

# CLINICAL USE OF ORAL ANTIBIOTICS IN ZOO-HELD ARTIODACTYLAE

**BOUTS T.<sup>1</sup>, FURNISS G., FURNISS A.**

<sup>1</sup>Zoological Society London, ZSL Whipsnade Zoo, Whipsnade, Beds. LU6 2LF, UK; tim.bouts@zsl.org

The use of oral antibiotics in ruminants is limited by the detrimental effects of these drugs on the gastro-intestinal tract. However, in large herds of free ranging hoofstock it may be the only practical way to administer antibiotics. This paper describes the practical use of oral antibiotics in the face of some infectious diseases.

**Case 1.** An increase in mortality occurred in a herd of 7000 free ranging Rhim gazelles (*Gazella subgutturosa marica*) in the UAE. Post-mortem revealed ruminal bloat and generalized haemorrhagic gastro-enteritis. Laboratory diagnosis confirmed *Clostridium perfringens* (direct smears and toxins found) enterotoxaemia and coli septicaemia. As this disease process was considered multifactorial, dietary and management changes designed to reduce stress were implemented. All animals were treated with amoxicillin powder (Amoxicillin 100%®, Bloom Pharma, Egypt) at 10 mg/kg once daily for 5 days. The amoxicillin powder was mixed manually in the pellets with vegetable oil. Amoxicillin was chosen empirically for *Clostridium* and based on laboratory sensitivity for *E.coli*. Diarrhoea cases decreased during treatment and mortality went back to zero 4 days after ceasing treatment. Management changes and improvement in weather may also have contributed a great deal to the recovery of the gazelles.

**Case 2.** A group of Rhim gazelles in the UAE suffered abnormally high infant mortality and post-mortem showed all lambs had empty stomachs. An increase in female mortality 3 days later was caused by *Staphylococcus* mastitis. It was thought there may be a high incidence of subclinical mastitis in the herd affecting dams' milk production. A 5-day treatment with trimethoprim (6 mg/kg B.W.) and sulphamethoxazole (20 mg/kg B.W.) powder (Tromexin®, Invesa, Spain) was manually mixed in a reduced amount of pellets with vegetable oil. Lamb mortalities decreased drastically and routine post-mortems did not show any further mastitis cases or gastro-intestinal problems. The same treatment protocol was used in a group of Sable antelope (n = 15) (*Hippotragus niger*) and Isfahan sheep (n = 250) (*Ovis gmelini isfahanica*) to effectively treat coccidiosis.

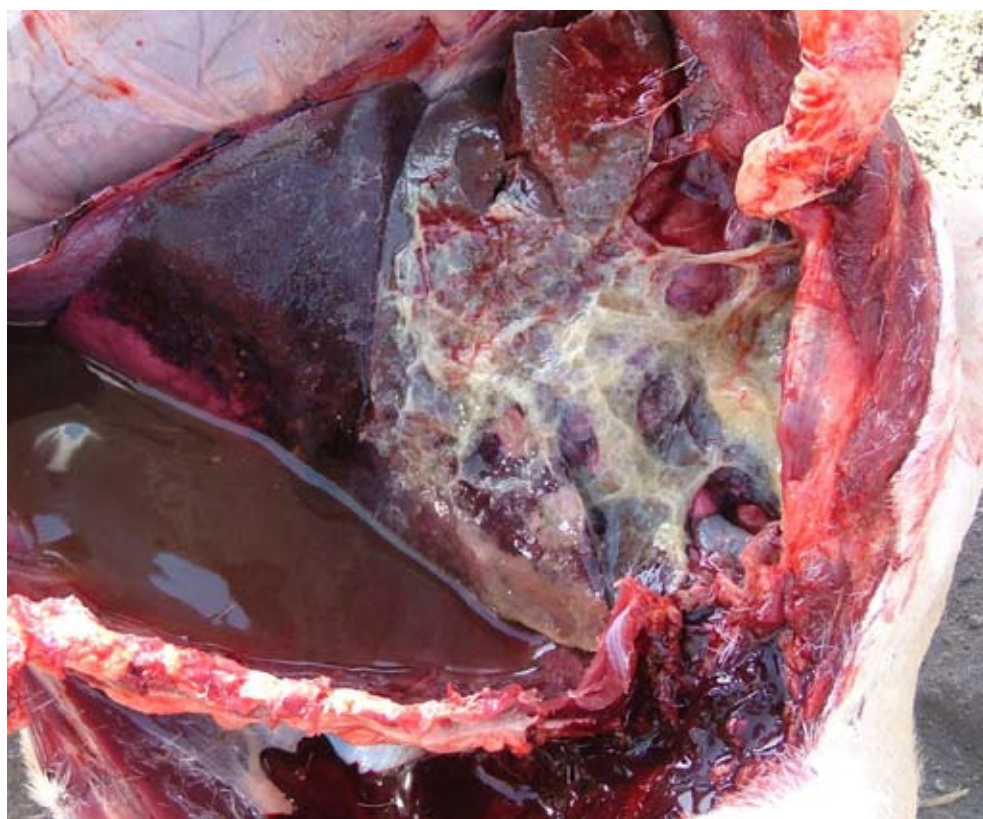


Figure 1. Thoracic cavity of a rhim gazelle with contagious caprine pleuro-pneumonia showing hepatisation of the lung, red brown fluid in the thoracic cavity and the severe fibrinous pleuritis (©Tim Bouts).

**Case 3** A group of rhim gazelles (n=10000) and 3,000 dumani gazelles (*Gazella gazella cora*) in the UAE showed sudden increased mortality with acute respiratory signs. Post-mortem revealed hepatisation of the lungs, red brown pleural fluid and severe fibrinous pleuritis (Figure 1). Contagious Caprine Pleuro Pneumonia (CCPP) was confirmed by laboratory testing. Treatment of CCPP can lead to carrier animals so the authors were reluctant to treat but the high mortalities and the lack of other control measures at the time, like vaccination, prompted treatment. Enrofloxacin solution (Enrofloxacin 10%®, Science laboratories, Iran) (15 mg/kg B.W.) was started orally in drinking water for 5 days. Mortality only dropped temporarily after treatment so was changed to doxycycline powder (Doxycyclin 50%®, Al Effat trading, Egypt) (10 mg/kg) once daily for 7 days mixed in the pellets. Doxycycline was chosen based on the reported use of the drug in ruminants at San Diego Zoo (Sudderland, 2007, unpublished data). Furthermore, doxycycline is used in fowl for Mycoplasma treatment. There was again a temporary improvement. No gastro-intestinal problems were recorded. A combination of doxycycline powder (Doxycyclin 50%®, Al Effat trading, Egypt) (10 mg/kg B.W.) and tylosin powder (Tylosin 100%®, Bloom pharma, Egypt) (10 mg/kg) was given in feed once daily for 14 days. The tylosin was added, solely based on its action against Mycoplasma. Mortalities dropped within 24 hours and were acceptable on the third day of treatment.

## Results and discussion

In all cases oral medication was the only possible treatment method because of the large enclosures and herd size. Food treatment was preferable to water treatment as the dosage could be calculated more easily and feed uptake was easier to monitor. Also, desert species do not drink large amounts of water. In two out of three cases, the antibiotics had a beneficial effect on the herd health, while in one case, the management changes might have been more important than the actual antibiotic treatment. Furthermore, all antibiotics used had no or minimal gastro-intestinal side effects. The authors feel that oral antibiotics at the dosages used in these cases could be a safe alternative for treating large herds of ruminants in zoos and wildlife parks. However, since there is always a risk involved in giving oral antibiotics to ruminants, it is recommended that laboratory confirmation of the disease agent and sensitivity testing should be carried out prior to selection of therapeutic agent.