

Paratuberculosis

Susceptible Species

Paratuberculosis, also called Johne's Disease, is a chronic inflammatory intestinal disease which mainly occurs in domestic and wild ruminants and camelids. In Germany, it has so far been detected in cattle, sheep, goats, red deer, roe deer and in one donkey. Primarily young animals of up to 4 months of age are susceptible to infection.

Distribution Area

Paratuberculosis occurs worldwide and is distributed throughout Germany. The zoonotic character of this disease is discussed controversially. A possible role of MAP in the pathogenesis of Morbus Crohn (MC), a chronic inflammatory intestinal human disease, is discussed.

Causative Agent

Paratuberculosis is caused by *Mycobacterium avium* subsp. *paratuberculosis* (MAP). MAP are small, pleomorphic, straight or crescent-shaped, immobile, acid-fast rods with a length of 0.3 to 2.0 µm and a thickness of 0.3 to 0.5 µm.

Transmission

Paratuberculosis is spread by trade of apparently healthy, but infected animals. The pathogens are ingested with milk, food or water contaminated with feces. Intrauterine transmission is possible. Bacteria are mainly excreted with feces, in small amounts also with milk. In the environment the bacteria survive for several months.

Clinical Picture

Clinical symptoms occur in the final stage of disease often after an incubation period of several years and are characterized by persisting therapy-resistant diarrhea, hypodermic edema and progressing emaciation leading to cachexia. In small ruminants diarrhea is rare. Paratuberculosis is incurable and is always fatal due to malabsorption and lack of proteins. In particular in dairy cow herds, paratuberculosis often leads to considerable direct and indirect economic losses (reduced milk yield, reduced slaughtering revenues due to emaciation, increased susceptibility to diseases, loss of animals).

Diagnostics

Diagnostics of paratuberculosis is based on direct pathogen detection in fecal samples or organ material or is done indirectly by antibody detection in serum or milk. Direct pathogen detection is done by microscopic investigation (Ziehl-Neelsen staining) or cultural investigation in combination with subsequent genome detection (PCR). In animals excreting large amounts of bacteria, pathogen detection is possible by direct PCR from fecal samples. Direct pathogen detection and antibody detection show limited sensitivity. In particular in young animals (up to 2 to 3 years of age) diagnostics with this method is often insufficient. In older animals, repeated testing may increase the reliability of diagnosis. Antibody detection in blood or milk samples from single animals is suitable for assessing the status of the holding,

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also investigation of environmental samples (e.g. boot swabs). With none of the established diagnostic methods reliable estimates of disease prevalence are possible.

Similar Clinical Pictures

Diarrhea of infectious or metabolic origin, intoxications.

Control

Paratuberculosis is a notifiable animal disease. There is no therapy. Infected animals should be slaughtered as soon as possible to avoid a further spread of the pathogens. Calves in paratuberculosis-infected holdings should be kept separate from cows after birth up to an

age of approximately one year. Only colostrum from non-suspect cows should be fed. Liquid manure and dung should not be used to fertilize pastures. Young animals should not graze on pastures where previously cows or other ruminants were kept. Investigations of holdings for paratuberculosis should be carried out at regular intervals. As the most important danger arises from introduction by new animals, these should be purchased from non-suspect holdings only. See [Empfehlungen für hygienische Anforderungen an das Halten von Wiederkäuern](#) of the German Ministry of Food and Agriculture (BMEL) dd. 07 July 2014 (in German language).