

# INFECTION WITH *PASTEURELLA SPP.* IN A NEW ZEALAND RABBIT COLONY

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## ABSTRACT

The purpose of the research was to establish the etiology and to fight against the acute respiratory syndrome to New Zealand rabbits, of all ages to which the morbidity and mortality were high, from a farm with intensive breeding. Clinical 760 rabbits were examined, adults, young and new born raised in wire net cages in a closed stable, without draught. The necropsy examination was performed in laboratory on 57 dead rabbits with acute respiratory and also cultivations from trachea, lung, liver and spinal marrow were carried out. We used the bacterioscopic technique, cultivation on usual and selective media for *Pasteurella*, *Mycoplasma* and *Streptococcus* for isolation and identification of the micro-organisms present in the respiratory tract. Out of the 57 examined samples, 28 ones were positive and identified as *Pasteurella spp.*, of which 21 were isolated from trachea, lung and liver and 7 from spinal marrow. Seventeen samples of the 28 examined ones contained both *Pasteurella spp.* and *Mycoplasma spp.* and 11 samples *Pasteurella spp.* and *Streptococcus spp.* also isolated and identified in trachea and lung. The antibiogram test used bio-discs with penicillin, amoxicillin, gentamicin, spectinomycin, oxytetracycline, erythromycin, enrofloxacin and cefaclor. The rabbits were divided into two groups: the first group was treated with enrofloxacin for 5 days, and the second group was treated with oxytetracycline for 5 days, both administered in drinking water. One day after the beginning of the treatment the rabbits got better and the mortality stopped after the fourth day of treatment.

**Key words:** Rabbits, Acute respiratory syndrome, *Pasteurella spp.*, Antibiogram, Treatment.

## INTRODUCTION

The acute respiratory syndrome and the enteritis represent in Romania an important cause for rabbits morbidity and mortality in farms with intensive breeding and also in individual breeding, especially in spring and autumn (Rebreanu, 1983). Frequently, in rabbits breeding farms appear respiratory disturbances caused by Gram negative bacteria such as *Pasteurella spp.*, alone or/and in association with Gram positive bacteria (*Streptococcus sp.*) or with *Mycoplasma sp.* (Di Giacomo *et al.*, 1983). In the same time with the respiratory syndrome, digestive disturbances could develop (Potecea, 2002). The isolations and the identification of these bacteria do not put special problems for a laboratory with a medium endowment (Popa, 2004) and thanks to antibiogram tests, suitable substances for treatment can be selected (Turcu, 2007).

Researches were made to establish the diagnosis and to carry out the efficient measures in prevention and control.

## MATERIALS AND METHODS

In a farm with 1950 New Zealand rabbits, fattening rabbits, suckling rabbits and adults which weighted 3-4 kg, the acute respiratory syndrome started. The breeding system was conventional with

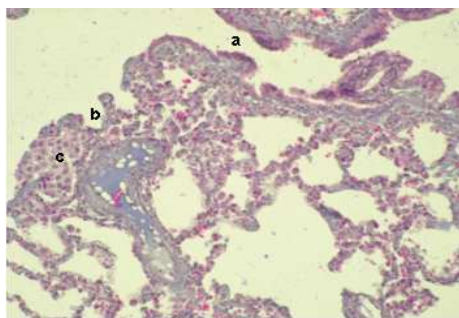
manual food administration, automatic drinking water and manual cleaning of the cages. The clinical signs were rhinitis, sinusitis, chemosis, swollen eyelids, epiphora, anorexia and lethargy. In two days morbidity was 80% and mortality 30%. Nasal pads were taken from 30 rabbits with acute respiratory syndrome. Necropsy examination was performed on 57 dead rabbits and cultivation from trachea, lung and spinal marrow were made on usual and selective culture for *Pasteurella*, *Mycoplasma* and *Streptococcus* (Palmer *et al.*, 2005). We used the bacterioscopic technique, cultivation on usual and selective media for *Pasteurella*, *Mycoplasma* and *Streptococcus* nutrient broth enriched with horse serum, (PPLO Difco), nutrient broth enriched with ram blood for the isolation and identification of the micro-organism present in the respiratory tract (Holt *et al.*, 1994). Histopathological tests from lung, heart, spleen and liver were also made. For the antibiogram test we used 24 hour microbial culture and Bayer bio-discs with penicillin, amoxicillin, gentamicin, spectinomycin, oxytetracycline, erythromycin, enrofloxacin and cefaclor (Rapuntean *et al.*, 2005).

The isolated pathogenic strains were sensitive to oxytetracycline and enrofloxacin. A batch of 527 rabbits was treated with oxytetracycline (10% oral solution 2 ml/10 kg body weight for 5 days) and to other batch of 564 rabbits was treated with enrofloxacin (10% oral solution, 1 ml/10 kg body weight for 5 days), both administered in drinking water.

## RESULTS AND DISCUSSION

The epidemiological examination indicates that there was a change in feeding and caring conditions. The acute respiratory syndrome started in a rainy week due to the fact that the stable had natural ventilation. In the same time, for three days, just a half of farms personal worked. In most cases the sick rabbits presented severe respiratory disturbances like rhinitis, sinusitis, nasal exudates and dyspnea. Some of rabbits had otitis and subcutaneous abscesses.

In 2 days the mortality increased to 30%. In the necropsy examination carried out on rabbits with respiratory disturbance, the congestion and hemorrhage in the anterior respiratory way and serosa pericarditis were observed. In the lung, consolidation, atelectasia and abscesses were observed. In the trachea, fibrinopurulent exudates were observed. Some of the rabbits showed fibrinopurulent pleuritis and pericarditis. Acute hepatic necrosis and splenomegalia was seen in association with bronchopneumonia. Exudatives bronchitis with macrophage alveolar afflux (Figure 1) and fibrinonecrotic bronchitis were observed in the histopathological exams carried out from the lung. Severe granular dystrophies on big area, in the liver, were observed.

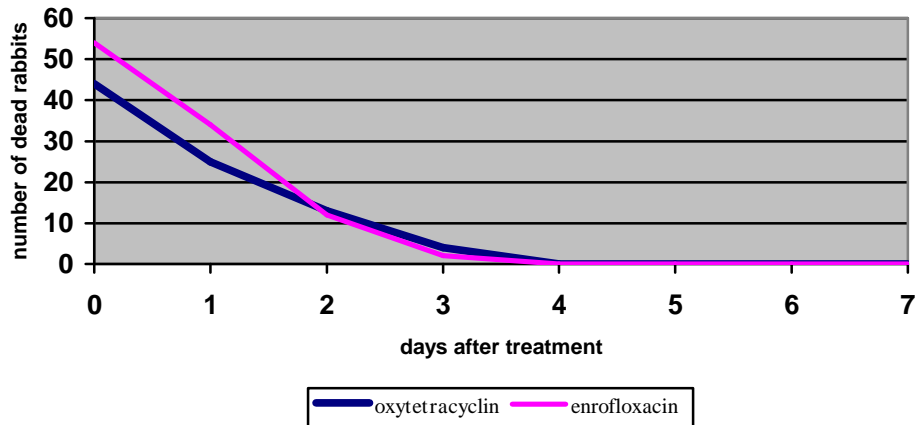


**Figure 1:** Rabbits lung; desquamative bronchopneumonia; Mallory tricromic staining; 10x. a – respiratory bronchioles; b – respiratory alveoli; c – exudates with alveolar macrophage

From those 30 nasal pads harvested from live rabbits, 17 (56%) samples contained *Pasteurella spp.*, 2 (7%) samples contained both *Pasteurella spp.* and *Streptococcus spp.* and 3 (10%) samples contained both *Pasteurella spp.* and *Mycoplasma spp.* From 57 samples harvested from dead rabbits, 28 (49%) were positive: 21 (75%) contained *Pasteurella spp.* isolated and identified in trachea, lung and liver and 7 (25%) in spinal marrow. In 17 (61%) of 28 samples *Pasteurella spp.* and *Mycoplasma spp.*

were isolated and identified in trachea and lung and in 11 (39%) samples *Pasteurella multocida* and *Streptococcus spp.* were also isolated and identified in trachea and lung.

As the isolated pathogenic strains were sensitive to oxytetracycline and enrofloxacin, 2 groups of 527 and 564 rabbits were treated respectively with oxytetracycline and enrofloxacin for 5 days. After one day from the beginning of the treatments the mortality decreased and after 4 days the mortality stopped (Figure 2).



**Figure 2:** Evolution of the mortality after the beginning of the treatment (D0) with oxytetracycline and enrofloxacin

As soon as one day after the beginning of the treatment 25 cases of mortality were registered in the batch treated with oxytetracycline and 35 cases in the batch treated with enrofloxacin. After 2 days of treatment another 12 cases of mortality were registered in the batch treated with oxytetracycline and 13 cases in the batch treated with enrofloxacin and after 3 days only 3 cases for oxytetracycline and 4 for enrofloxacin. After 4 days of treatment with the 2 drugs the respiratory syndrome disappeared. The animals were clinically examined after treatment for a 3 weeks period in which the animals were clinically healthy, and the mortality was in the normal technological limits. In the same time with the treatment all the deficiencies of caring were improved and the fodder ratio was well-balanced.

## CONCLUSIONS

An intense pathogenic strain of *Pasteurella spp.* was isolated from rabbits with acute respiratory syndrome. From those 30 nasal pads harvested from live rabbits, 17 (56%) samples contained *Pasteurella spp.*, 2 (7%) samples contained both *Pasteurella spp.* and *Streptococcus spp.* and 3 (10%) samples contained both *Pasteurella spp.* and *Mycoplasma spp.* The isolated strains were sensitive to oxytetracycline and enrofloxacin. After 4 days from the beginning of the treatments the mortality was stopped.

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