.

Nutrition- parasite interaction

It has been frequently suggested that the nutritional status of the host can influence the pathogenesis of parasite infections. It is generally accepted that well-nourished animals withstand parasitism better than those less adequately fed. The diet may not only influence host resistance to either initial infection or reinfection but may also affect the ability of the host to withstand the various consequences of infection.

A cardinal feature of gastrointestinal infection is the loss of considerable quantities of host protein into the gastrointestinal tract. Thus manipulation of nutrient supply particularly protein-rich feed stuff e.g. tree legumes is suggested as a means of limiting parasite related losses in grazing animals by balancing the increased dietary requirements of infested animals.

3. SUMMARY

Lamb and kid mortality is one of the most serious challenges in sheep and goat production. Mortalities can exceed 50% under traditional systems of management. Ways and means of reducing lamb and kid mortality through proper husbandry, feeding and health care is described in this technical bulletin.