



## SHEEP AND GOAT POX

ANIMAL GROUP AFFECTED	TRANSMISSION	CLINICAL SIGNS	FATAL DISEASE ?	TREATMENT	PREVENTION & CONTROL
Sheep and goats	Direct contact with infected animals. Indirect transmission by contaminated implements, vehicles, products or insects	Fever, depression, respiratory distress, conjunctivitis, rhinitis, cutaneous lesions	Mortality rate: endemic areas 5-10% (0-80%), although can approach 100% in imported animals	None	<i>In house</i> Isolation of affected animals  <i>in zoos</i> vaccination in endemic areas

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<b>Susceptible animal groups</b> Sheep and goats, with breed-linked predisposition (e.g. Soay, Merino, also dependent on strain of capripoxvirus)	
<b>Causative organism</b> Family Poxviridae, Subfamily Chordopoxvirinae, Genus Capripoxvirus. Virus can survive for many years in dried scabs at ambient temperatures, remains viable in wool for 2 months.	
<b>Zoonotic potential</b> None of the viruses have been associated with human disease.	
<b>Distribution</b> Middle East, Turkey, Iran, Afghanistan, Pakistan, India, Nepal, parts of people's republic of China, Bangladesh, and most parts of Africa (except southern Africa), southern Europe.	
<b>Transmission</b> <ul style="list-style-type: none"> <li>• Direct contact with infected animals (aerosol)</li> <li>• Direct contact with contaminated environment and introduction via small skin wounds</li> <li>• Indirect transmission by contaminated implement vehicles or products (litter, scabs)</li> <li>• Indirect transmission by insects (only as mechanical vectors, minor role)</li> </ul>	
<b>Incubation period</b> Incubation period is up to 21 days (4-8).	
<b>Clinical signs</b> Subclinical cases are possible especially in endemic areas. Clinical cases vary from mild to severe: fever, depression, respiratory distress, conjunctivitis, lacrimation, rhinitis, oedema of eyelids, photophobia, lymphadenopathy. Cutaneous eruptions begin with erythematous lesions especially noticeable in hair or wool-free parts of the body, the lesions evolve into papules. <ul style="list-style-type: none"> <li>• <i>Papulo-vesicular form</i> Papules become a white-grey color, desiccate and form crusts that are easy to remove. Rarely, papules may transform into vesicles. After rupture of vesicles, a thick crust covers the lesions</li> <li>• <i>Nodular form ('stone pox')</i> Papules give rise to nodules involving dermis and subcutaneous tissue.</li> </ul> In both forms, nodules develop in the lungs causing bronchopneumonia with cough, abundant nasal discharge, depression, anorexia and emaciation. Animals may recover within 20-30 days. Death is frequent when complications occur or in non endemic areas. CAVE: peracute forms (most likely in juvenile animals, also Soay sheep) can occur without cutaneous lesions!!	
<b>Post mortem findings</b> <ul style="list-style-type: none"> <li>• Skin lesions: congestion, haemorrhage, oedema, vasculitis and necrosis. All the layers of epidermis, dermis and sometimes musculature are involved</li> <li>• Lymph nodes: enlargement (up to eight times normal size), oedema, congestion, haemorrhage</li> </ul>	



- Pox lesions: on mucous membranes of the eyes, mouth, nose, pharynx, epiglottis, trachea, on the rumenal and abomasal mucosae, and on the muzzle, nares, in the vulva, prepuce, testicles, udder, and teats. Lesions may coalesce in severe cases.
- Lung lesions: severe and extensive pox lesions, focal and uniformly distributed throughout the lungs; congestion, oedema, focal areas of proliferation with necrosis, lobular atelectasis. Enlargement, congestion, oedema and haemorrhages of mediastinal lymph nodes.
- Histology: distinctive cells called "sheep-pox cells" or "cellules claveleuses" of Borrel are concentrated around blood vessels and between collagen bundles. Most of these cells contain intracytoplasmic inclusions.

**Diagnosis**

- Histopathology (especially skin and lungs)
- Electron microscopy to demonstrate virions in lesions
- Virus isolation on cell culture, identification by immunofluorescence staining, cytotoxicity and intracytoplasmic inclusion bodies
- Serology (differentiation from lumpy skin disease is not possible by serological methods!!!!):
  - Virus neutralisation
  - Indirect fluorescent antibody test
  - Agar gel immunodiffusion
  - ELISA

CAVE: Goat pox, sheep pox and lumpy skin disease are indistinguishable by conventional serology and only barely distinguishable by restriction endonuclease DNA analysis!!

**Material required for laboratory analysis**

- Full skin thickness biopsies taken within 1 week of the first appearance of the lesions
- Pulmonary lesions
- Lymph nodes
- Serum

**OIE Reference Laboratories**

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**Treatment**

None.

**Prevention and control in zoos**

- Quarantine before introduction into herds
- Euthanasia of infected animals, stringent disinfection
- (Animal and vehicle movement controls within infected areas)
- Attenuated and inactivated vaccines in endemic areas (delivered by subcutaneous or intradermal route, immunity lasts up to 2 years)

**Suggested disinfectant for housing facilities**

The virus is inactivated by phenol (2%) in 15 min, is sensitive to detergents, e.g. sodium dodecyl sulphate, and strong solutions of sodium or calcium hypochlorite (residual chlorine should exceed 5000 ppm). Susceptible to 56°C/2 hours; 65°C/30 min, highly alkaline or acid pH, and formalin (1%)

**Notification**

Council Directive 82/894 made Sheep and Goat Pox (Capripox) compulsory notifiable throughout the European Community.

**Guarantees required under EU Legislation**

Sheep and Goat Pox (Capripox) is covered by Directive 92/119. Affected animals would have to be slaughtered, and a 3 km protection zone and 10 kilometres surveillance zone set up around the infected premises. After cleansing and disinfection the restrictions would remain in force for at least 21 days, this being



the maximum incubation period of this disease.

**Guarantees required by EAZA Zoos**

**Measures required under the Animal Disease Surveillance Plan**

**Measures required for introducing animals from non-approved sources**

**Measures to be taken in case of disease outbreak or positive laboratory findings**

**Conditions for restoring disease-free status after an outbreak**

**Contacts for further information**

**References**

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