



Paws are good informers of the health of rabbits (2)

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The fur density of paws and their cleanliness informs about the health of a rabbit and the environment in which it lives. Indeed, the paws are used to wash the face, the ears, to clean discharge irritating nostrils, but they are also in contact with the ground and the litter on which it lives.

The examination of paws provides reliable information on the health, hygiene and living conditions of a rabbit. Healthy and clean paws do not smell. The underside is covered with fur, with the exception of the

tiny pads at the base of the digits. The hair may be slightly worn, but should not be matted, broken or stained by feces or urine. At the base of the hair the skin should be dry and slightly pinkish. Any signs of



Figure 1: Misapprehension, this rabbit seems to suffer from a *Pseudomonas* infection, but...

inflammation and redness on the digits, hairless regions, skin that feels hot, a pain reaction when palpated, moisture or an unpleasant odor should be taken seriously. These clinical signs are indicative of bacterial or parasitic infections. They may be caused by a poor nutrition, insufficient hygiene (soiled litter) or unfavorable weather such as damp heat. Mechanical problems, e.g., a defect watering system can cause similar undesirable effects. Finally, a rabbit can get a digit or a limb caught in the door of its hutch, or while closing a door. This also causes skin lesions.

Pseudomonas aeruginosa, pyoverdin and pyocyanin

When the soil or hay is continually wetted by a defective watering system, the opportunistic pathogenic bacterium *Pseudomonas aeruginosa* may proliferate (Figure 1, 2, 3). It is an unusual host of the

skin that enjoys moisture. When the living environment is iron deficient, this bacterium will produce 2 pigments: pyoverdin and pyocyanin. These pigments boost the pathogenicity of the bacterium due to their bactericidal properties on other bacteria and will inhibit specific mechanisms in the host cells. Bacteria develop on paws that are in contact with moisture, but are also observed in skin folds of obese rabbits, in a female with a large dewlap, or in a rabbit suffering from dental problems with hypersalivation. Dermatitis caused by *Pseudomonas* sp. can be identified by the blue-green coloring of the fur or the green-blue pus that is secreted by a suppurative lesion (Figure 3).

Clinical manifestations

Clinical signs of a *Pseudomonas* infection are sufficient to confirm the diagnosis. The most commonly affected body parts are the dewlap and abdomen (Figure 3). Lesions are



Figure 2: It is the ink of a newspaper on which this rabbit hopped around, which stained the fur of his paws.



Figure 3: Rabbit suffering from a *Pseudomonas* infection, caused by a defect watering system. (Picture courtesy by Dr M. Schoenbaum)

localized and diffuse. The skin is erythematous and moist. Deep ulcers or abscesses may rarely be observed. A secondary bacterial infection is possible if the *Pseudomonas* dermatitis is not treated, with the development of cutaneous abscesses.

Diagnostic

Even when the presence of *Pseudomonas* bacteria is confirmed after staining of the fur or pus, a bacterial culture and an antibiogram are advised in order to test the susceptibility of the bacterial strain to one or more antibiotics (Figure 3). Indeed, some strains of *Pseudomonas aeruginosa* have developed a resistance to multiple antibiotics after living in the soil among other bacteria, yeasts or fungi that excrete

natural antibiotics, or in the hospital environment.

Treatment of *Pseudomonas*

The infected fur is delicately shaved and the inflamed skin is treated with an antibiotic cream. If the infection is severe, local treatment should be accompanied by an aggressive systemic antibiotic treatment.

Prevention includes a meticulous inspection of the watering system, testing the quality of drinking water, and examine the rabbit. A regular inspection of the rabbit's dentition helps detect defects of the incisors (malocclusion), the presence of molar spurs or infections in the tooth roots.

Infections with *Pseudomonas* sp. are serious and should not be neglected. Indeed, after the primary invasion of cutaneous tissues, *Pseudomonas* sp. may invade deeper tissues, enter the bloodstream and spread throughout the body and cause fatal septicemia.

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