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***SHEEP AND GOAT POX: Causes,
prevention and treatment***



ESGPIP

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FOREWORD

This technical bulletin titled “*SHEEP AND GOAT POX: Causes, prevention and treatment*” is the 29th in a series 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 Ethiopian sheep and goats in Ethiopia.

Sheep and Goat Pox (SGP) is a disease that results in substantial loss in the production and productivity of sheep and goats in Ethiopia. The disease is a major constraint to the introduction of exotic breeds of sheep and goats and to the development of intensive livestock production. The economic losses from Sheep and Goat pox result from decreased milk production, damage to the quality of skins and other production losses. Moreover, existence of the disease severely affects trade of animals and products resulting in loss of export earnings.

The causes, prevention and treatment of sheep and goat pox is the focus of this technical bulletin. The information presented is useful for development agents to train farmers/pastoralists and also for other users engaged in business ventures based on sheep and goat rearing.

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ESGPIP
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TABLE OF CONTENTS

FOREWORD	i
TABLE OF CONTENTS.....	ii
1. Introduction.....	1
2. The Organism.....	1
3. Geographic distribution	1
4. Morbidity and mortality.....	2
5. Transmission	2
6. Clinical Signs	2
7. Post mortem lesions	3
8. Diagnosis	4
9. Treatment	4
10. Prevention and control	4
11. The role of Kebele Development Agents in prevention and control of sheep and goat pox.....	5
12. References.....	6

SHEEP AND GOAT POX: Causes, prevention and treatment

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1. Introduction

Sheep and Goat Pox (SGP) is one of the most important diseases of sheep and goats in Ethiopia following Peste des Petits Ruminants (PPR) and Contagious Caprine Pleuropneumonia (CCPP). Sheep and Goat Pox is a highly contagious viral disease of sheep and goats. Generally the disease and associated mortality are less commonly seen in indigenous breeds in endemic areas as compared with exotic breeds. Indigenous animals are more likely to suffer from the disease in areas where it has been absent or dormant for a period of time, when intensive husbandry methods are introduced, or in association with other disease agents such as Peste des Petits Ruminants or Foot and Mouth disease. Sheep and Goat Pox is a major constraint to the introduction of exotic breeds of sheep and goats and to the development of intensive livestock production. Economic losses result from decreased milk production, damage to the quality of skins and wool, and other production losses. The skin lesions heal slowly and the scars are permanent. The existence of the disease affects trade of animals and products and can hinder efforts to improve local sheep and goats through importation of improved breeds.

2. The Organism

Sheep and Goat Pox are caused by infection by the members of the Capripox genus in the family Poxviridae. These viruses are closely related to the lumpy skin disease virus of cattle. Some forms of the virus infect only sheep or only goats; however, some forms can infect both species. The causative virus cannot be distinguished easily from each other.

3. Geographic distribution

Sheep and Goat Pox is found in parts of Africa, Asia and the Middle East. In Ethiopia, the disease is found in all regions. In 2007/2008, the Animal and Plant Health Regulatory Directorate received 893 SGP outbreak reports from all regions except Gambella, Harari and Diredawa. A total of 57,638 sheep and goats contracted the disease and 4,853,347 sheep and goats were at risk in areas where outbreaks occurred. Out of the 57,638 sick sheep and goats, 6,401 animals died. In the outbreak areas, 1, 271,484 sheep and goats that were in contact with the sick animals were vaccinated against SGP. As a prophylactic measure, an additional 650, 993 animals were vaccinated against SGP throughout the country.

The disease reporting rate in Ethiopia is only about 35-40%. The actual figures in terms of affected, vaccinated and dead animals is, therefore expected to be higher than the reported figures.

4. Morbidity and mortality

Morbidity and mortality rates vary according to breed, previous exposure to the virus, and the strain of the virus. Mild infections are common among indigenous breeds in endemic areas, but more severe disease can occur in young or stressed animals, animals suffering from other infections, or animals introduced from places where SGP is not present. Morbidity rates in indigenous breeds can be 70-90% with mortality ranging from 5-10%. Mortality and morbidity rates in newly imported animals can reach 100%.

5. Transmission

Transmission of SGP occurs by the respiratory route when there is close contact between sick and healthy animals. The disease causing organism may also enter the body through other mucous membranes or abraded skin. Intra-uterine infection can occur and in that event, lambs can be born with developed lesions.



Indirect transmission of the disease occurs by contaminated litter, fodder and other objects. Indirect transmission by insects and via mechanical vectors has been reported. The virus can remain infectious for up to six months in animal pens.




6. Clinical Signs

The incubation period varies from four to twenty-one days, but is usually one to two weeks. The disease is more severe in lambs and kids than in adult animals. Some very young lambs and kids may die before exhibiting signs of the disease.

Most affected animals become weak with no appetite. They may exhibit a high fever for a short time. Skin lesions appear as small red patches usually around the mouth, on the head, under the tail and between the legs. The centers of the patches become depressed and turn grayish in color due to necrosis. These patches form blisters that break becoming open sores that soon develop scabs. Animals often have labored breathing due to blisters inside the respiratory tract and lungs. Lesions in the mouth, nose and eyes can cause discharge and excessive salivation. Affected mucous membranes may become necrotic and ulcerate. Nodules in the intestines can cause diarrhea. Depression and emaciation may be seen in some animals. Abortions may also occur.

Lesions can take several weeks to heal, and may leave permanent scars on the skin. During healing, animals are susceptible to fly strike. Secondary bacterial infections, including pneumonia are common and death can occur at any stage of the disease. Recovery can be slow if the animal was severely affected.

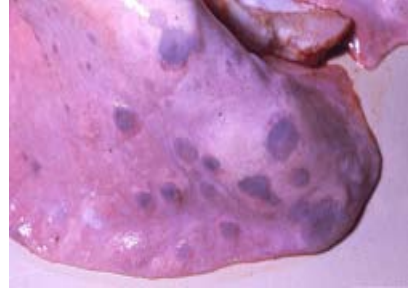

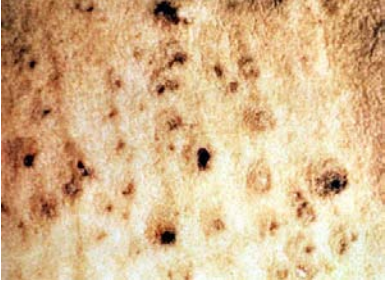
	
Figure 1 Pox lesion under the tail of a goat (source: www.cfsph.iastate.edu)	Figure 2. Goat muzzle with goat pox necrotic lesions (Source: www.cfsph.iastate.edu)

		
Note skin damage		Loss of eye sight as a result of pox
Figure 3. Sheep and goats affected by pox Photo: Dr. Muhumed - SORPARI		

7. Post mortem lesions

Upon death, the skin contains congested bloody, swollen and necrotic lesions. The mucous membranes of the eyes, nose, mouth, vulva and prepuce (foreskin of male genitals) may be necrotic or ulcerated and all the body lymph nodes are enlarged and swollen. The lungs often contain severe and extensive pox lesions.

Pox lesions are common on the abomasal mucosa, the rumen, large intestine, tongue, pharynx, trachea and esophagus. Pale areas of approximately 2 cm in diameter may occasionally be seen on the surface of the kidney and liver. Lymph nodes draining infected areas are enlarged up to eight times normal size, swollen with body fluids and may be congested and hemorrhagic.

		
Figure 4. Red brown pox lesion in the lung	Figure 5. Necrotic lesions in the skin of a goat	Figure 6. Dried necrotic sheep pox lesions on the skin of sheep

8. Diagnosis

Differential diagnoses include contagious ecthyma (orf) and bluetongue. Sheep and Goat Pox has to be suspected in animals with high body temperature with characteristic full thickness skin lesions and enlarged lymph nodes. Difficult breathing, eye inflammation, nasal discharge and other signs may also be noticed. The mortality rate is usually high in animals that are new to the outbreak area. The case history of affected animals, geographic location and the combination of clinical signs can help differentiate SGP from other diseases.

Laboratory tests to confirm the presence of SGP can be carried out at the National Animal Health Diagnostic and Investigation Center or at the nearby Regional Animal Health Laboratory.

If sheep and goat pox is suspected, kebele development agents should ensure that sick animals are isolated and inform nearby animal health personnel about the outbreak immediately so that diagnostic samples can be sent to the laboratory. For sheep and goat pox diagnosis, full skin thickness biopsies need to be taken within one week of the first appearance of lesions. If the affected animal is dead, skin lesions, lymph nodes, and lung lesions should be taken. Whole blood must be collected in heparinized tubes. Samples should be transported under refrigeration or dry ice.

9. Treatment

There is no treatment for sheep and goat pox. Antiseptic ointment can be applied to the sores of recovering animals to prevent secondary infection. Antibiotic injections may also be administered.

10. Prevention and control

Sheep and goats introduced to endemic areas should be quarantined for twenty-one days. Movement of sheep and goats from infected to non-infected areas should be restricted. Movement of products; meat, wool, hair and skin from infected areas should also be controlled. The virus may persist for up to six months in shaded, unclean shelters and for a few months in dry scabs on the skin, fleece and hair. Shelters (Barns, corrals,

pens), tools and equipment that have been in contact with infected animals must be cleaned and disinfected with disinfectants such as ether, formalin, sodium hypochlorite, 2% hydrochloric acid or phenol. It will help to remove part of the top soil and burn it.

In a sheep and goat pox outbreak, affected animals should be isolated immediately. Shelters should be cleaned and disinfected. Sheep and goats around the outbreak area should be vaccinated as soon as possible. In areas of frequent SGP occurrence,, the most effective means of controlling losses is annual vaccination. Vaccine for SGP is produced by the National Veterinary Institute.

Carcasses and contaminated materials should be buried or burned. Massive vaccination followed by cessation of vaccination and control of animal movements can be an effective strategy to control SGP if the disease has spread extensively in an area.

Quarantine of areas and premises containing infected or exposed animals is required to prevent disease spread. Infected herds and sick animals should be isolated for at least 45 days after recovery.

11.The role of Kebele Development Agents in prevention and control of sheep and goat pox

The following is a partial list of what development agents should do to control SGP:

- Learn the signs and symptoms of SGP and be able to identify diseased animals.
- Advise farmers/pastoralists to quarantine newly purchased sheep and goats for three weeks.
- Advise farmers/pastoralists to isolate animals showing signs of sheep and goat pox immediately and to move their healthy sheep and goats to other areas.
- Immediately report the outbreak to the nearest Office of Agriculture and Rural Development (OARD).
- Arrange with the OARD to vaccinate all sheep and goats that have been in contact with sick animals. Observe the vaccinated animals daily. If any animal shows signs of SGP, put it with the sick ones that have been isolated.
- Advise farmers/pastoralists to isolate infected flocks and sick animals for at least forty-five days after recovery
- Assist farmers/pastoralists in proper disposal of dead animals and animal products.
- Assist farmers/pastoralists to undertake stringent disinfection of premises.
- Assist animal health personnel in implementing animal and animal by-product movement controls.
- Arrange with the community and OARD to organize annual vaccination of sheep and goats against SGP.
- Provide regular public awareness education on the prevention and control of SGP.

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