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## *TECHNICAL BULLETIN No.48*

# *Control & prevention of common reproductive diseases of Sheep and Goats*



# ESGPIP

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## FORWARD

This Technical Bulletin titled “*Control & prevention of common reproductive diseases of Sheep and Goats*” is the 48<sup>th</sup> 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.

The ESGPIP, has introduced Boer goats and Dorper sheep in an effort to improve the growth performance of Ethiopian sheep and goats through cross breeding. This effort will have limited impact if reproductive losses are kept to a minimum. Problems associated with sheep and goat reproduction represent an important economic loss in terms of lost milk yield and meat production and in lower stock replacement rate.

This technical bulletin provides information for creation of awareness on the control and prevention of reproductive diseases thereby improve reproductive efficiency. The information can help development agents to assist producers about the importance of reducing the impact of reproductive diseases and how to do it. The underlying principles apply to all animal enterprises even though the presentation in the bulletin makes reference to sheep and goats.

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

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# Control & prevention of common reproductive diseases of Sheep and Goats

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## 1. Introduction

Infectious reproductive diseases of sheep and goats are one of the major herd health problems. These diseases usually manifest themselves through infertility, irregular cycling, abortions, fetal mummification and stillborn or weak offspring. Although there are several causative infectious agents responsible for reproductive diseases, non-infectious conditions such as toxicities, hereditary factors, metabolic and nutritional problems, physical factors, etc., may have a significant impact on the overall productivity of animals.

Problems associated with sheep and goat reproduction represent an important economic loss in terms of lost milk yield and meat production and in lower stock replacement rate. The major reproductive problems include abortions, stillbirths, low or no milk production, mastitis, uterine infections, delivery problems and lamb/kid mortality. Many of the above problems are associated with systemic diseases that lower the overall performance of the animal, while others specifically cause fetal mortality, abortion or male infertility. Although, there are a number of factors affecting the normal reproductive process, the infectious agents are considered to be the most important problems causing significant economic losses at the herd level. This technical bulletin gives special emphasis to the control and prevention of important infectious reproductive diseases.

## 2. Common infectious diseases affecting reproduction

### 2.1. Brucellosis:

Brucellosis in sheep and goats is caused mainly by bacteria known as *Brucella melitensis* although *Brucella abortus* may also cause clinical brucellosis. *Brucella ovis* is a cause of epididymitis of rams but it has also been associated with abortions and infertility.

Brucellosis is a disease that can also affect humans. *B. melitensis* infection causes a disease in humans (undulant or Malta fever) characterized by intermittent fever, depression, fatigue, night sweats, muscle and joint pain whereas, *B. abortus* causes a mild disease. Bone inflammation/pain is a common complication in human brucellosis.

**Source of infection:** The source of infection is the infected doe or ewe. Infected tissues include the placenta, placental fluid, uterine exudates and aborted fetuses. Inhalation is the most important route of infection in goats and sheep but infection may also be acquired through eating infected material and by penetration of the bacteria through the mucous membranes of the eye. The bacteria may persist in the uterus for about 5 months after abortion. Transmission may occur in the uterus. Communal grazing areas and water sources and poor hygiene favor the rapid spread of the disease.

Humans can be infected through handling of contaminated materials, consumption of infected meat or milk.

**Clinical signs and lesions:** Late term abortions is the principal manifestation of brucellosis. Up to 60 % of the pregnant ewes/does in the farm or herd may abort. Other features include reduced milk yield and birth of weak lambs/kids that become carriers without showing symptoms. Epididymitis, testicular inflammation, joint inflammation, swollen joints, lameness and infertility in male animals.

**Treatment & control:** Control of brucellosis is easier and more appropriate than treatment. The following measures are useful to prevent and control the disease.

- Regular testing of animals, restriction of movement of animals and personnel between herds and purchase of animals with known health and reproductive records can prevent introduction and reduce the spread of the disease
- If only one animal has aborted, it is often not because of infection while abortion of more than one animal is indicative of infection.
- Culling of affected animals in order to reduce the sources of infection is the preferred measure. Treatment is usually not undertaken.
- Pasteurization of milk is recommended in order to reduce incidence of the disease in humans
- Isolate ewes and does that have aborted for three weeks especially from other pregnant animals
- All infected materials should be disposed preferably by burying and the contaminated premises disinfected
- Clean up the place where the abortion took place and wash yourself.
- Vaccination with a live attenuated *B. melitensis* Rev 1 strain vaccine confers strong immunity but it causes abortion if used in pregnant does and ewes
- It is recommended that kid and lambs should be vaccinated at 3-8 months while adults should be vaccinated 2 months before breeding
- Check whether the animal that has aborted has fever or looks sick. If so, treat it with an antibiotic.

## **2.2. Ovine Enzootic abortion**

Ovine enzootic abortion (OEA) or Chlamydial abortion is caused by the bacterium *Chlamydophila abortus*. It typically occurs in the last 2–3 weeks of pregnancy with the appearance of stillborn lambs and inflamed placenta. Human infection may be acquired from infected products of abortion or parturition or from carelessly handled laboratory cultures of the organism.

**Clinical signs and lesions:** Infected animals show no clinical illness prior to abortion. Infected ewes shed vast numbers of infective *C. abortus* at the time of abortion or parturition, particularly in the placenta and uterine discharges

**Treatment and control :** There is no chlamydial vaccine approved for goats, but the vaccine for sheep seems to be effective. During an outbreak, aborting ewes/does should be isolated and

tetracycline given orally or injected. Ewes/does that abort due to *C. abortus* remain infected for life and shed the organism at the time of ovulation. Here again culling affected animals is the preferred measure.

### 2.3. Q Fever:

It is caused by a rickettsial infection of *Coxiella burnetii* and is a disease that affects many animals and humans. There are two known patterns of transmission:

- Ruminants can contract Q fever when grazing contaminated pastures and from tick bites
- occurs through milk, placenta, and post-partum discharges, with aerosols of each being a potential source of infection for man and other animals

**Clinical signs:** Infected animals show no symptoms of the disease until aborting or having stillborn kids in late pregnancy. Abortion storms are more common in goats and can reach up to 50% of the herd.

**Treatment and control:** There is no vaccine to prevent Q fever in goats. Feeding 200 mg/head/day of chlortetracycline in the feed for 19 days or using 20 mg/kg of long-acting oxytetracycline every 3 to 14 days should control the infection. Separation of pregnant animals from the herd and burning or burying reproductive products (placenta tissue and aborted fetuses) can greatly reduce spread of the agent. Wear gloves when helping the doe/ewe at the time of kidding or when handling aborted fetus or when doing laboratory tests.

### 2.4. Toxoplasmosis

- Toxoplasmosis is caused by the *Toxoplasma gondii* microorganism
- Cats can be carriers of *T. gondii*, oocysts excreted in cat feces are thought to be the major source of infection
- Cats often defecate and bury their feces in the hay and food storage areas of barns. Does and ewes can become infected by ingesting food or water contaminated by feces

**Clinical signs:** In pregnant does and ewes *T. gondii* can invade and multiply in the placenta and pass to the fetus causing fetal death, fetal mummification, stillbirth, or the birth of weak lambs/kids. Abortions from this microorganism occur mainly in the last trimester of pregnancy and may occur in does and ewes of all ages and in successive pregnancies. Humans can be infected by *T. gondii* through consuming meat and milk from animals with toxoplasmosis

**Treatment and control:** There is no vaccine to the disease. Sulfonamides are used to treat toxoplasmosis in goats. Clindamycin (12.5 mg/kg, IM, BID for 3 weeks) is also recommended.

Control of toxoplasmosis is based on management practices; pregnant females should not be exposed to infected cat feces.

## 2.5. *Campylobacter* (Vibriosis)

The causative agent is *Campylobacter fetus subsp. fetus* (primary agent). *C. jejuni* is common in the digestive tract of dogs; can also cause abortion in sheep. Aborted fetus, tissues and all discharges are the main source of infection. Digestive tract is probably a long-term reservoir in the aborted lamb.

**Clinical signs and lesions:** The main clinical signs associated with reproductive organ infection include abortion and stillbirth in late term pregnancy.

**Treatment and control:** Ovine vaccines are available but should be used prior to exposure. They may not protect for all strains. Antibiotics (oxytetracycline) can be taken as a prophylactic measure during pregnancy to decrease abortion loss. Avoid contamination of feed and water by aborting ewes. Remove aborting ewes, fetus, placenta, etc. from the lambing area. Persons handling aborted animals or animals that have diarrhea should wear protective gloves, and wash hands carefully after handling. Food should be well cooked to control human infections.

## 2.6. *Salmonellosis*

The manifestations of salmonellosis depend on the type of causative agent:

- *Salmonella enterica* serotype Montevideo
  - *S. montevideo* infection can result in abortions in more than 25% of a flock.
  - Abortions can occur throughout the second half of pregnancy.
  - In many cases the aborted fetuses are not found, but the first sign of the problem is the presence of a red vaginal discharge and hollow flanks in ewes.
  - When abortions occur during mid pregnancy, the fetuses are often fresh, but the placentas appear inflamed.
  - When abortions occur during later pregnancy, aborted lambs are often rotten.
  
- *Salmonella enterica* serotype Dublin
  - *S. dublin* outbreaks can also result in abortions in a high proportion of the flock.
  - *S. dublin* infection often results in systemic illness and profuse diarrhea in addition to abortion.
  - Pregnant ewes may die because of systemic disease before aborting.

### **Treatment and control:**

- **Management of salmonella abortion outbreaks:** Infection occurs several weeks before ewes abort, so by the time salmonellosis has been identified, it will probably have spread throughout the group. Nevertheless, precautions should be taken to limit the level of infection and prevent spread to other groups of animals:
  - aborted ewes should be isolated from the flock
  - products of abortion should be removed
  - hygienic precautions should be taken to avoid spread of infection on clothing or equipment to other groups of sheep
- Most biotypes of *S. montevideo* are sensitive to a wide range of antibiotics and whole flock treatment with a long acting injection of oxytetracycline is often recommended. Treatment sometimes needs to be repeated after 7 – 10 days.

### **Prevention of salmonellosis**

- There are several possible sources of infection, including contaminated feed, carrier animals, wild birds, contaminated water-courses and man. Little can be done to avoid some of these possible sources, but moving and turning over of troughs between feeds may reduce contamination by birds
- Administration of antibiotics may benefit ill animals but could be counter-productive if used for the general population of animals, due to the development of antibiotic resistance by the organism.
- **Human Effects / Prevention:** A variety of salmonella species may infect man and cause diarrhea and illness. Therefore, it is important to wear protective (rubber, latex, plastic) gloves when handling aborting or animals having diarrhea. Wash hands after handling animals. Wear coveralls while handling animals and remove before going home.

### Other reproductive organs diseases

| Disease                                    | Epidemiology                           |                                     | Laboratory Findings  |  |   |
|--|--|-------------------------------------|--|--|---|
|  | Transmission                           | Time of Abortion                    | Clinical findings  | Foetus   | Diagnosis   |
| Listeriosis<br>( <i>L. monocytogenes</i> ) | Probably ingestion & wounds in mouth.  | 3 month to term & neo-natal deaths. | Retained placenta and womb inflammation. Septicemia in some ewes           | No lesions in fetus. Organisms in stomach Septicemia in lambs                                    | Isolation. Histopathology.  |
| Rift valley fever                          | Insect born. Sporadic epidemic         | Usually late                        | Abortion and hepatitis Heavy mortality in lambs. Sick adult sheep Zoonosis | Multifocal - necrosis of liver, general petechia (blood spots), edema of gall bladder. Jaundice. | Isolation. Serology. Histopathology. Immunoperoxidase test on formalin fixed tissue |
| Wesselsbron disease                        | Insect borne (Sporadic) Endemic in RSA | Usually late                        | Sporadic epizootic abortions. Sick adult sheep                             | Jaundice. Enlarged liver, liver lesions. Petechia of the abomasum etc.                           | Isolation. Histopathology Immunoperoxidase test on formalin fixed tissue. Serology  |
| Cytoecetes (Ehrlichia) phagocytophilia.    | Tick born fever                        | 2 - 8 days after fever              | Temp 40-42 C followed by abortion. Tick infested pasture                   | Non specific. Rare mummification   | Cytology. Haematology   |

### 3. General caution & action in abortion cases

Development agents can assist producers by creating awareness, creation of contact and obtain support by reporting the case and doing the following:

- Awareness creation among the farmers related to abortion cases
  - Create awareness about abortion cases and its economic and human health importance
  - Primary precaution measures should be adopted by sheep and goat:-
    - Washing hands with soap when the farmer assist the animal in delivery time
    - Avoid any contact with aborted material
    - Collect the aborted fetus and placenta with protected hands either by using glove or if not possible use plastic shopping bags to cover the hand
    - Dispose the aborted material in safe way usually by burying
    - Clean the barn by washing and keep it to dry (abortion case)
    - Keep pregnant animals separately,
    - Advise the farmers to identify animals that have frequent abortion and cull them
    - Advise the farmers to visit the veterinary clinics in case of abortion
    - If the farmer/ his family suffer with joint pain and headache, advice him/them to go clinic
    - Advise the farmer not to keep the animal which frequently shows abortion
    - Don't try to expel the retained placenta manually
    - Milk should be boiled before using for human consumption
- Report any abortion outbreak to the nearest veterinary clinic. Never ignore abortions in sheep and goat flocks.
- In case of abortions, conduct a thorough investigation immediately.
  - Isolate the animal from the herd and keep it in a quarantine pen for further examination.
  - Consider many different causes of abortion.
  - Consult an animal health professional when you suspect infectious abortion in your herd. This might constitute a public health issue. Animal health professionals can guide you on the treatment and prevention procedure.
- Obtain diagnostic support if possible:
  - Consult the diagnostic laboratory prior to submitting your sample. The diagnostic center should be aware of the infectious agent most likely to be present in the area.
  - To facilitate the diagnosis, keep detailed records and accurately identify each aborting animal and the stage of pregnancy at which the animal aborted.
  - Fetus tissue and placenta of an aborted kid/lamb should be kept in ice until submission to the diagnostic laboratory.
  - Work with the local veterinarian to draw blood and to send serum samples from aborting ewes /does to the diagnostic laboratory for serological tests.
- Quarantine any new animals before introducing them into existing flocks.
- Certain classes of dewormers administered to pregnant does/ewes can cause abortion or stillbirths. This can be mistaken for abortions caused by infectious agents.

- Certain poisonous plants can also cause abortions in ewes/does. Identify plants in your area that can cause abortion and try to eliminate them from the pasture.
- People who assist ewes/does at lambing/kidding or collect placental or fetal waste for disposal or diagnostic evaluations should be aware of the danger of infection and are advised to wear plastic gloves.
- It is important to disinfect premises where abortions have taken place. Follow the instruction given by the producer strictly, since there are different products available in market.