

Pasteurellosis

In 2015 220,000 saiga antelope suddenly died in Kazakhstan, decimating the Betpak-Dala saiga population with almost [90%](#) (Figure 1). The reason for this massive die-off? The bacteria *Pasteurella multocida*, which caused haemorrhagic septicaemia; an acute and highly fatal form of pasteurellosis.

Pasteurellosis, which is an acute and highly fatal bacterial disease, also occurs in Namibia. A small trigger can set off an outbreak. In this article we explain more about this infection, and what you can do to prevent an outbreak on your farm.

Bacteria

There are several types of the *Pasteurella* bacteria. The most common ones that can lead to disease are:

- 🐾 *Pasteurella multocida*
- 🐾 *Mannheimia haemolytica*

Within these bacteria there are several strains present, e.g. A, B, D, E and F, but all strains are capable of causing the disease and death. These bacteria affect not only ruminants, but potentially all species, including man. In South Africa *P. multocida* type B was responsible for multiple buffalo mortalities.

The route of infection

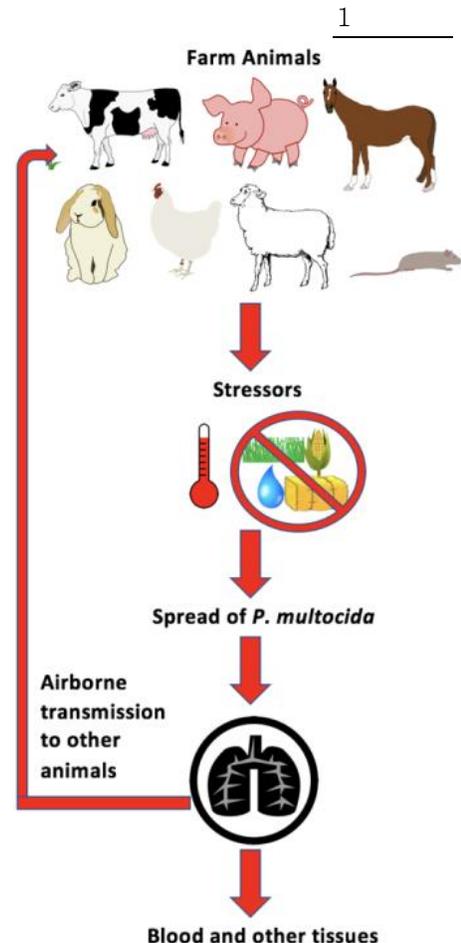
Animals usually get infected with the bacteria by inhalation or ingestion of infective material from infected animals. This can happen via aerosols (nasal discharge, coughing/sneezing), but also via saliva, urine, faeces and milk. The incubation period is between 1-8 days. Some strains may be carried in a healthy host, without inducing any symptoms.

The *Pasteurella* bacteria can only survive a few hours outside the host in dry conditions. In moist soil and animal tissues the bacteria are more persistent, and can possibly survive for a couple of days. Outbreaks of the disease can occur throughout the year, but there is a relationship with climatic conditions, husbandry practices and type of animals. The disease is seen more often in the (early) rainy season, when animals have a poorer body condition due to drought, scarcity of food and cold weather.

Figure 2 Certain Pasteurella bacteria, such as P. multocida, can become invasive and spread to the lungs when an animal is under stress. These opportunistic bacteria are then able to overwhelm the body's defence mechanism. Phagocytes (a type of white blood cell) cannot kill P. multocida since it has a protective capsule. This leads to respiratory diseases, and possible airborne spread. © Garofalo & Kalaska



Figure 1 A field of dead saigas in Kazakhstan in May 2015 Photo © Association for the Conservation of Biodiversity, Kazakhstan



Clinical signs

P. multocida, *Mannheimia haemolytica* and *Histophilus somni* naturally occur in small numbers in the bacterial flora of the upper respiratory tract. In normal circumstances the animal can keep these bacteria in check. If the natural immune system is compromised, animals can get seriously sick, and often death will follow. The first signs you probably see is the sudden death of some animals. For example, in buffalo death often occurs without the signs of any clear symptoms.

Haemorrhagic septicaemia

This form of Pasteurellosis, which caused the massive die off among the saiga antelope, is acute and highly fatal (mortality rate of nearly 100%). Animals often die a sudden death. If sick animals are noted, they may show dyspnoea (shortness of breath), fever, depression, abundant saliva and nasal discharge. The bacteria multiply in the tonsils, where it forms oedema (accumulation of fluid) and necrosis (cell injury and cell death). From there the bacteria spreads through the blood circulation.

Bronchopneumonia

The initial signs are vague, and especially in game hardly noticeable. Animals will become lethargic and stop eating. As the disease progresses, dyspnoea (shortness & difficult of breath), fever and coughing follow. Nasal discharge changes from thin and clear to thick yellow pus. Breathing becomes more and more difficult and painful.

This type of Pasteurellosis is often a problem in feedlot cattle and/or animals following stressful events (e.g. capture and transport of game in cold winter conditions), as these animals are more subjected to stress or overpopulation. Close contact facilitates the spread of the bacteria through coughing and sneezing. The *Mannheimia haemolytica* bacteria also plays an important role in the development of bovine respiratory disease (BRD).

Diagnosis

Animals showing the above-mentioned clinical signs, especially in the early rainy season, are an indicator of Pasteurellosis. However, as most animals suddenly die it is always advisable to get a vet in to perform a thorough post-mortem where suitable samples will be taken and submitted to a laboratory with the aim of identifying the disease-causing organisms. Once pasteurellosis has been diagnosed as cause, the farmer should consider vaccinating all contact animals and, if feasible, consider management options to reduce stress and disease spread, e.g. creating less crowded conditions.

In case of haemorrhagic septicaemia, the post-mortem will show small red/purple spots on the mucous membranes, the heart, lungs and kidneys due to minor capillary bleedings (petechiae and ecchymoses). Severe congestion (excessive fluid in the tissues), oedema and pneumonic signs are also seen.

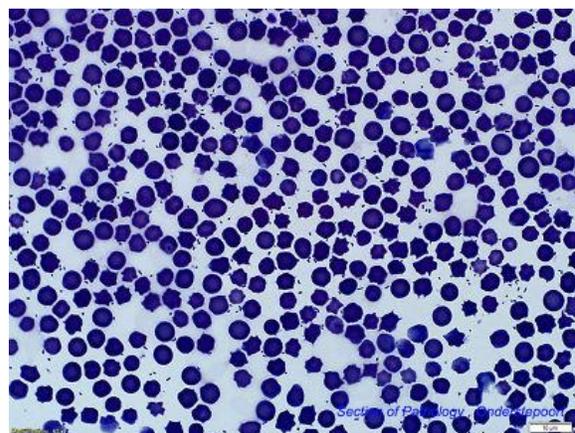


Figure 3 Blood smear from a live animal. A marked presence of bacteria in the blood can be seen. Photo: [Section of Pathology, Onderstepoort](#)

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In case of haemorrhagic septicaemia, the post-mortem will show an affected respiratory system (Figure 4; Figure 5). The lung tissue will be of greyish or purple/red colouration and the membranes of the lungs are inflamed.



Figure 4 Marked congestion (excessive fluid in the tissues) and cyanosis (bluish/purple colouration) of tissues around the trachea (windpipe) in a buffalo. The oedema is typical, and in many cases the only obvious lesion present. Photo: [Johan Steyl](#)

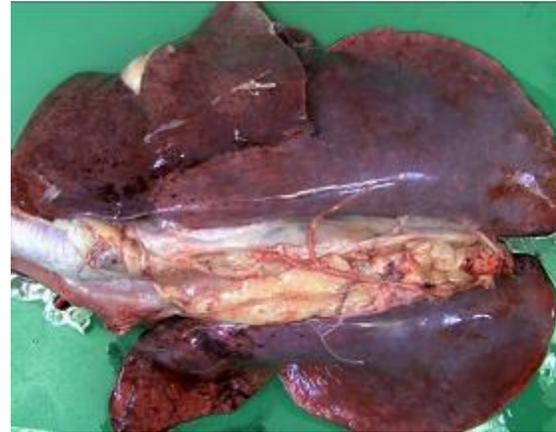


Figure 5 The lungs of this sheep are heavy, swollen and purple-red. Photo: [NADIS](#)

Treatment and Control

When animals are diagnosed with bacterial pneumonia or suspected pasteurellosis, they should immediately be placed in quarantine if possible. Antibiotic treatment should be based on veterinary recommendation and will only be effective if the treatment is initiated early and at effective dosage. Penicillin, amoxicillin, cephalosporins, florfenicol, macrolides, sulphonamides and fluoroquinolones are usually effective, but avoid the use of tetracycline-based antibiotics, as there has been considerable resistance among *P. multocida*. Reduce stress as much as possible.

To avoid pasteurellosis sound management practices are needed. This is more applicable to cattle farmers than for game farmers, but it is important to keep the following practices in mind: Avoid crowding of animals, especially during the rainy season and/or harsh winter climates. Ensure that the animals are in good body condition, and the nutrition is optimal. Avoid other stress factors such as parasites, capture, rearrangement of social hierarchy and early weaning. Game that has been captured and kept in bomas for auction purposes should be vaccinated prophylactically.

Vaccination

Vaccination of susceptible animals is the only option you have to prevent outbreaks of pasteurellosis. There are several vaccines on the market (Table 1). When an animal receives these vaccines for the first time, it would be ideal to give a booster vaccination after four weeks. This is usually not feasible in the game industry. Thereafter, an annual booster is advised. Under high risk situations/areas, it is prudent to always vaccinate animals when they are immobilized. Vaccination with drop-out darts is another possibility.

Table 1 shows you some common vaccines. The most all-round vaccine against pasteurellosis is 'Pasteurella' from Onderstepoort Biological Products, which protects against *P. multocida* and *Mannheimia Haemolytica*. The other vaccines protect well against nearly all strains of *Mannheimia haemolytica* infections, but not against *P. multocida*. The most optimal vaccine for your farm varies with other disease considerations. For example, if you only vaccinate against Pasteurella, then you may have to give another vaccine against clostridia and another against anthrax, or consider Rhinovax against latter 2 + Respiravax.

Table 1 Vaccinations against Pasteurellosis (note that this list is not complete, we listed the most common vaccines). Click on the name to see more information on that particular vaccine.

Name	Indication	Composition	Dosage
Pasteurella	Control of Pasteurella infections	<i>Pasteurella multocida</i> types A, D and E and <i>Mannheimia haemolytica</i> type 1.	2ml (for any body weight), subcutaneous ¹
Leukopast	Control of <i>Mannheimia (Pasteurella) haemolytica</i> infections	<i>Mannheimia haemolytica</i> type A 1	1ml (for any body weight), subcutaneous
Respiravax	Reducing or preventing bovine respiratory disease caused by bovine herpes virus 1 (IBRV), bovine viral diarrhoea virus type 1 (BVDV), parainfluenza virus type 3 (PI3V) and <i>Mannheimia (Pasteurella) haemolytica</i> .	BHV1 (IBR), PI3 and BVD type 1 viruses, as well as a leukotoxin-containing cell-free supernatant of <i>Mannheimia haemolytica</i>	1ml (for any body weight), subcutaneous
Multivax P	Immunisation against pulpy kidney, malignant oedema, blackquarter, tetanus and pasteurellosis.	<i>Clostridium perfringens (C. welchii)</i> type D, <i>Clostridium septicum</i> , <i>Clostridium tetani</i> , purified formalin killed cultures of <i>Clostridium chauvoei</i> and antigens from the epidemiologically most important A and T serotypes of <i>Mannheimia haemolytica</i>	2ml (for any body weight), subcutaneous
ONE-SHOT ULTRA 7	Preventing blackleg, malignant oedema, black disease, gas gangrene, enterotoxaemia and enteritis, pneumonic pasteurellosis	<i>Clostridium chauvoei</i> , <i>Clostridium septicum</i> , <i>Clostridium novyi</i> , <i>Clostridium sordellii</i> and <i>Clostridium perfringens</i> Type C and D, <i>Mannheimia haemolytica</i>	2ml cattle, 1 ml sheep, subcutaneous

¹ Under the skin