

COMPARATIVE INVESTIGATION OF ALTERNATIVE METHODS IN DISINFECTANT TESTING ACCORDING TO THE DVG-DISINFECTANT TESTING GUIDELINES (GERMANY)

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SUMMARY

In the course of international standardization of disinfectant testing, the existing national testing directives have to be adapted or recreated. Thereby, the current methods of disinfectant testing are critically assessed. Special attention is paid to find possible alternatives to the expensive dilution methods in tubes.

Therefore, two alternative methods of qualitative suspension tests were compared in this study. The current procedure using 10 millilitre test tubes was compared to an alternative microdilution method in microtiter plates. The goal of this work was to evaluate the practicability of these two methods in a suspension test for bactericidy and fungicidy, as well as comparing of the repeatability of these methods. Moreover, the selection of the proposed alternative and additional micro-organisms were tested for their suitability and possible advantages.

In accordance to the above stated purposes, the work focused on disinfectant testing with bacteria and fungi which are relevant in animal housing. A total of four disinfectants, belonging to different chemical groups, were included.

When compared with the method in tubes the microdilution method showed advantages as it saves time and material, and it increases the number of possible realisable assays.

The analysis of the repeatability of both investigated methods of the qualitative suspension test showed that the rate of differences between the attempts was at the microdilution method 39.7% and 45.3% respectively. These differences were determined at the tube method 45.3% and 49.8% respectively. The distribution of these internal differences of both methods lay within a comparable range. The mean coefficient of inter assay variation of the tube method was 39.5%, whereas the mean coefficient of variation of the microdilution method was slightly higher with 43.2%. Only 25.8% of the determined effective disinfectant dilutions differed in the parallel accomplished direct comparison. 95.7% of differences differed in only one dilution step and were, thus, regarded as not significant. However, in 80.6% of the differences, the tube method required a higher concentration of the disinfectant for killing the test organisms. Because of these unequal distributions, it was not possible to statistically prove the equality of both methods.

In summary, the results of this study show that the alternative microdilution method appears to be as repeatable as the so far used tube method. Especially the mentioned advantages in practicability and material effort make the microdilution method to a serious alternative to the current tube method.

However, the results of the disinfectant testing with four disinfectants showed that the repeatability still present a difficulty in disinfectant testing. Missing analogy in 44.4% of the duplicates demonstrates this assumption.