

BEST PRACTICES FOR REDUCING THE NEONATAL MORTALITY IN SHEEP FLOCKS



C.P. Swarnkar, G.G. Sonawane and S.R. Sharma

All India Network Programme on Neonatal Mortality in Farm Animals



**Division of Animal Health
ICAR-Central Sheep and Wool Research Institute
Avikanagar, Rajasthan- 304 501**



In both the arid and semi-arid region of Rajasthan, sheep husbandry plays a key role in sustainable livelihood of the rural poor. The lambs are usually sold at the age of 3 to 4 months, thus, their survival is highly important for the shepherds to earn more returns. Reduced physical losses and improved productive potential ensure sheep after farming as profitable.

Neonatal losses include deaths within 28 days of birth. Based on long-term retrospective study on neonatal lamb mortality in sheep flocks maintained under semi-intensive management system at organized farms in arid and semi-arid Rajasthan, it was observed that the lamb losses during the neonatal period constitute a major source of economic losses. The managerial (hygienic, shelter, lamb care), non-genetic (related to dam and lamb) and climatic (rains, wind, lack of sunlight etc) are primarily associated with majority of neonatal deaths. Thus, these factors should be given due attention while evaluating neonatal losses, as the numbers of weak and small lambs produced in such circumstances particularly in extreme climatic conditions can increase the mortality rate. To curtail the lamb losses occurring during neonatal phase in sheep flocks, best practices in the form of Standard Operating Procedures (SOP) has been developed at ICAR-Central Sheep and Wool Research Institute, Avikanagar (Rajasthan).

In lambs, neonatal period (birth to first 28 days of life) is the most critical. Neonatal mortality includes:

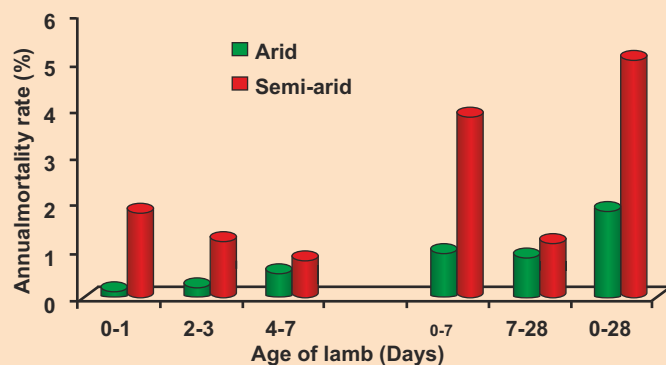
- (a) Death during the first week of life (hebdomadal)
 - i. Immediate phase (0-1 day)
 - ii. Delayed phase (2-3 days)
 - iii. Late phase (4-7 days)
- (b) Death subsequently to the first week and until the 28th day of life (post-hebdomadal)

Farm based profile on neonatal mortality suggest losses ranging from 4 to 20% during neonatal phase and more specifically in the first week of life (>50%). Neonatal lamb mortality is a multi-factorial issue and associated with environmental (climate, hygiene, surveillance and monitoring of the flock), ewe (age / parity, litter size, mothering behaviour, body condition score, udder health and colostrums production and genetics) and lamb factors (birth weight, sex, vigour, colostrum intake, type of wool coat and genetics).

To maximize farm profit through adopting best after practices it is necessary to understand the role of different factors that influence mortality of lambs during neonatal phase. Mortality due to non-infectious causes is reported to be higher than that of infectious causes and this implies the importance of improved farm management practices.

Magnitude of neonatal mortality

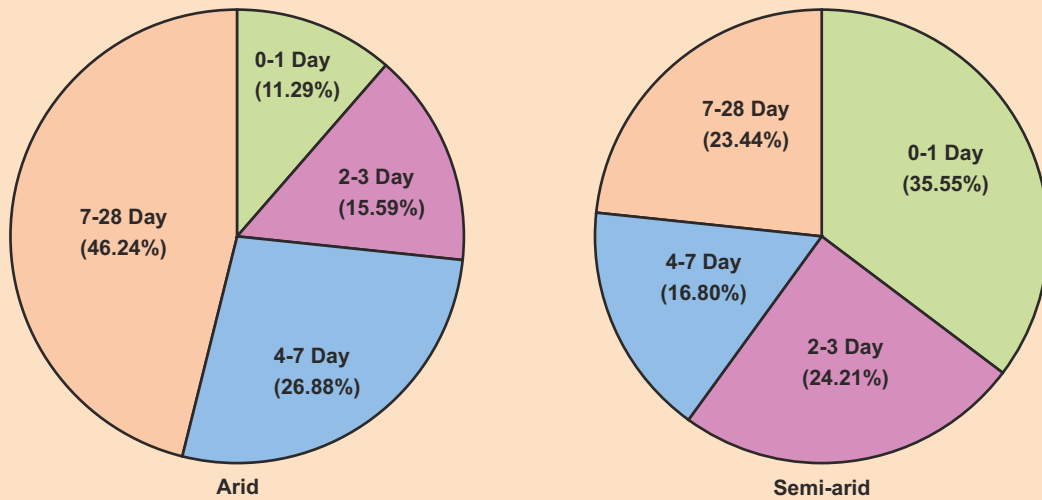
In sheep flocks reared under farm conditions, the annual neonatal mortality averages around 1.86% in arid and 5.12% in semi-arid regions.



in semi-arid Rajasthan. Among different phases of neonatal life, higher death rate was during hebdomadal phase (first week of life).

When do losses occur ?

In semi-arid region, the majority of lamb deaths (59.76%) happen within 72 hours of birth in contrast to after 72 hours of birth in arid region.



Age-wise distribution of neonatal mortality in Rajasthan

Why do losses occur ?

During the first few days the number of lamb losses (out of lambs born) could indicate underlying problems associated with multifarious factors like colostrum intake, hygiene issues, severity of climate, health problems or other managerial issues. However, mortality after neonatal phase is more likely to be related with health problems.




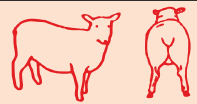
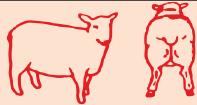
Pros and cons of indoor and outdoor lambing

Indoor		Outdoor	
Pros	Cons	Pros	Cons
Protects the flock and staff from the weather	Higher cost as more labour required	Can reduce feed and labour costs	More difficult to collect data at birth
Gives pasture a chance to recover	Higher risk of infections	Less interference for the ewes	Less supervision and more difficult to foster, if required
Increased supervision	Risk of mis-mothering	Low risk of infections	Higher losses if weather is poor

Improving output potential before lambing starts

To improve ewe and lamb survival, following non-infectious issues required to be considered before lambing:

Ewe's body condition: Ensuring ewes are on target weight at various stages of the production cycle reflects they are fit and robust, which will reduce lamb losses. Stress can increase losses, especially during early and mid-pregnancy, so handle ewes quietly. Prolonged cold weather or limited grazing can also stress ewes at this critical time and cause embryo death.

Score		Description	Category
1		Angular and narrow appearance, hollow behind ribs, neck bones prominent, sharp spine, shallow back muscle, tail feels bony	Poor (Lean)
2		Backbone raised but smooth, full back muscle, no fat, ribs are easily felt, thin neck, sharp spine, tail bones easily detectable	
3		Backbone slightly raised, ribs smooth, spine can be felt, full back muscle, some fat cover, tail bones barely detectable	Good
4		Well rounded appearance, ribs are covered, spine barely felt, muscle very full, thick fat cover, tail firm and rounded	Fat
5		Very well rounded appearance, ribs can not be felt, very thick fat cover, spine impossible to feel, fat deposits over tail and hump	

Nutrition: The size of the lamb (either too big or too small) can be the reason for a loss. This problem can be reduced through careful pre-lambing feeding and supplementation to ewes. Pay special attention to ewes with multiple foetuses, which require supplementary feeding sooner than those carrying singles. It is essential to assess quality and quantity of available biomass in grazing area and ensure rations are balanced to stop problems arising. Over-feeding concentrates adds cost, reduces forage intake and can cause acidosis which damages the rumen lining. Under-feeding pregnant ewes can give birth to light or sickly lambs. It can also lower their milk yield, reduce lamb growth rates and increase the risk of mastitis, as hungry lambs can cause teat and udder damage.

Give lambs the best start in life

Normal lambing behaviour: Ewes exhibit certain types of behaviour when they are about to lamb, including:

- Pawing at the ground
- Alternate standing and lying

- Walking in circles
- Vocalisation / bleating

Labour is usually short and varies with litter size. The time between lambs arriving is normally about 20 minutes. Assistance should be given if labour for one lamb has lasted longer than one hour in experienced ewes and over two hours in primiparous ewes. A long labour is associated with a large sized lamb, incorrect or mal-presentation of lamb (eg. legs or head back, breach), weak or under-nourished ewes.

Assistance at lambing: Most ewes will lamb without difficulty, but it is important to observe the ewes quietly to detect any problems that do arise. If a ewe needs assistance, always have the following to hand:

- Disposable gloves
- Disinfectant like potassium permanganate
- Lubricant like liquid paraffin
- Antibiotics (injectable as well as intra-vaginal pesseries)
- Pain relief/anti-inflammatory medicines
- Fluid therapy (5% Dextrose normal saline or Ringer's lactate solution)

Major adoptable practices

A. General measures

- Age of ewe at lambing should be more than two year
- The lambing of ewes during adverse season (April to July) should be avoided
- Round the year lambing should be avoided to reduce the intricacies in management and neonatal mortality
- The status of pregnancy should be ascertained regularly and ensure care of the dam (nutritional requirements, etc.) accordingly
- In prolific genotypes, nutritional requirement of the ewe and neonatal nursing should be standardized as per the number of lambs born
- Intensive care related to Veterinary, change in feeding, environmental stress, etc. of newly introduced germplasm should be taken during adaptation phase

B. Hygienic measures at lambing pens/corrals

Poor hygiene can increase the risk of infections in lambs (such as watery mouth joint ill, navel ill) and mastitis and metritis in ewes. Strategic use of disinfectants can help to reduce the incidence of these diseases.

- Disinfection of lambing pens, lamb nursery / corrals should be done at least a week before expected lambing followed by every week with any one of the surface disinfectants like benzalkonium chloride (1-2% solution in water), phenolic or quaternary ammonium compounds as per manufacturer's recommendation



- Crutching of dam (cutting of wool for posterior portion – perineal region, hind limbs) should be done one week before expected lambing
- The after birth material (placenta, amniotic fluid, vaginal discharge, etc.) should be removed from lambing pen immediately after their expulsion
- Just after birth, lamb should be cleaned by mopping with dry cloths / cotton and dispose off used cloth / cotton properly
- Use soft grass straw as bedding material (sufficient enough to cover soil in lambing pen). The bedding material from pens / corrals should be changed every 3rd day



C. Measures before lambing

- Sudden change in feeding regime for pregnant ewes should be avoided
- Monitoring for foetal development (indirectly by body weight measurement during pregnancy) should be done regularly at monthly interval
- Dam's weight at lambing should be ≥ 30.0 kg
- Supplementary feeding should be done to ewes with < 30.0 kg body weight
- Careful feeding of ewes will ensure optimum lamb birth weights, i.e. not too small and not too large. In general, for better survival birth weight of lamb should be 10% of ewe's weight at lambing. Thus, in native sheep breeds of Rajasthan where ewe's body weight at lambing is between 30 to 40 kg, the birth weight of singleton lamb should be between 3.0 to 4.0 kg.

D. Measures during and after lambing

- Udder health and milk yield should be checked at regular intervals and necessary ameliorative measures should be taken immediately to ensure adequate milk availability to lamb
- Keep watch on mothering instinct to avoid mis-mothering losses particularly in primiparous ewes
- Special attention should be given to lambs with birth weight of ≤ 3.0 kg and those born from younger ewes

E. Activities during lambing

It is important to have lambing kit ready that might be required to optimize lamb survival. The lambing kit should contain:

- Lambing ropes, cotton, swabs, towel
- Tincture iodine solution
- Sterile needles and syringes
- Clinical thermometer
- 5 and 20% dextrose solution for injection
- Calcium borogluconate solution
- Electrolyte sachets
- Sterilizing solution / detergent for feeding bottles

- Medicines (anti-inflammatory drugs and antibiotics)
- Disinfectant for floors and surfaces
- Reliable and readily available source of hot water

Following practices should be implemented during lambing:

- Ewes and lambs should be protected from extreme weather using curtains around lambing shed/ lamb nursery. Care should be taken for proper ventilation by keeping open space on upper side (1-1.5 feet) of lambing shed / lamb nursery
- Avoid assimilation of ammonia vapours in lambing shed / lamb nursery
- Provide necessary manual assistance during birth process
- Keep skilled attendant at corral particularly during night

F. Activities just after birth

- Udder and perineal region of ewe/dam should be washed with weak potassium permanganate solution (10-15 crystals in 100 ml clean water) before suckling
- Ensure expulsion of placenta. The retained placenta and uterine debris should be removed following veterinary skills
- Taking in sufficient colostrum is vital to provide the lamb with essential immunoglobulins and to protect against clostridial and other diseases, depending on the ewe's vaccination status. Colostrum also provides energy, proteins, vitamins and minerals. It is nutritionally complete and a natural laxative.
- Make sure lambs receive colostrum (@ 50 ml/kg body weight) within the first four to six hours of life and continue to consume it during the first 24 hours of life. In 24 hours, a newborn lamb must receive the equivalent of 200 ml/kg body weight in colostrum. If extra supplies are needed, colostrum from another ewe in the flock is ideal
- Liquid paraffin (@ 5 ml / lamb) should be drenched to new born lamb on day one of age



- Navel treatment (ligation, cutting and disinfection with tincture iodine) should be done to avoid chance of septicaemia, navel ill and tetanus
- Provision of milk replacer feeding should be made in twins/ low birth weight lambs and lambs from ewes with udder problem
- Maintain hygienic level in lambing shed / lamb nursery using surface disinfectants

G. **Activities in lambing pen / nursery**

- Regular disinfection of lambing pen should be done by daily cleaning, removing the bedding straw and use of surface disinfectants at every 3rd day
- Lambs affected with enteritis should be checked for dehydration and should be treated accordingly
- Mineral licks should be kept in lamb nursery and ensure availability of green fodder
- Over-crowding of lambs should be avoided to prevent the stress and spread of infectious organisms
- The lambs should be inspected daily in the morning and evening for alertness and for earliest detection and treatment of sick lamb
- Avoid mis-mothering: Mothering ability varies, but ewes in good condition (well nourished and not disturbed during lambing) tend to be good mothers. If ewes are disturbed they may leave their newborn lambs. Young / primiparous ewes can become especially alarmed and may need to be penned to help them bond with their offspring. Helping their lambs to start suckling may make them more accepting.



Best practices

- Employ additional experienced labour
- Keep lambing pens and lamb nursery freshly bedded (clean and dry)
- Spread dry disinfectant or lime before re-bedding individual pens between ewes. Ensure walls and floors are also treated
- Offer adequate lying area in each pen (4-5 ft² during pregnancy and 6-7 ft² with lambs)
- Organize lambing equipment well in advance, including first aid kit, navel disinfection kit, milk supplementation
- Employ high hygiene standards—udder washing, removal of placenta and other exudates regularly
- Provide small group pens for ewes to mother-up, especially important for weak and fostered lambs
- Supply adequate fresh, clean water for ewes
- Ensure enough electric before power points are available
- If housing is limited give priority to older ewes, first crop ewes, ewes expecting multiple lambs and ewes with below target body condition score