American Association of Zoo Veterinarians Infectious Disease Committee Manual 2013

LUMPY SKIN DISEASE

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<th>Animal Group(s) Affected</th>
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<td>Primarily cattle, but also African ruminants</td>
<td>Mainly via biting insects, but less frequently direct contact with infected animal. Virus may be present in semen of infected bulls for extended periods of time.</td>
<td>None to severe: fever, skin and internal nodules, enlarged lymph nodes, anorexia, rhinitis, conjunctivitis, brisket and leg edema</td>
<td>Typically, it is mild but may be severe. Most animals slowly recover but may take months. Morbidity can be 1 - 95% within a herd. Mortality rate usually low, but may be up to 25%</td>
<td>Subject to regulatory approval as infected animals outside endemic area may be destroyed. Supportive care as virus runs its course. Appropriate antibiotics for secondary bacterial infections</td>
<td>Import restrictions (mainly shipments from Africa); proper quarantine and testing of animals imported from endemic areas. Live and attenuated vaccines exist in endemic areas</td>
<td>No</td>
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Fact Sheet compiled by: Jackie Gai

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Fact Sheet Reviewed by: Carlos Romero, Anna Rovid Spickler

Susceptible animal groups: Cattle (Bos taurus). European breeds (Jersey, Guernsey, Ayrshire, Holstein, etc) of thin skin are more susceptible than zebu cattle (Bos indicus). A few cases have been reported in Asian water buffalo. Suspected clinical disease has been reported in Arabian oryx (Oryx leucocoryx) in Saudi Arabia, springbok (Antidorcas marsupialis) in Namibia, and oryx (Oryx gazelle) in South Africa. Wildlife probably not important in the epidemiology of the disease. Antibodies have been found in 6 out of 44 wildlife species tested in Africa: African buffalo (Syncerus caffer), greater kudu (Tragelaphus strepsiceros), waterbuck (Kobus ellipsiprymnus), reedbuck (Redunca arundinum), impala, springbok, and giraffe, although these may have been due to cross-reaction to similar Capripoxviral exposure. Experimental infection has been induced in sheep and goats.

Causative organism: Lumpy skin disease virus (LSDV) of cattle is classified within the genus Capripoxvirus, subfamily Chordopoxvirinae, family Poxviridae. The virus is morphologically identical to the other two known capripoxviruses; sheeppox and goatpox viruses, to which it is highly antigenically related.

Zoonotic potential: None. No evidence exists that capripoxviruses are transmitted to humans.

Distribution: Originally described in 1929 in sub-Saharan Africa and Madagascar, over the last 70 years it has spread north and south of this region. Recent outbreaks have occurred in Egypt (1988, 2006), Mauritius (2008), Vietnam, and Lebanon and Israel (2012).

Incubation period: Thought to be two to five weeks under natural conditions, but this is an estimate. Experimentally infected animals developed fever within 6-9 days and skin lesions at the inoculation site in
4-20 days. However, not all experimentally infected cattle develop clinical signs or skin lesions, indicating that there are other unknown factors involved in the pathogenesis of the disease.

**Clinical signs:** Signs may range from inapparent to severe clinical disease. Pyrexia followed by the development of multiple, painful nodules 2-5 cm in diameter over entire body, especially on head, neck, udder, perineum, and legs. Nodules involve the full thickness of the skin and may initially exude serum, developing into necrotic plugs. Rhinitis, conjunctivitis, and hypersalivation may be seen. Agalactia or marked reduction in milk yield may occur. Generalized lymphadenopathy and limb edema that makes animals reluctant to move. Pox lesions may develop on mucous membranes of mouth. Pregnant cattle may abort, and aborted fetuses may have skin nodules. Anorexia and emaciation.

**Post mortem, gross, or histologic findings:** Greyish pink skin nodules may turn into conical, necrotic plugs which penetrate the full thickness of the hide (“sit-fasts”). Flat or ulcerative lesions may be found in mucous membranes of the oral and nasal cavities, epiglottis, and trachea. Nodules may also be found in the gastrointestinal tract (especially abomasum), udder, urinary bladder, lungs, kidneys, and reproductive organs. Pleuritis and enlargement of mediastinal lymph nodes in severe cases. Enlargement of lymph nodes that drain affected areas, with lymphoid proliferation, edema, congestion, and hemorrhage. Synovitis or tendosynovitis with fibrin in synovial fluid. Temporary or permanent sterility may occur in bulls and cows.

**Diagnosis:** Confirmation of LSD in a new area requires virus isolation and identification. Biopsy or scrapes of skin lesions and nasal swabs are the most useful samples for virus isolation and rapid identification by PCR and sequencing or by staining of infected cell cultures with specific labeled antiserum. Intracytoplasmic inclusion bodies can be seen on electron microscopy. The gold standard for detecting specific antibodies to capripoxviruses is the virus neutralization test.

**Material required for laboratory analysis:** Scrapings and biopsies of skin lesions and nasal, pharyngeal and conjunctival swabs. Lymph node biopsies may be useful when there is generalized adenopathy.

**Relevant diagnostic laboratories:**

**Within the US:**

Foreign Animal Disease Diagnostic Laboratory
USDA-APHIS
40550 Route 25
Orient, NY 11957
631-323-3256

**International shipments:**

USDA
Attn: FADDL Lab Director
c/o Port Veterinarian, APHIS VS
230-59 Rockaway Blvd #101
Jamaica, NY 11413
718-553-1727

**Outside the US:**

Institute for Animal Health
Pirbright Laboratory
Ash Road
Woking, Surrey
GU24 ONF
Great Britain
# LUMPY SKIN DISEASE

**Treatment:** Subject to regulatory approval as infected animals outside endemic area may be destroyed. No specific treatment, provide supportive care. Antibiotics such as sulfonamides to prevent or control secondary infection.

**Prevention and control:** Stringent import restrictions on livestock, carcasses, hides, and semen are in place. When importing animals from endemic countries, adhere to regulatory pre-shipment and quarantine requirements. Report all suspected cases to the appropriate regulatory agency in your area immediately. The disease is mainly transmitted mechanically by biting arthropods, contrary to sheep pox and goat pox that are mainly transmitted by direct contact with infected animals. The infection may also be transmitted by contaminated semen. Animals that recover from the natural disease are immune for life. Live-attenuated sheep/goat pox vaccine (Kenya SGPV strain), as well as South African LSD live vaccine (Neethling strain) are used in cattle in endemic countries.

**Suggested disinfectant for housing facilities:** Sodium hypochlorite (2-3%), iodine compounds (1:33 dilution), Virkon® (2%), quaternary ammonium compounds.

**Notification:**
Lumpy Skin Disease is a reportable disease which must be reported immediately to the appropriate regulatory body, i.e. Department of Food and Agriculture, USDA-APHIS or State Veterinarian.

**Measures required under the Animal Disease Surveillance Plan:** Currently none.

**Measures required for introducing animals to infected areas:** None – this is a reportable disease and animals with confirmed infection outside of endemic area will be destroyed.

**Conditions for restoring disease-free status after an outbreak:** To be determined by governmental authority. Life-long immunity occurs in recovering individuals. Buffalo may serve as viral reservoirs.

**Experts who may be consulted:**
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**References:**
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