Inactivation of antibiotics in the water pipe system and remaining stock solution during oral medication by the water hygiene biozide Virbac Clean Pipe (VCP)

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Introduction and objectives

Field data have shown that antibiotics of last oral water medication periods stay over 6-8 weeks in the drinking water system (depends from the molecule). Otherwise there are still some remaining stock solution after medication phase left (depends from the medication system) which should be pharmaceutically inactivated before given to the soil. Laboratory trials with a classical water hygiene product based on Peroxides has shown no inactivation effect to different pharmaceuticals when given in a consumable concentration to the drinking water of animals.
Virbac Clean Pipe (VCP) as a special formulation of sodium hypochlorite is giving a strong oxidation power by its 19 % free Chlorine. Therefore laboratory trials were set up to show the antibiotic inactivation activity.

Methodology approach

Double concentrations of common treatment solution of Doxycyclin (Pulmodox 500 mg/g, Virbac) 1000 g/1000 litre, Tiamulin (Stalimox 364,2 mg/g, Virbac) 400 g/1000 litre and Amoxicillin (Suramox 100 %, Virbac) 400 g/1000 litre were mixed 1:1 with the double concentrated Hypochlorite-Product (Virbac Clean Pipe, Virbac) 40 ml/1000 litre. After 1, 6 and 24 hours aliquots of 1 ml were kept and a logarithmic titration row where build up.
25 µl of these 1:10 solutions were given in the test tube with the test germs (PremiTest, r-biopharm) and incubated over 3 hours at 37°C according r-biopharm instructions.
An antibiotic effect was detected when the colour of the tube didn't change. Without antibiotic effect the germ growth induces a clear change from violet to yellow.

Results and conclusions

It was shown that VCP inactivated Doxycyclin and Tiamulin >99% within 6 hours. 90 % of the antibiotic effect of Amoxicillin was stopped to that time. The antibiotic activity was destroyed over 99,99 % within 24 hours for all tested antibiotics.
Therefore VCP could be used as a cleaner after each water medication period to stop the antibiotic effect. First field trials confirmed these laboratory test results. A VCP-cleaning phase let control cross-contaminations as a contribution to antibiotic resistance development prevention. Beside this VCP is reducing already resistant germs in the system by disinfection.
Remaining stock solutions should be preincubated with VCP in the medicator before given to the soil to reduce the antibiotic input.