

STALOSAN F - Not a chemical disinfectant, but a very good hygiene substance

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Summary

The Danish preparation "Stalosan F" was tested on the basis of guides for testing of disinfectants issued by the German Veterinary Society. "Stalosan F" is to be applied as powder, but the test method is intended only for the examination of soluble chemical disinfectants. Therefore we test also the effect of "Stalosan F" powder on contaminated wooden carriers.

"Stalosan F" has no or low bactericidal, tuberculocidal, fungicidal and virucidal effects. But there is a very strong reduction (4-5 lg) of virus titer, probably also a reduction of a number of bacteria. The decreasing effect on microbial contamination of surfaces caused by adsorption of microorganisms, the binding of water and urea on floor, the reduction of ammonium emission and a little deodorization effect qualify "Stalosan F" as a very good hygiene substance.

Keywords: disinfectant, testing of disinfectant, Stalosan F, hygiene substance

Introduction

According to reports from practice the preparation "Stalosan F" produced in Denmark (by comp. Stormøllen) shows very good effects on the animal health and environment when scattering it as a powder on animal house surfaces. The producer considers "Stalosan F" to be a disinfectant. In Germany tested disinfectants are included into an official list and by this are recommended for application if their microbicidal effect has been proved true according to the Guidelines for the Examination of Chemical Disinfectants issued by the Disinfection Commission of the German Veterinary Society (DVG, 1988)

Material and methods

"Stalosan F" is a brown-red powder which mainly consists of phosphates, Ca-, and Fe-sulphates, Perica oil and Al-silicates. It is intended for the application as powder (up to 50 g per sqm). The test method prescribed by DVG refers only to aqueous solutions of chemical disinfectants. Therefore besides the official methods for the examination of aqueous solutions a modified test procedure had to be applied to the powdery "Stalosan F".

The examination of the microbicidal effect of the preparation (pH value 3,45 up to 2,41) was performed by suspension and germ carrier tests with the following strains:

- Staphylococcus aureus (ATTC 6538)
- Enterococcus faecium (Kulmbach Str. 2)
- Proteus mirabilis (ATCC 14153)
- Pseudomonas aeruginosa (ATCC 15442)
- Mycobacterium avium (Av 56)
- Candida albicans (ATCC)

Appropriate deactivating agents were 3% Tween 80 (for gram-positive bacteria and Candida), 0,5% Na-thio-sulphate (for gram-negative germs) and 0,1% Cysteine (for Mycobacterium).

After pretests for toxicity and suspension tests had been performed the virucidal effect of 1% up to 5% dilutions of "Stalosan F" was examined by germ carrier tests (on mull and wood) with following strains:

- ECBO virus (LCR-4)
- REO virus (type 1)
- Newcastle Disease virus (Montana)
- Vaccinia virus (Orthopoxvirus commune, Elstree)

Results

In suspension (without protein) aqueous solutions (dilutions) partly show bactericidal,

tuberculocidal and fungicidal effects. But when adding a 20% cattle serum a microbicidal effect fails to appear even with high concentrations of the preparation (see Table 1).

Table 1:

Bactericidal effect of Stalosan F in suspension test (with and without protein loading, 20°C.

Test bacterium	Stalosan conc. (%)	Without serum				With serum			
		Affecting time (min)				Affecting time (min)			
		5	15	30	60	5	15	30	60
Staph. Aureus	1% phenole 0	-							
	0,5	+++							
	1	++	+	+	+	+++	+++	+++	+++
	2	++	ai.-	ai.-	ai.-	+++	+++	+++	+++
	4	ai.+	ai.-	ai.-	ai.-	+++	+++	+++	+++
	8	ai.+	ai.-	ai.-	ai.-	+++	+++	+++	++
	16	ai.+	ai.-	ai.-	ai.-	+++	++	++	+
	32	ai.+	ai.-	ai.-	ai.-	++	++	++	+
Ent. feacium	1% phenole 0	-							
	0,5	+++							
	1	++	+	+	+	+++	+++	+++	+++
	2	++	ai.+	ai.-	ai.-	+++	+++	+++	+++
	4	++	ai.-	ai.-	ai.-	+++	+++	+++	+++
	8	ai.+	ai.-	ai.-	ai.-	+++	+++	+++	+++
	16	ai.+	ai.-	ai.-	ai.-	+++	+++	+++	+++
	32	ai.-	ai.-	ai.-	ai.-	++	++	++	++
Legend:	+++ strong growth ++ middle growth + visible growth				ai.+ growth after incubation on medium ai.- no growth after incubation on medium				

It is true that "Stalosan F" dilutions show no or only a very limited cytotoxic and virus-deactivating effect but cause a clear reduction of the virus titre of about 4 up to 5 lg in the suspension tests and 1,5 up to 3 lg in the germ carrier tests (Tab.2).

Table 2:

Virucidal effect (reduction of titer) of 5% and 1% Stalosan dilutions in suspensions test.

Test virus	Stalosan Conc. (%)	Reduction of titer (log ₁₀ KID ₅₀) *				
		After different affecting times (min)				
		0	15	30	45	60
ECBO	5	6,75	3	2,92	2,92	2,83
	1	6,75	3,58	3,58	3,5	3
REO	5	6,42	2,83	3	2,83	2,58
	1	6,42	3,17	3,25	2,83	3
Vaccinia	5	7,25	3,42	3,33	3,17	3,17
	1	7,25	3,42	3,5	3,33	3,25
Newcastle Disease	5	7,67	3,67	3,58	3,42	3,42
	1	7,67	4	3,83	3,66	3,5

* mean values of 3 tests

Discussion and conclusion

1. "Stalosan F" is no chemical disinfectant according to the binding DVG standards although the aqueous solution is strongly acidic.
2. By an adsorptive bond of the pathogens to the particles of the mineral-containing powder "Stalosan F" in all probability causes a strong reduction of the number of germs (germ dilution) in suspensions and on surfaces of animal houses.
3. The combination of the germ-reducing effect with effects of absorption of moisture and the reduction of ammonia emission from the surfaces of animal houses qualifies "Stalosan F" as a highly valuable hygiene agent.

References

Guides for testing of chemical disinfectants. 1988. German Veterinary Society.
Committee "Disinfection in Veterinary Medicine." Giessen. 2nd edition.